



# United States and German Bilateral Agreement on Remediation of Hazardous Waste Sites

## Elements of Redevelopment of Contaminated Sites





# **EPA United States and German Bilateral Agreement on Remediation of Hazardous Waste Sites**

## **Elements of Redevelopment of Contaminated Sites**

**June 2000**

**Prepared for:**

**U.S. Environmental Protection Agency  
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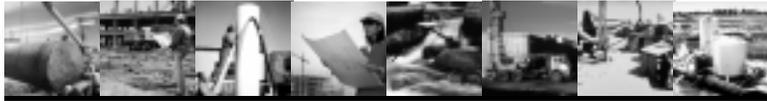
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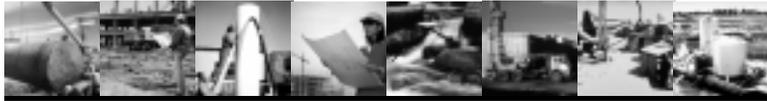
## ACRONYMS AND ABBREVIATIONS

ARAR	Applicable or Relevant and Appropriate Requirement
ARC	Appalachian Regional Commission
ASC	Accelerated Site Characterization
ASTM	American Society for Testing and Materials
BCRLF	Brownfields Cleanup Revolving Loan Fund
BMBF	German Federal Ministry of Education and Research
CAA	Clean Air Act
CCC	Cleanup Cost Cap
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CNTS	Covenant Not To Sue
CRA	Community Reinvestment Act
CWA	Clean Water Act
DETAD	German Standard Procedure for the Evaluation of Remedial Technologies
DNAPL	Dense, nonaqueous phase liquid
EI	Environmental Insurance
EPA	U.S. Environmental Protection Agency
EZ/EC	Empowerment Zone and Enterprise Community
HBGF	Housing Block Grant Funding
HRS	Hazard Ranking System
HSWA	Hazardous and Solid Waste Amendments
HUD	Department of Housing and Urban Development
IRS	Internal Revenue Service
LUST TF	Leaking Underground Storage Tank Trust Fund
MOU	Memorandum of Understanding
MSA	Major Statistical Area
NCP	National Contingency Plan
NPL	National Priorities List
NRC	National Research Council
O&F	Operational and functional
O&M	Operation and maintenance
OPA	Oil Pollution Act of 1990
OSWER	Office of Solid Waste and Emergency Response
PA/SI	Preliminary Assessment and Site Inspection
PCB	Polychlorinated biphenyl



## ACRONYMS AND ABBREVIATIONS (CONTINUED)

PL	Pollution Liability
PPA	Prospective Purchaser Agreement
PRP	Potentially Responsible Party
RBCA	Risk-based corrective action
RCRA	Resource Conservation and Recovery Act
RD/RA	Remedial Design and Remedial Assessment
REIT	Real Estate Investment Trusts
RI/FS	Remedial Investigation and Feasibility Study
ROD	Record of Decision
SACM	Superfund Accelerated Cleanup Model
SARA	Superfund Amendments and Reauthorization Act
SC	Secured Creditor
SIR	Self-Insured Retention
SITE	Superfund Innovative Technology Evaluation
SMOA	Superfund Memoranda of Agreement
SWDA	Safe Water Drinking Act
TCE	Trichloroethylene
TIF	Tax Increment Financing
TSCA	Toxic Substances Control Act
TSD	Treat, store, or dispose
UBA	German Federal Office of the Environment (Umweltbundesamt)
USDA	U.S. Department of Agriculture
UST	Underground Storage Tank
VCP	Voluntary Cleanup Program



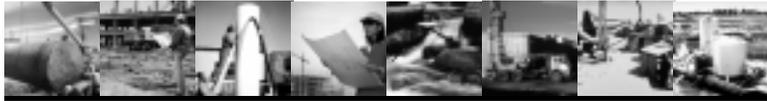
**TABLE OF CONTENTS**

<u>Section</u>	<u>Page</u>
DISCLAIMER .....	i
ACKNOWLEDGMENTS .....	ii
ACRONYMS AND ABBREVIATIONS .....	iii
1.0 INTRODUCTION .....	1
2.0 BACKGROUND .....	2
3.0 U.S. REGULATORY COMPLIANCE AND RISK MANAGEMENT CONSIDERATIONS .....	3
3.1 Regulatory Framework and Policies .....	3
3.1.1 CERCLA and Superfund Amendments and Reauthorization Act .....	3
3.1.2 National Contingency Plan .....	4
3.1.3 Hazard Ranking System and National Priorities List .....	5
3.1.4 Superfund Process Overview .....	6
3.1.5 Applicable or Relevant and Appropriate Requirements Guidance .....	7
3.1.6 Other Regulations and Permitting Requirements .....	8
3.1.6.1 RCRA .....	8
3.1.6.2 OPA .....	8
3.1.6.3 Underground Storage Tank .....	9
3.1.6.4 Permitting Requirements .....	10
3.2 Cleanup Enforcement .....	10
3.2.1 Superfund (CERCLA) Cleanup Enforcement .....	11
3.2.2 RCRA Corrective Action Enforcement .....	11
3.2.3 OPA Enforcement .....	12
3.3 Voluntary Cleanup Programs .....	12
3.4 Brownfields Economic Redevelopment Initiative .....	13
3.5 Risk Assessment and Risk Management Considerations .....	14
3.5.1 Risk Assessment Methodology .....	15
3.5.2 Risk Management Objectives .....	18
3.5.3 Risk Management Decision-Making Approaches .....	18
3.6 Cleanup Standards and Risk-Based Corrective Action .....	19
3.7 Compliance Assurance Models and Methods .....	19
3.8 Measures of Environmental and Public Health Improvement .....	20
3.8.1 Approaches to Monitoring Environmental and Public Health Improvement .....	20



**TABLE OF CONTENTS (CONTINUED)**

3.9	Sources of Information on Redevelopment .....	21
3.9.1	EPA Guidance .....	21
3.9.2	ASTM Guidance .....	24
3.9.3	Brownfields Pilots and Demonstrations .....	26
4.0	LIABILITY AND NON-REGULATORY CONSIDERATIONS .....	27
4.1	Liability .....	27
4.2	Cleanup Drivers .....	28
4.2.1	Ecological and Human Health Drivers .....	28
4.2.2	Social Drivers .....	29
4.2.3	Economic Drivers .....	29
4.2.4	Political Drivers .....	29
4.3	Future Land Use Planning and Issues .....	30
4.4	Roles of Stakeholders .....	31
4.4.1	Role of EPA .....	31
4.4.2	Role of States and Tribes .....	32
4.4.3	Role of Local Governments and Communities .....	32
4.4.4	Role of Developers .....	32
4.4.5	Role of Owners .....	34
4.4.6	Role of Financial Institutions .....	35
4.5	Financing Issues .....	36
4.5.1	Public Financing .....	36
4.5.1.1	Subsidized Low Interest Loans .....	36
4.5.1.2	Revolving Loan Funds .....	36
4.5.1.3	Bonds .....	37
4.5.1.4	Lease Arrangements .....	37
4.5.1.5	Public Ownership .....	37
4.5.1.6	Land Reclamation Banks .....	37
4.5.1.7	Indirect Strategies .....	37
4.5.2	Information and Advisory Services .....	38
4.5.2.1	Land Registry .....	38
4.5.2.2	Brokering and Facilitation .....	38
4.5.2.3	Regulatory Compliance Assistance .....	39
4.5.3	Private Financing .....	39
4.5.3.1	Revolving Funds .....	39
4.5.3.2	Trust Funds .....	39
4.5.3.3	Real Estate Investment Trust .....	39



**TABLE OF CONTENTS (CONTINUED)**

4.5.4	Grant Programs	40
4.5.4.1	EPA Brownfields Assessment Demonstration Grants	40
4.5.4.2	Brownfields Cleanup Revolving Loan Fund Pilots	41
4.5.4.3	Empowerment Zone and Enterprise Communities	41
4.5.4.4	State Grant Programs	42
4.5.4.5	Private and Nonprofit Grants	42
4.5.5	Taxes and Special Assessments	42
4.5.5.1	Tax Increment Financing	42
4.5.5.2	Real Estate Transfer Tax	43
4.5.5.3	Tax Abatements	43
4.5.5.4	Tax Initiatives	43
4.5.6	Equity Participation	45
4.5.7	Lender Issues	45
4.5.8	Investor Issues	47
4.6	Insurance Issues	49
4.6.1	Insurance Improvements	49
4.6.2	Cleanup Cost Cap Policy	50
4.6.3	Pollution Liability Policy	51
4.6.4	Secured Creditor Policy	52
4.6.5	Risk That Are Covered	53
4.7	Legal Issues	54
4.7.1	Purchase Agreements	54
4.7.1.1	Prospective Purchaser Agreements	54
4.7.1.2	Comfort Letters	55
4.7.2	Disclosure Requirements	55
4.7.3	Environmental Covenants	56
4.7.3.1	No Further Action Letter	56
4.7.3.2	Covenant Not to Sue	57
4.7.3.3	Certificate of Completion	57
4.7.4	Third Party Liability	57
4.8	Community Issues	58
4.8.1	Community Relations and Public Involvement	58
4.8.2	Environmental Justice	59
4.8.3	Political Considerations	60
4.8.4	Local Revitalization Programs	61
4.8.5	Social Stigma	61
5.0	NEXT STEPS	64
	REFERENCES	65



**TABLE OF CONTENTS (CONTINUED)**

**FIGURES**

<b><u>Figure</u></b>		<b><u>Page</u></b>
3-1	ROAD MAP TO REDEVELOPMENT .....	14
3-2	RISK ASSESSMENT/RISK MANAGEMENT PARADIGM .....	15
3-3	THE SCIENTIFIC AND TECHNICAL CONTRIBUTIONS TO RISK MANAGEMENT .....	16
3-4	RISK ASSESSMENT/MANAGEMENT DECISION PROCESS .....	17

**TABLES**

<b><u>Table</u></b>		<b><u>Page</u></b>
3-1	EPA GUIDANCE DOCUMENTS .....	21
3-2	ASTM GUIDANCE DOCUMENTS .....	25
3-3	EPA PILOT PROGRAMS .....	26
4-1	THREE BROAD LIABILITY RISK CATEGORIES .....	27
4-2	RISKS THAT ARE COVERED UNDER INSURANCE POLICIES .....	53
4-3	FACTORS OF STIGMA .....	62



## 1.0 INTRODUCTION

Redevelopment of sites contaminated with environmentally toxic or hazardous materials is a global concern that requires an integrated approach to mitigate the risks to human health and the environment. Many countries have committed extensive resources to the effort to address environmental, social, and economic issues related to the cleanup and redevelopment of hazardous waste sites. The challenge is to determine how to capitalize on the resources, expertise, and knowledge of countries that are developing solutions to those issues and effectively share and transfer that information to the organizations responsible for making decisions and implementing redevelopment actions.

The United States (U.S.) Environmental Protection Agency (EPA) and the German Federal Office of the Environment (Umweltbundesamt [UBA]) have initiated a cooperative effort to share such information and evaluate new solutions for the redevelopment of contaminated sites. The goal of this report is to describe the issues associated with the redevelopment of sites in the U.S. and to provide a foundation from which to initiate discussions between the U.S. and Germany on areas of common interest. Once this report is complete, it will be presented for discussion at a bilateral planning meeting. A second report then will be prepared that outlines the approaches and barriers associated with the issues discussed in this report as well as opportunities for innovative solutions.

To identify specific barriers to redevelopment, as well as innovative approaches or technologies to overcome those barriers, EPA intends to apply a step-by-step approach. Once new techniques are identified, EPA proposes to demonstrate those techniques or approaches through model projects at EPA pilot program sites. EPA then will share the results of the demonstration projects through publications, Web sites, and conference presentations. By using model projects to demonstrate exemplary site redevelopment approaches, EPA hopes to provide a mechanism for evaluating new approaches and technologies.

This report is divided into five sections, including this introduction. Section 2.0 presents background information about the bilateral agreement. Section 3.0 presents an overview of the policies and regulations that govern the redevelopment process. Section 4.0 presents an overview of the considerations in the redevelopment process, including the four issues that drive the cleanup process: ecological and human health drivers, social drivers, economic drivers, and political drivers. Section 5.0 discusses what future steps will be taken under the bilateral agreement.



## 2.0 BACKGROUND

In 1990, EPA and the German Federal Ministry of Education and Research (BMBF) entered into a bilateral agreement to gain a better understanding of each country's efforts in the redevelopment of hazardous waste sites and to evaluate the effectiveness of innovative technologies being applied at selected sites within each country. The overall objective of the bilateral agreement is for each country to gain a comprehensive understanding of the other's approach to the cleanup of hazardous waste sites and to evaluate the effectiveness of innovative technologies being applied at those sites. The specific goals of the bilateral agreement are to:

- Facilitate an understanding of each country's approach to the remediation of contaminated sites
- Evaluate innovative remedial technologies according to the standards of both countries
- Facilitate international exchange of technologies

The bilateral agreement is being conducted in three phases. The first two phases focused on technology issues of remediation, while the third addresses the overall redevelopment process. During Phase I, 10 technologies were evaluated at sites in the U.S. and Germany. In the U.S., technologies in use at EPA Superfund Innovative Technology Evaluation (SITE) demonstrations were evaluated; in Germany, technologies in use at full-scale remediation projects were evaluated. The technologies demonstrated during Phase I were soil washing, thermal desorption, two biological treatment technologies, in-situ radio frequency heating, vacuum distillation, catalytic oxidation, UV-oxidation, pyrolysis, and in-situ ventilation.

During Phase II, the quality management protocols of the SITE program were reviewed and used to develop a German equivalent, the German Standard Procedure for the Evaluation of Remedial Technologies (the DETAD). Both the U.S. and the German quality management protocols were then applied to five technology evaluations in the U.S. and five technology evaluations in Germany. Technologies demonstrated during Phase II were enhanced soil vapor extraction, bioremediation, reactive barriers, electroheating, surfactant-enhanced extraction, soil stabilization, and catalytic combustion. The SITE program and quality management protocols of the DETAD yielded data of known quality for the demonstrations in each country.

The bilateral agreement is currently in Phase III. The development of this report is the first U.S. product of that phase. The report is intended to establish a baseline of U.S. redevelopment issues and to facilitate the transfer of information between the two countries regarding those issues in hopes of finding mutual international solutions for common redevelopment and risk management problems.



### **3.0 U.S. REGULATORY COMPLIANCE AND RISK MANAGEMENT CONSIDERATIONS**

Years ago, people were less aware of how dumping chemical wastes might affect public health and the environment. On thousands of properties where such practices were intensive or continuous, the result was uncontrolled or abandoned hazardous waste sites, such as abandoned warehouses and landfills. The concern of citizens over the extent of the problem led Congress to establish the Superfund Program in 1980 to locate, investigate, and clean up the worst sites nationwide. EPA administers the Superfund program in cooperation with individual states and tribal governments.

In addition to the Superfund Program, EPA established the Brownfields Economic Redevelopment Initiative to empower states, communities, and other stakeholders involved in economic revitalization to work together to accomplish the redevelopment of abandoned, idled, or under-used industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination.

This section provides an overview of the framework of regulations and policies that govern the process of redeveloping contaminated sites, including: Superfund and the Brownfield Economic Redevelopment Initiative, risk assessment, and permitting requirements.

#### **3.1 Regulatory Framework and Policies**

Redevelopment of contaminated properties provides an opportunity to return abandoned, idle, or under-used land to productive use. However, the benefits must be balanced with the need to accomplish redevelopment in a manner that is protective of human health and the environment and that is in compliance with federal, state, and local environmental laws and regulations. The following subsections present a discussion of the laws and regulations that govern the human health evaluation and ecological risk assessment process.

##### **3.1.1 CERCLA and Superfund Amendments and Reauthorization Act**

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980. Congress passed CERCLA in response to the threat posed by uncontrolled releases of hazardous substances. CERCLA established a \$1.6 billion fund to clean up the worst abandoned or inactive waste sites in the nation. The fund was supported by the imposition of taxes on crude oil and commercial chemicals. Primary components of CERCLA include:

- Cleanup standards with a preference for reliable and cost-effective remedies that provide long-term protection for human health and the environment
- Prohibitions and requirements concerning closed and abandoned hazardous waste sites



- Liability of persons responsible for releases of hazardous waste at these sites
- A trust fund to provide for cleanup when no responsible party could be identified

CERCLA authorizes two kinds of response actions:

- Short-term removals where actions may be taken to address releases or threatened releases requiring prompt response.
- Long-term remedial response actions that permanently and significantly reduce the dangers associated with releases or threats of releases of hazardous substances that are serious, but not immediately life threatening. These actions can be conducted only at sites listed on EPA's National Priorities List (NPL), a list of sites identified by EPA that require priority attention.

The Superfund Amendments and Reauthorization Act (SARA) amended CERCLA on October 17, 1986. SARA significantly revised CERCLA by:

- Stressing the importance of permanent remedies and innovative treatment technologies in cleaning up hazardous waste sites
- Requiring Superfund actions to consider the standards and requirements found in other state and federal environmental laws and regulations
- Providing new enforcement authorities and settlement tools
- Increasing state involvement in every phase of the Superfund program
- Increasing the focus on human health problems posed by hazardous waste sites
- Encouraging greater citizen participation in making decisions on how sites should be cleaned up
- Increasing the size of the trust fund to \$8.5 billion

SARA also required EPA to revise the Hazard Ranking System (HRS) to ensure that it accurately assessed the relative degree of risk to human health and the environment posed by uncontrolled hazardous waste sites that may be placed on the NPL. The HRS and NPL are discussed in Section 3.1.3.

### **3.1.2 National Contingency Plan**

The National Oil and Hazardous Substances Pollution Contingency Plan, commonly referred to as the National Contingency Plan (NCP), are the regulations that set forth the procedures for implementing the Superfund program.



The first NCP was developed and published in 1968 in response to a massive oil spill from the oil tanker Torrey Canyon off the coast of England the year before. More than 37 million gallons of crude oil spilled into the water, causing massive environmental damage. To avoid the problems faced by response officials involved in this incident, U.S. officials developed a coordinated approach to cope with potential spills in U.S. waters. The 1968 plan provided the first comprehensive system of accident reporting, spill containment, and cleanup, and established a response headquarters, a national reaction team, and regional reaction teams (precursors to the current National Response Team and Regional Response Teams).

Congress has broadened the scope of the NCP over the years. As required by the Clean Water Act (CWA) of 1972, the NCP was revised the following year to include a framework for responding to hazardous substance spills as well as oil discharges. Following the passage of Superfund legislation in 1980, the NCP was broadened to cover releases at hazardous waste sites requiring emergency removal actions. Over the years, additional revisions have been made to the NCP to keep pace with the enactment of legislation. The latest revisions to the NCP were finalized in 1994 to reflect the oil spill provisions of the Oil Pollution Act (OPA) of 1990.

### **3.1.3 Hazard Ranking System and National Priorities List**

Section 105(a)(8)(B) of CERCLA, as amended by SARA, requires that the statutory criteria provided by the HRS be used to prepare a list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the U.S. The list, known as the NPL is presented in Appendix B of the NCP.

The HRS is the principal mechanism EPA uses to place uncontrolled waste sites on the NPL. It is a numerically based screening system that uses information from initial, limited investigations, the preliminary site assessment and the site inspection, to assess the relative potential of sites to pose a threat to human health or the environment. Upon completion of the HRS screening and after all comments solicited from the public about the proposed site have been addressed, a site is listed on the NPL if it exceeds a threshold number. The identification of a site for the NPL is intended primarily to guide EPA in:

- Determining which sites warrant further investigation to assess the nature and extent of the human health and environmental risks associated with a site
- Identifying what CERCLA-financed remedial actions may be appropriate
- Notifying the public of sites EPA believes warrant further investigation
- Serving notice to potentially responsible parties (PRP) that EPA may initiate CERCLA-financed remedial action



Inclusion of a site on the NPL does not require PRPs to take any action and it does not assign liability to any person. The primary purpose of the NPL is to identify for the states and the public those sites or other releases that appear to warrant remedial actions.

### **3.1.4 Superfund Process Overview**

The Superfund cleanup process begins with site discovery or notification to EPA of possible releases of hazardous substances. Sites are discovered by various parties, including citizens, state agencies, and EPA Regional offices. Once discovered, sites are entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), EPA's computerized inventory of potential hazardous substance release sites. EPA then evaluates the potential for a release of hazardous substances from the site through the following steps in the Superfund cleanup.

- Preliminary Assessment and Site Inspection (PA/SI) - The PA/SI involves the collection and review of all available information and may include an onsite inspection to evaluate the source and nature of the hazardous substances present and to identify the responsible parties. One of the main objectives of the PA/SI is to collect risk-related information so that a site can be scored using the HRS and that priorities may be set for more detailed studies. The EPA publications "Guidance for Performing Preliminary Assessments Under CERCLA," September 1991, and "Guidance for Performing Site Inspections Under CERCLA; Interim Final," September 1992, provide more information on conducting PAs and SIs, respectively.
- Remedial Investigation and Feasibility Study (RI/FS) - The RI/FS determines the nature and extent of contamination. RIs are conducted to characterize the contamination of the site and to obtain information to identify, evaluate, and select cleanup alternatives. The remedial investigation is the primary source of risk information. The FS includes an analysis of alternatives based on NCP criteria. Once cleanup alternatives are selected, the Record of Decision (ROD) is developed. The ROD is a public document that explains which cleanup alternatives will be used to clean up a site. EPA's publication "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA; Interim Final," 1988, provides a detailed structure for conducting field studies to support remedial decisions and for identifying, evaluating, and selecting remedial actions alternatives under CERCLA. The document provides detailed guidance on the RI/FS process, including project scoping, site characterization, establishment of remedial action objectives, development and screening of alternatives, and detailed analysis of alternatives.
- Operation and maintenance (O&M) - O&M activities protect the integrity of the selected remedy for a site. O&M measures are initiated after the remedy has achieved the remedial action objectives and the cleanup goals outlined in the ROD, and is determined to be operational and functional (O&F) based on state and federal agreements. For Superfund sites, remedies are considered O&F either 1 year after construction is complete or when the remedy is functioning properly and performing as designed, whichever is earlier.



Remedies requiring O&M measures include landfill caps, gas collection systems, groundwater extraction treatment, groundwater monitoring, or surface water treatment. Once the O&M period begins, the state or PRP is responsible for maintaining the effectiveness of the remedy. O&M monitoring includes the following four components:

- Inspection
  - Sampling and analysis
  - Routine maintenance
  - Reporting
- NPL Site Deletion - EPA may delete a site from the NPL if it determines that no further response is required to protect human health or the environment and that one of the following criteria has been met:
    - EPA, in conjunction with the state, has determined that responsible or other parties have implemented all appropriate response action required.
    - EPA, in consultation with the state, has determined that all appropriate Superfund-financed responses under CERCLA have been implemented and that no further response by responsible parties is appropriate.
    - A remedial investigation has shown that the release poses no significant threat to public health or the environment and, therefore, remedial measures are not appropriate.

Sites that have been deleted from the NPL remain eligible for further Superfund-financed remedial action in the unlikely event that conditions in the future warrant such action. Partial deletions can also be conducted at NPL sites.

### **3.1.5 Applicable or Relevant and Appropriate Requirements Guidance**

The "CERCLA Compliance with Other Laws Manual; Interim Final" was developed to assist in the selection of Applicable or Relevant and Appropriate Requirements (ARAR). ARARs are environmental requirements from other environmental laws, such as the Safe Drinking Water Act (SWDA), the Resource Conservation and Recovery Act (RCRA), the CWA and the Clean Air Act (CAA), that may be desirable to apply to remedial activities at contaminated sites. ARARs are part of the cleanup standards identified in CERCLA Section 121. There are three types of ARARs:

- Chemical-specific (for example, polychlorinated biphenyl [PCB] cleanup level in soil of less than 50 mg/kg)
- Action-specific (for example, if an on-site landfill is proposed, it must meet federal landfill standards)
- Location-specific (for example, prohibition of land disposal in a flood plain)



Where ARARs are not identified for a site, such levels can be established through the use of a quantitative risk assessment. The "Superfund Exposure Assessment Manual," 1988 provides specific guidance for conducting exposure assessments that satisfy the human health risk evaluation process required by CERCLA. Specifically, the manual provides an overall description of the integrated exposure assessment as it is applied to uncontrolled hazardous waste sites, and serves as a reference for the use of estimation procedures and computer modeling techniques.

### **3.1.6 Other Regulations and Permitting Requirements**

In addition to CERCLA, SARA, and the NCP, other regulations and requirements exist that govern the redevelopment process. Those regulations are discussed in the following subsections.

#### **3.1.6.1 RCRA**

To ensure that currently generated wastes are properly managed, Congress passed RCRA in 1976. Congress amended RCRA in 1984 with the Hazardous and Solid Waste Amendments (HSWA) to require the cleanup of contamination in the environment from improper waste management practices prior to the passage of RCRA and from potential future releases. HSWA requires responsible parties that are seeking to acquire a permit to treat, store, or dispose (TSD) of hazardous wastes to clean up environmental contaminants at their sites regardless of the time of the release. This cleanup at TSD facilities is termed RCRA Corrective Action.

The Corrective Action Program allows the RCRA facilities to address the investigation and cleanup of these hazardous releases themselves. The Corrective Action Program is different than Superfund because it deals with sites that have viable owners or operators and on-going operations as opposed to sites that have been abandoned or a sole responsible party cannot be identified. The Corrective Action Program encompasses active, or soon to be active facilities, that are permitted or seek to acquire a permit to treat, store, or dispose of hazardous waste. As a condition for obtaining a RCRA operating permit, these active facilities are required to clean up contaminants that are released or have been released in the past. Owners and operators of RCRA facilities must pay for the cleanup at their site.

#### **3.1.6.2 OPA**

OPA was signed into law in August 1990, largely in response to rising public concern following the Exxon Valdez incident. The OPA improved the nation's ability to prevent and respond to oil spills by establishing provisions that expand the federal government's ability, and provide the funding and resources necessary, to respond to oil spills. The OPA also created the National Oil Spill Liability Trust Fund, which is available to provide up to 1 billion dollars per spill incident.



In addition, the OPA provided new requirements for contingency planning both by government and industry. The NCP has been expanded in a three-tiered approach:

- The federal government is required to direct all public and private response efforts for certain types of spill events
- Area committees, composed of federal, state, and local government officials, must develop detailed, location-specific Area Contingency Plans
- Owners or operators of vessels and certain facilities that may pose a serious threat to the environment must prepare their own facility response plans

OPA also increased penalties for regulatory noncompliance, broadened the response and enforcement authorities of the federal government, and preserved state authority to establish laws governing oil spill prevention and response.

### **3.1.6.3 Underground Storage Tank**

An underground storage tank (UST) is a tank and any underground piping connected to the tank that has at least 10 percent of its combined volume underground. The federal regulations apply only to USTs storing either petroleum or certain hazardous substances. Regulations require owners and operators of USTs to:

- Prevent releases from USTs
- Detect releases from USTs
- Correct the problems created by releases from USTs
- Demonstrate their ability to pay for correcting the problems created if their USTs do leak

Except in a few instances, federal regulations prior to 1984 did not address UST systems. RCRA regulated only tanks containing hazardous wastes, not tanks storing petroleum or hazardous products. The CWA required owners of large underground tanks (greater than 42,000 gallons) to take certain measures to prevent corrosion and to test tanks periodically. These requirements, however, applied only to those tanks that were potentially direct sources of pollution into navigable waters. Because releases from USTs generally contaminate only groundwater, and usually affect surface water only indirectly, the CWA could not be used as a general basis for regulating most USTs.

CERCLA, or Superfund, authorized EPA to respond whenever a hazardous substance is released into the environment. Superfund, however, cannot be used to respond to releases from UST systems because petroleum is specifically excluded from the list of hazardous substances defined under CERCLA.



In 1984, RCRA was amended and Subtitle I was added to address the problems of leaking UST systems and provide regulations for UST systems.

Subtitle I includes requirements for tank notification, interim prohibition, new tank standards, reporting and record keeping requirements for existing tanks, corrective action, financial responsibility, compliance monitoring and enforcement, and approval of state programs. The law also requires EPA to develop a comprehensive program for the regulation of UST systems as may be necessary to protect human health and the environment.

In 1986, Subtitle I was amended by SARA to provide Federal funds for corrective actions on petroleum releases from UST systems. This amendment established the Leaking Underground Storage Tank Trust Fund (LUST TF).

#### **3.1.6.4 Permitting Requirements**

In addition to the regulations previously discussed, redevelopment of contaminated property is often constrained by environmental permitting related to ongoing remedial activities. Examples of permitted remediation activities include discharge of treated groundwater, disposal of contaminated soil, closure of USTs, and emissions from air strippers and soil vapor extraction systems.

In the U.S., management of permitting programs required by the CWA, CAA, and RCRA is typically delegated by the EPA to state regulatory agencies. The states can further delegate permitting and regulatory authority to municipalities. State and local regulatory programs must be at least as stringent as those prescribed by the applicable federal regulations. However, states can and often do establish more rigorous standards and requirements. This fact is important to remember when considering the feasibility and cost of redevelopment projects. A redevelopment project located in one city or state may be subjected to considerably more stringent environmental oversight than a similar project located in another city or state.

### **3.2 Cleanup Enforcement**

CERCLA, RCRA, and OPA deal with sites where there's been a migration, a release, or a threat of release of hazardous substances into the environment. Which statute applies depends on the type of release (for example, oil, or hazardous waste) and from where (for example, a UST, or an abandoned facility, or a working facility). EPA enforces its regulations by investigating the identity of, and negotiating with, parties to do the cleanup or to recover the costs of cleanup.



### 3.2.1 Superfund (CERCLA) Cleanup Enforcement

The Superfund law (CERCLA) allows EPA to respond to releases or threatened releases of hazardous substances into the environment. Under CERCLA, PRPs are held liable and therefore are expected to conduct or pay for the cleanup. A PRP can be grouped into one of the following four categories.

- Owner or operator of the facility at the time of disposal of hazardous substances
- Current owner or operator of the facility
- Entity who generated or arranged for the disposal or treatment of hazardous substances
- Transporter of the hazardous substances, if the transporter selected the disposal or treatment site

The Superfund program enforces cleanup by:

- Identifying the PRPs of the site
- Negotiating with PRPs to do the cleanup
- Recovering from PRPs the costs spent by EPA at Superfund cleanups

Superfund's liability scheme is strict, can apply to multiple PRPs, and is retroactive. The following implications of liability are:

- Strict - An entity can be held liable even if it did not act negligently or in bad faith
- Joint and several - If two or more entities are responsible for the contamination at a site and unless an entity can show that the injury or harm at the site is divisible, any one or more of the entities can be held liable for the entire cost of the cleanup
- Retroactive - An entity can be held liable even if the hazardous substance disposal occurred before CERCLA was enacted in 1980

### 3.2.2 RCRA Corrective Action Enforcement

The RCRA law regulates currently operating businesses and facilities that generate, transport, treat, store, or dispose of solid and hazardous waste. Past and present activities at RCRA facilities have sometimes resulted in releases of hazardous waste and hazardous substances into soil, groundwater, surface water, and air. The RCRA Corrective Action enforcement program:

- Requires owners and operators of RCRA facilities to conduct investigations



- Requires a thorough cleanup of the hazardous release to be conducted
- Monitors the cleanup to make sure it complies with applicable requirements

Under RCRA, Congress directed EPA to establish regulatory programs that would prevent, detect, and clean up releases from USTs containing petroleum or hazardous substances. The UST corrective action enforcement program:

- Serves as a point of contact for EPA Regional personnel on matters concerning UST corrective action enforcement
- Develops corrective action enforcement policy and guidance for the UST program

### **3.2.3 OPA Enforcement**

The OPA expanded the role of the federal government in both preventing and responding to oil spills, and in assuring that those responsible pay damages and are subject to severe penalties for such spills. The OPA site remediation enforcement program:

- Issues cleanup orders under Sections 311 (c) and (e) of the CWA
- Handles referrals to the Department of Justice under Section 311(e)
- Handles civil penalty cases alleging violations of Sections 311(c) and (e) orders

### **3.3 Voluntary Cleanup Programs**

As an alternative to the intense enforcement regulations under Superfund, states have begun to implement their own voluntary cleanup programs (VCP), which are often more responsive to cleaning up sites than the federal program. More than 35 states now have VCPs. The relationship between the authority of the states and the authority of the federal government is often complicated during VCPs. For example, an entity may be in compliance with a state VCP; however, there can still be a potential for liability under Superfund. To reduce some of the uncertainties of authority, EPA encourages its 10 regional offices to enter in to Superfund Memoranda of Agreements (SMOA) with states. The SMOAs provide the states assurances that EPA will not take regulatory actions against a site that is in compliance with a state's VCP. EPA has developed guidelines that suggest language for stating a Region's intended treatment of sites participating in a VCP program covered by a SMOA. The VCP should:

- Provide opportunities for meaningful community involvement
- Ensure that voluntary response actions are protective of human health and the environment



- Provide adequate resources to ensure that voluntary response actions are conducted in an appropriate and timely manner, and that both technical assistance and streamlined procedures, where appropriate, are available from the state agency responsible for the VCP
- Provide mechanisms for the written approval of response action plans and a certification or similar documentation indicating that the response actions are complete
- Provide adequate oversight to ensure that voluntary response actions are conducted in such a manner to assure protection of human health and the environment, as described above
- Show the capability, through enforcement or other authorities, of ensuring completion of response actions if the volunteering parties conducting the response action fail or refuse to complete the necessary response actions, including operation and maintenance or long-term monitoring activities

In addition to SMOAs, EPA is developing other methods to decrease the potential for liability of owners and developers and thereby increase the redevelopment of hazardous waste sites not on the NPL. A SMOA is one method that can help remove the barrier of potential liability for owners and developers of hazardous waste sites. However, there are other barriers to redevelopment as well as other areas in the redevelopment process that can be a potential for liability. Section 4.0 will discuss further potential liability and barriers in redevelopment.

### **3.4 Brownfields Economic Redevelopment Initiative**

The Brownfields Economic Redevelopment Initiative is one approach that EPA hopes will increase the redevelopment of hazardous waste sites. The initiative empowers states, communities, and other stakeholders involved in economic revitalization to work together to accomplish the redevelopment of abandoned, idled, or under-used industrial and commercial facilities (brownfields) where expansion or redevelopment is complicated by real or perceived environmental contamination and by potential liability for those involved in the redevelopment process.

Essential to understanding the issues of brownfields is the distinction between NPL sites that are generally the worst known contaminated sites and that have few prospects for economically viable reuse, and those sites characterized by low to medium levels of environmental contamination.

Brownfields sites can be divided into four categories:

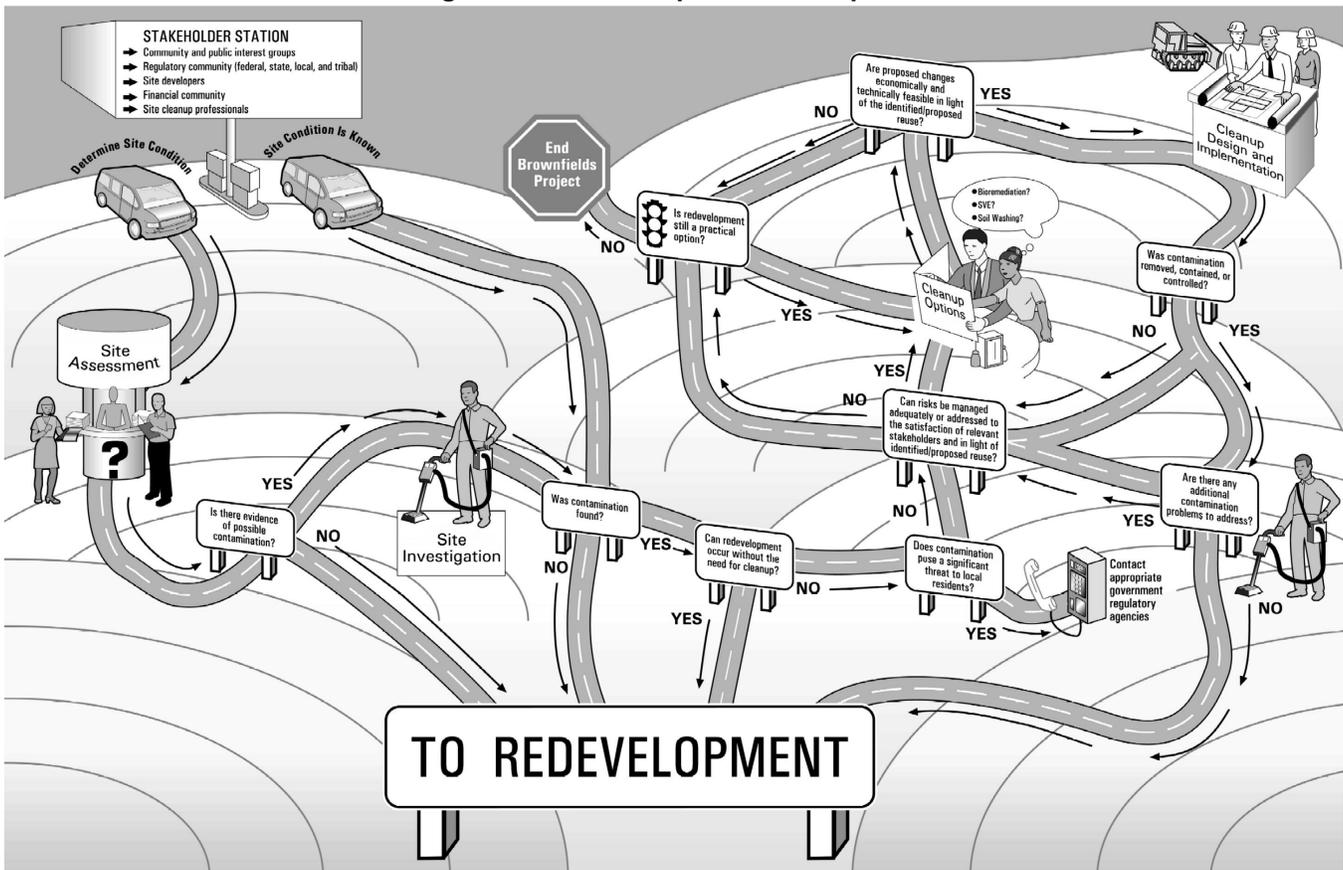
- Sites that need to be cleaned up to remain economically viable due to sufficient market demand
- Sites that have some development potential, provided financial assistance or other incentives are available
- Sites that have extremely limited market potential even after remediation



- Currently operating sites that are in danger of becoming brownfields because historical contamination will ultimately discourage new investment and lending

Many prospective purchasers, developers, and lenders have avoided getting involved with brownfield properties because of the fear that they might be held accountable in future liability under Superfund's broad liability scheme. The following diagram, Figure 3-1, Road to Redevelopment, presents the brownfields process to redevelopment.

Figure 3-1. Road Map to Redevelopment



### 3.5 Risk Assessment and Risk Management Considerations

An essential element of any redevelopment project is an investigation of the hazardous substances, pollutants, and contaminants present on the site, as well as an assessment of the risk to human health and the environment that those substances pose. In risk management, alternative cleanup actions are evaluated and a selection is made on the basis of a risk assessment. The following subsections will present a discussion of existing and emerging risk assessment and risk management methodologies.



### 3.5.1 Risk Assessment Methodology

Risk assessment is defined by the National Research Council (NRC) as "the characterization of potential adverse health effects of human exposure to environmental hazards." Quantitative risk assessment typically involves the following four processes.

- Hazard identification to examine data for all contaminants detected at a site and consolidate data to emphasize the contaminants of concern (for example, those representing the vast majority of risk posed by the site)
- Exposure assessment to identify exposure pathways, scenarios, and potentially exposed populations, and to estimate potential receptor doses
- Toxicity assessment to define dose-response relationship for each chemical of concern for both carcinogens and non-carcinogens
- Risk characterization to quantitatively estimate both the carcinogenic and non-carcinogenic risk to receptors for all exposure scenarios considered

A depiction of the processes is presented in Figure 3-2, The Risk Assessment/Risk Management Paradigm

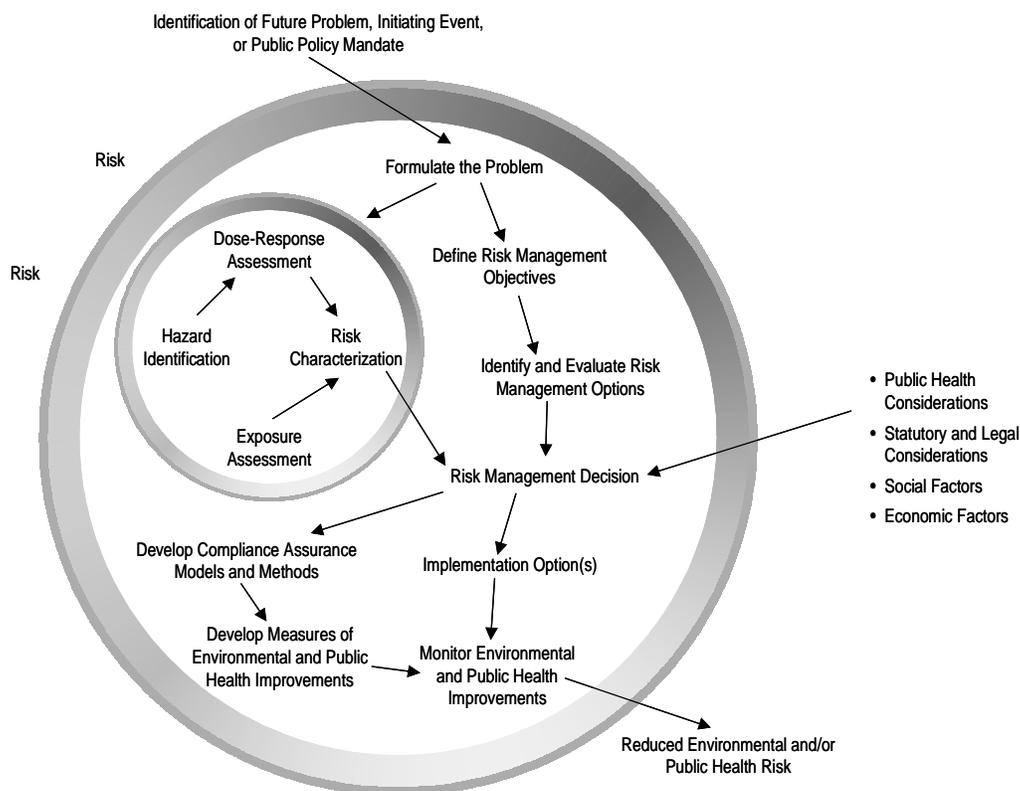
**Figure 3-2. Risk Assessment/Risk Management Paradigm**





The risk assessment process is one component of the overall process of risk management. The risk management process begins when a potential new risk comes to light and authorities decide or are mandated to respond to concern about the risk. It involves a risk assessment, as well as a series of other scientific and technical activities illustrated in Figure 3-3, The Scientific and Technical Aspects to Risk Management, to provide the scientific and technical data for making and implementing risk management decisions. The risk management process ends when the selected risk management option(s) is implemented and the resulting environmental or public health improvements are monitored.

**Figure 3-3. The Scientific and Technical Contributions to Risk Management**

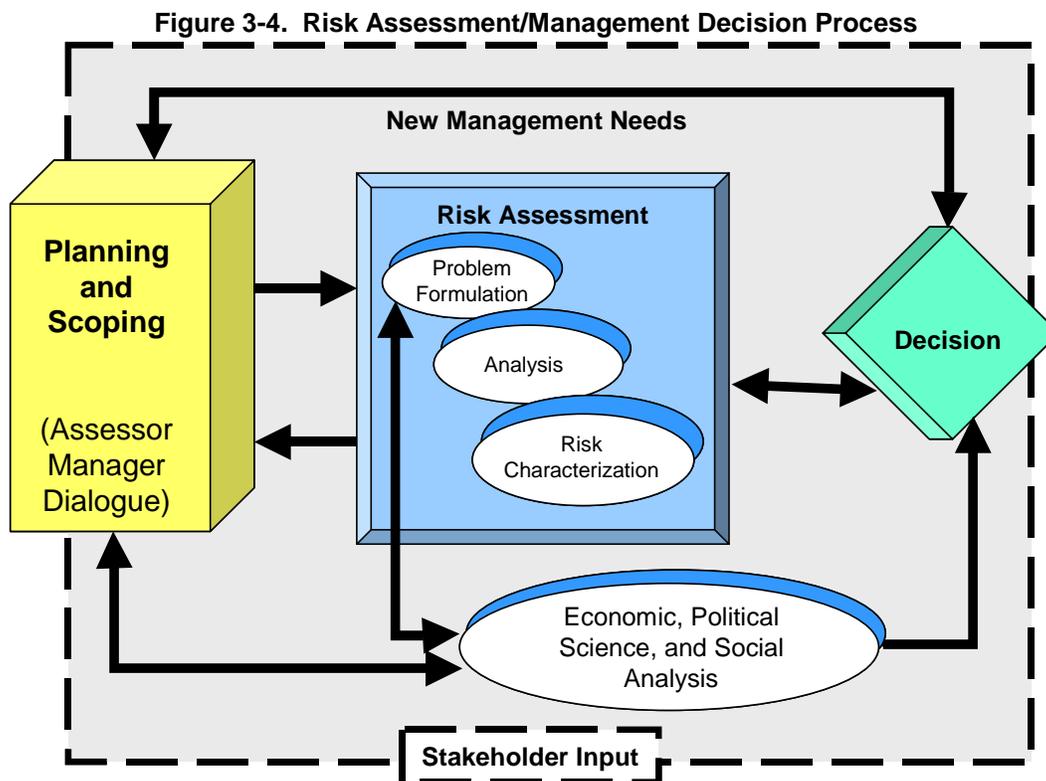


The practice of risk assessment within the EPA is evolving away from a focus on the potential of a single pollutant in one environmental medium for causing cancer toward integrated assessments involving suites of pollutants in several media that may cause a variety of adverse effects on humans, plants, animals, or even effects on ecological systems and their processes and functions.



In recent years, EPA's risk assessment emphasis has shifted increasingly to a more broadly based approach characterized by greater consideration of multiple endpoints, sources, pathways, and routes of exposure; community-based decision-making; flexibility in achieving goals; case-specific responses; a focus on all of the environmental media; and significantly, holistic reduction of risk. This more complex assessment involves cumulative risk assessment. It is defined in each case according to who or what is at risk of adverse effects, from identifiable sources and stressors, through several routes of exposure over varied time frames.

The overall approach for integrated risk assessment and management is shown in Figure 3-4. This figure shows that stakeholders (interested or affected parties) need to be involved in the process. The NRC in "Understanding Risk: Informing Decisions in a Democratic Society" and a draft report from the Commission on Risk Assessment and Risk Management recommend that all involved parties, or stakeholders, be involved throughout the process. Risk managers must decide on a case-by-case basis when and how stakeholders can be involved.





In recent years, the EPA has stressed the importance of community involvement in risk assessments and risk management decision-making. Community involvement can help to:

- Identify overlooked local knowledge - Community members may have useful information about the site's history, chemical uses, human activities, and past land uses
- Streamline efforts - Community members may have special issues or concerns that, if incorporated into a project at the outset, will reduce the likelihood of challenges to risk assessment, remediation, and redevelopment plans
- Gain acceptance - Community members who contribute to the redevelopment planning process will better understand the process and will be more likely to support the project

### **3.5.2 Risk Management Objectives**

Risk management may be defined as evaluating alternative actions and selecting among them. This entails consideration of political, social, economic, and engineering information with risk-related information to develop, analyze, and compare regulatory options, and to select the appropriate regulatory response to a potential health hazard. The selection process requires the use of value judgments on such issues as the acceptability of risk and the reasonableness of the costs of control.

The goal of the human health evaluation process is to provide a framework for developing the risk information necessary to assist decision-making at remedial sites. Specific objectives of the process are to:

- Provide an analysis of baseline risks and determine the need for action at sites
- Provide a basis for determining levels of chemicals that can remain onsite and still be adequately protective of human health
- Provide a basis for comparing the potential health impacts of various remedial alternatives
- Provide a consistent process for evaluating and documenting public health threats at sites

### **3.5.3 Risk Management Decision-Making Approaches**

Risk-based decision-making is a mechanism for identifying necessary and appropriate action throughout the cleanup process. Depending on known or anticipated risks to human health and the environment, appropriate action may include site closure, monitoring and data collection, active or passive remediation, or contaminant or institutional controls. In all cases, the objective is the same; to ensure that adequate protection of human health and the environment is provided.



The availability of options such as allowing contamination to remain in place or using institutional controls to prevent exposure will depend on a number of factors. These include the types and amounts of hazardous substances present at a site, potential exposed populations, and the calculated health risks. With regard to redevelopment of contaminated sites, risk management decision-making also evaluates potential reuse of a site.

### **3.6 Cleanup Standards and Risk-Based Corrective Action**

A major component in the risk assessment process is establishment of cleanup standards. Under Superfund, contaminated sites must meet cleanup standards or ARARs. CERCLA infers that the remedial action either eliminates or reduces contaminants to the level specified in the ARAR for each contaminant. In addition, risk-based target levels can be developed for contaminants at a site for all applicable media of concern (sometimes referred to as site-specific target levels) based on the contaminants potential to reach human receptors. Cleanup standards under Superfund do not allow alternative cleanup standards to be established on the basis of reasonable distinctions among the levels of risk at each site (such as, the severity of contamination and the probability of human or environmental exposure to the contaminant). The cost of meeting such stringent standards, can make a contaminated redevelopment site economically infeasible to developers.

The American Society for Testing and Materials (ASTM) develops standard test methods, specifications, practices, guides, classifications, and terminology in 130 areas covering subjects such as the environment and consumer products. ASTM developed a risk-based corrective action (RBCA) framework that incorporates a step approach to risk assessment in which risk levels and other variables, including exposures anticipated at the site based on expected future uses, can be used to determine sufficiently protective cleanup standards and corresponding remedial actions on a site-specific basis.

### **3.7 Compliance Assurance Models and Methods**

Several factors that have increased costs at Superfund sites include extended site assessments with duplicative sampling efforts, litigation with PRPs, and lengthy remedy selection analyses. In April 1992, EPA introduced the Superfund Accelerated Cleanup Model (SACM) to address some of these issues.

SACM streamlines the traditional Superfund response process established by Congress in CERCLA and amended by SARA, by reorganizing and restructuring various components of the process. The main goals of SACM are:

- Non-duplicative site assessment
- Prompt risk reduction
- Cross-program coordination of response planning
- Early initiation of enforcement activities
- Early public notification and participation



One important tool within SACM is the presumptive remedy approach. Since Superfund's inception in 1980, remedial and removal programs have found that certain categories of sites have similar characteristics, such as types of contaminants present, types of disposal practices, or how environmental media are affected. On the basis of information acquired from evaluating and cleaning up these sites, EPA is developing presumptive remedies to accelerate future cleanups at these sites. The objective of the presumptive remedies initiative is to use the past experience of the program to streamline site investigations, speed up selection of cleanup actions, and to ensure consistency in remedy selection and reduce the cost and time required to clean up similar types of sites.

### **3.8 Measures of Environmental and Public Health Improvement**

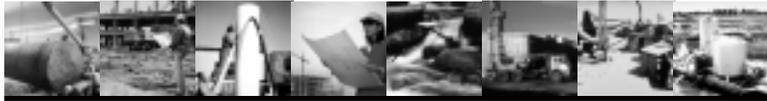
Under CERCLA, risk evaluations or reviews of certain cleanup actions must occur at least every 5 years to assure that human health and the environment are being protected by the remedial alternative implemented. These 5-year reviews are generally quantitative and focus on the following two goals:

- Confirm that the remedy remains protective
- Evaluate whether clean-up standards are still protective by considering new ARARs, new parameters for risk and hazard calculations, and other new information

#### **3.8.1 Approaches to Monitoring Environmental and Public Health Improvement**

EPA recognizes that some remedial decisions made at Superfund sites in the past should be modified to bring those decisions up to date with current knowledge about remedial actions. The best example of how knowledge and expectations have evolved in the Superfund program is the case of contaminated groundwater. At the beginning of the program, it was anticipated that groundwater contamination would migrate in a relatively simple and predictable manner, and that remediation using pumping wells coupled with above-ground treatment would be straightforward and rapid. Today, it is understood that many of the contaminants present in groundwater at Superfund sites were derived from "dense, nonaqueous phase liquids" (DNAPL) such as trichloroethylene (TCE). Such contaminants behave in a manner that was not widely understood by the technical community until the late 1980s. The migration, fate, and cleanup of DNAPL contamination in groundwater is still the subject of considerable research.

The Superfund program has evolved in response to scientific advancement and remediation experience. For example, "Guidance for the Evaluation of the Technical Impracticability of Ground water Restoration," 1993 presented the results of an EPA study of the efficacy of "pump and treat" cleanups at Superfund and other contamination sites. EPA determined that numerous challenges may be faced cleaning up contaminated groundwater, and the report presented advice on how to demonstrate that required cleanup levels should be



waived in favor of a protective, but less-stringent cleanup approach. The need for flexibility in the implementation of groundwater remedies is discussed in detail in the EPA guidance "Presumptive Response Strategy and Ex-Situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites," 1996.

Modification of cleanup actions is not a new concept in Superfund. However, the need to modify actions to stay current with new technologies has grown as the complexity of Superfund cleanups has become more apparent and national concern regarding the costs of such cleanups has increased.

### 3.9 Sources of Information on Redevelopment

Described in this section are resources for information about redevelopment of hazardous waste sites, including: guidance developed by EPA, standards developed by the ASTM, and brownfields pilot programs and demonstrations. Included in the discussions are lists of documents relevant to redevelopment.

#### 3.9.1 EPA Guidance

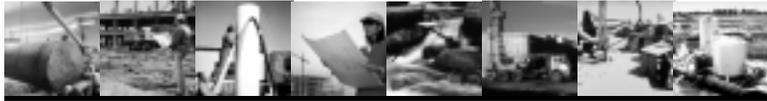
EPA has developed many tools and resources that can help in the redevelopment process, including information about: beginning a redevelopment project, assessing a site, investigating a site, cleanup options, cleanup design and implementation, incentives, and regulations. In addition, many states and other stakeholders also have developed useful materials. A list of some of the policies and documents developed by EPA is presented in Table 3-1, EPA Guidance Documents. These documents are available through EPA's Office of Solid Waste and Emergency Response, Brownfields Web Site located at: <http://www.epa.gov/swerosps/bf>.

**Table 3-1. EPA Guidance Documents**

Topic	Document Title	Summary
State Voluntary Cleanup Programs	Interim Approaches for Regional Relations with State Voluntary Cleanup Programs, November 14, 1996.  Current Memoranda of Agreements (MOA) on State Voluntary Cleanup Programs (VCP).	More than 35 states now have VCPs under which private parties that voluntarily agree to clean up a contaminated site are offered some protection from future state enforcement action at the site, often in the form of a "no further action" letter or "certificate of completion" from the state. Such state commitments do not affect EPA's authority to respond to actual or threatened releases of hazardous substances under CERCLA.



Topic	Document Title	Summary
New Tax Incentive to Spur the Cleanup and Redevelopment of Brownfields	Brownfields Tax-Incentive Fact Sheet. EPA 500-F-97-155, August 1997.  Public Law 105-34 Subtitle E of Title IX (Note this is a hand enrollment pursuant to Public Law 105-32, H.R. 2014).	On August 5, 1997, President Clinton signed the Taxpayer Relief Act (HR 2014/PL 105-34), which included a new tax incentive to spur the cleanup and redevelopment of brownfields in distressed urban and rural areas. The Brownfields Tax Incentive is a tax credit program designed to help bring thousands of abandoned and under-used industrial sites back into productive use, providing the foundation for neighborhood revitalization, job creation, and the restoration of hope in U.S. cities and distressed rural areas.
Cumulative Risk Assessment Guidance-Phase I Planning and Scoping	EPA Memorandum, Subject: Cumulative Risk Assessment Guidance-Phase I Planning and Scoping, July 3, 1997.  EPA Guidance on Cumulative Risk Assessment Part 1, Planning and Scoping, July 3, 1997.	The focus of risk assessment within EPA is evolving away from the potential of a single pollutant in one environmental medium toward integrated assessments involving suites of pollutants in several media that may cause a variety of adverse effects on humans, plants, animals, or even effects on ecological systems and their processes and functions.
Liability	Liability and Other Guidance Quick Reference Fact Sheet, April 1997. EPA 500-F-97-104.	EPA has been working with states and municipalities to develop guidance that will provide some assurance that, under specified circumstances, prospective purchasers, lenders, and property owners do not need to be concerned with Superfund liability. The guidance clarifies the liability of certain parties' associations with and activities at a site, and clearly states EPA's decision to use its enforcement discretion not to pursue such parties. EPA anticipates that these clear statements of their position will alleviate any concerns parties may have in becoming involved in the cleanup and redevelopment of sites.
Land Use in the CERCLA Remedy Selection Process	EPA Memorandum: Land Use in the CERCLA Remedy Selection Process, May 1995, OSWER Directive No. 9355.7-04.	EPA issued a directive encouraging discussions among local land use planning authorities and communities to be conducted early in the site assessment process. This directive ensures that site remedies meeting future land use objectives and protecting human health and the environment are selected.
Policy Toward Owners of Property Containing Contaminated Aquifers	EPA Memorandum and Directive: Final Policy Toward Owners of Property Containing Contaminated Aquifers.	EPA issued guidance outlining its policy of not suing property owners for groundwater contamination of an aquifer underlying the property if the owner did not cause or contribute to the contamination.
Guidance on Agreements with Prospective Purchasers of Contaminated Property	EPA Memorandum: Guidance on Settlements with Prospective Purchasers of Contaminated Property, May 1995.	EPA issued guidance outlining situations under which they may enter into an agreement not to file a lawsuit against a purchaser of property that was contaminated prior to the purchase.



Topic	Document Title	Summary
<p>Model Comfort Letter Clarifying NPL Listing, Uncontaminated Parcel Identifications, and CERCLA Liability Involving Transfers of Federally Owned Property</p>	<p>Memorandum: Transmittal of the Revised Model Comfort Letter Clarifying NPL Listing, Uncontaminated Parcel Determinations, and CERCLA Liability Involving Transfers of Federally Owned Property, August 1995.</p> <p>OSWER Guidance, Model Comfort Letter Clarifying NPL Listing, Uncontaminated Parcel Determinations, and CERCLA Liability Involving Transfers of Federally Owned Property, January 1996.</p> <p>EPA Memorandum on Military Base Closures: Guidance of EPA Concurrence in the Identification of Uncontaminated parcels under CERCLA Section 120(h)(4), April 19, 1994, OSWER Directive No. 9345.0-09, EPA 540-F-94-32.</p>	<p>EPA issued this model comfort letter clarifying common myths about NPL listing and CERCLA liability, and highlighting certain provisions concerning the transfer of federally owned properties.</p>
<p>Policy on the Issuance of Comfort/Status Letters</p>	<p>EPA Memorandum: Policy on the Issuance of Comfort/Status Letters, November 12, 1996.</p> <p>Policy on the Issuance of Comfort/Status Letters, November 12, 1996.</p>	<p>EPA headquarters and regional offices often receive requests from parties for some level of "comfort" that if they purchase, develop, or operate on a redeveloped property, EPA will not pursue them for the costs to clean up any contamination resulting from the previous use that was not addressed despite good-faith efforts to do so. The majority of the concerns raised by these parties can be addressed through the dissemination of information known by EPA about a specific property and an explanation of what the information means to EPA.</p>
<p>Asset Conservation, Lender Liability, and Deposit Insurance Protection Act of 1996</p>	<p>HR3610; Sections 2501-2505, September 30, 1996.</p>	<p>As part of the Omnibus Consolidated Appropriations Bill for Fiscal Year 1997 signed by President Clinton on September 30, Congress enacted the Asset Conservation, Lender Liability, and Deposit Insurance Protection Act of 1996. The act includes lender and fiduciary liability amendments to CERCLA, amendments to the secured creditor exemption set forth in Subtitle I of RCRA, and validation of the portion of the CERCLA Lender Liability Rule that addresses involuntary acquisitions by government entities. The amendments made by the act apply to all claims not finally adjudicated as of September 30, 1996, which include all cases that are in the process of being settled.</p>
<p>Policy on CERCLA Enforcement Against Lenders and Government Entities That Acquire Property Involuntarily</p>	<p>Federal Register (Volume 60, Number 237), December 11, 1995.</p>	<p>EPA issued guidance describing the agency's policy of not pursuing for cleanup costs those lenders who provide money to an owner or developer of a contaminated property, but do not actively participate in the daily management of the property. The guidance also clarifies what is meant by "involuntary" acquisition by a government entity.</p>



Topic	Document Title	Summary
Underground Storage Tank Lender Liability Rule	Federal Register (Volume 60, Number 173, Page 46691-46715)[Rules and Regulations ], September 7, 1995.	EPA issued this rule clarifying when a lender may be exempt from liability for loans on properties containing USTs.
Guidance on Deferral of NPL Listing Determinations While States Oversee Response Actions	EPA Memorandum and Guidance: Transmittal of the "Guidance on Deferral of NPL Listing Determinations While States Oversee Response Actions", August 1995, EPA 540-F-95-002, OSWER Directive No. 9375.6-11.	EPA guidance that provides a framework for Regions, States, and Federally-recognized Tribes to determine the most appropriate, effective, and efficient means to address more sites more quickly than EPA otherwise would address them.
Community Reinvestment Act (CRA)	Community Reinvestment Act (CRA) Quick Reference Fact Sheet, April 1997, EPA 500-F-97-100.	In 1977, Congress enacted CRA to require banks, savings and loans, and other lenders to make capital available in low- and moderate-income urban neighborhoods, thereby boosting the nation's efforts to stabilize these declining areas. Concern over potential environmental and financial liability for cleaning up sites in these areas has made lenders, developers, and property owners reluctant to finance redevelopment of these properties. Rather than reuse former urban industrial sites, businesses have instead moved to suburban or rural "greenfields," which carry fewer perceived risks to development.

### 3.9.2 ASTM Guidance

ASTM is a not-for-profit organization that provides a forum for the development and publication of voluntary consensus standards for materials, products, systems and services. More than 32,000 members representing producers, users, ultimate consumers, and representatives of government and academia from over 100 countries develop documents that serve as a basis for manufacturing, procurement, and regulatory activities.

ASTM develops standard test methods, specifications, practices, guides, classifications, and terminology in 130 areas covering subjects such as metals, paints, plastics, textiles, petroleum, construction, energy, the environment, consumer products, medical services and devices, computerized systems, electronics, and many others. ASTM has no technical research or testing facilities; such work is done voluntarily by the ASTM members located throughout the world.

Following are standard guides ASTM has published for use in redevelopment of contaminated sites. These resources can be purchased through ASTM's Web Site located at: <<http://www.astm.org>>.



**Table 3-2. ASTM Guidance Documents**

Topic	Document Title	Summary
Environmental Site Assessments	ASTM Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment	Defines commercial and customary practices in the U.S. for conducting initial Phase I Environmental Site Assessments of commercial real estate with respect to the range of contaminants within the scope of CERCLA and to petroleum products.
	ASTM Standard Guide for Environmental Site Assessments: Phase II Environmental Site Assessment Process	Discusses the framework for employing good commercial and customary practices in the U.S. when conducting Phase II environmental site assessments of commercial property with respect to the potential presence of a range of contaminants within the scope of CERCLA, as well as petroleum products. Phase II assessments are more detailed assessments that address the recommendations of a Phase I assessment.
Accelerated Site Characterization	ASTM Standard Guide for Accelerated Site Characterization for Confirmed or Suspected Petroleum Releases	Describes accelerated site characterization (ASC), a process used to rapidly and accurately characterize confirmed or suspected releases of petroleum. The guide provides a framework that responsible parties, contractors, consultants, and regulators can use to streamline and accelerate site characterization.
Sustainability	ASTM Standard Guide for Process of Sustainable Brownfields Development	Discusses the redevelopment of a brownfields property for all stakeholders. It identifies impediments to such redevelopment and suggests solutions that can facilitate completion of a successful project. It describes the flexible process of sustainable brownfields redevelopment that actively engages property owners, developers, government agencies, and the community in conducting corrective action, economic evaluation, and other efforts that promote the long-term productive reuse of a brownfields property.
Risk-Based Corrective	ASTM Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites	Defines RBCA as a process for assessing and responding to a petroleum release in a manner that ensures the protection of human health and the environment. The guide will assist brownfields decision makers who wish to become familiar with another approach that can be used to assess environmental risk at a site, in conformity with applicable federal, state, local, and tribal regulations. The diversity and flexibility of a RBCA approach is defined and discussed, and the tiered approach of the process is summarized. Although the RBCA process is not limited to a particular site, the guide emphasizes the use of RBCA in response to releases of petroleum.



### 3.9.3 Brownfields Pilots and Demonstrations

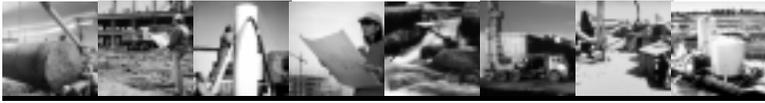
EPA's Brownfields Economic Redevelopment Initiative is designed to empower states, communities, and other stakeholders in economic redevelopment to work together in a timely manner to prevent, assess, safely clean up, and sustainably reuse brownfields. EPA is funding the pilot programs presented in Table 3-3.

**Table 3-3. EPA Pilot Programs**

Pilot	Summary
Assessment Demonstration Pilots	Test redevelopment assessment approaches, direct special efforts toward removing regulatory barriers without sacrificing protectiveness, test innovative financial incentives, and provide education to stakeholders. EPA has awarded cooperative agreements to facilitate coordinated public and private efforts at the federal, state, tribal, and local levels for these demonstration pilots.
Job Training and Development Demonstration Pilots	Brings together community groups, job training organizations, educators, labor groups, investors, lenders, developers, and other affected parties to address the issue of providing environmental employment and training for residents in communities impacted by the redevelopment of contaminated sites. The goals of the pilots are to facilitate cleanup of sites contaminated with hazardous substances and prepare trainees for employment in the environmental field, including training in alternative or innovative treatment technologies.
Brownfields Cleanup Revolving Loan Fund (BCRLF) pilots	Enables states, local governments, and tribes to make loans for the cleanup and redevelopment of contaminated properties. In particular, these pilots will test revolving loan fund models that influence public and private cleanup efforts.

Following are several resources available to assist pilot participants. These resources are located on EPA's Office of Solid Waste and Emergency Response, Brownfield Web Site at: <http://www.epa.gov/swerosps/bf>.

- Fact sheets about national pilots workshop
- Suggestions about starting a pilot from others who have experience with brownfields programs, including a list of resources for starting a pilot effort and general suggestions on several subject areas from participants with experience in brownfields pilots
- Information on available funding mechanisms
- Information on grants for the assessment pilot



## 4.0 LIABILITY AND NON-REGULATORY CONSIDERATIONS

There are considerations that should be addressed when beginning a redevelopment project in the U.S. Some of these considerations become barriers to redevelopment (for example, potential liability) if not adequately dealt with, and some considerations become drivers that can motivate the redevelopment project on the basis of the intended reuse for the site. This section discusses these considerations, including liability issues that relate to cleanup financing, insurance, and legal issues; cleanup drivers such as ecological and human health, social, economic, and political; and the roles of various stakeholders.

### 4.1 Liability

As discussed briefly in Section 3.0, the main reason the principal entities involved in redevelopment (owners, purchasers, developers, lenders, investors, and insurers) are reluctant to pursue redevelopment projects is that federal environmental laws assign liability to a broad range of entities. Purchasers are concerned about possible liability associated with contaminated wastes caused by the previous owners. In addition, current owners fear the potential for future liability related to the presence of unknown contamination.

Federal government environmental cleanup laws, such as CERCLA, or Superfund, have served a crucial role in protecting human health and the environment. However, the uncertainties associated with liabilities under these laws, as well as the fact that liabilities may arise under both federal and state law, can create barriers that inhibit the primary entities from investing in, redeveloping, and reusing contaminated properties. Most liability risks can be grouped into the three broad categories presented in Table 4-1.

**Table 4-1. Three Broad Liability Risk Categories**

Risk Category	Summary	Associated Risks
Remediation-Based Risk	The potential that if site contamination exists, the owner and operator will be liable for the costs of cleanup, including site investigation and assessment, legal fees, and regulatory compliance consulting fees.	<ul style="list-style-type: none"> <li>• Cost of identification and determination of site contamination</li> <li>• Cost of site remediation</li> <li>• Cost of ensuring compliance with federal and state regulations during remediation, such as consulting and legal fees</li> <li>• Cost of legal fees to defend against lawsuits brought by regulators (federal and state) and third parties</li> </ul>



Risk Category	Summary	Associated Risks
Property Value Impairment Risks	The potential that if site contamination exists, the owner and operator will bear the costs of lawsuits stemming from reduced value of neighboring properties or nuisance caused.	<ul style="list-style-type: none"> <li>• Payment required due to a nuisance caused to a neighboring property, such as remediation of the site causing substantial noise in the neighborhood</li> <li>• Payment required due to the erosion of equity of a neighboring property, such as the perception that contamination on the site causes the value of a neighboring property to decline</li> <li>• Payment required due to the decreased security interest of the lender of a neighboring property, such as on-site contamination causing the value of a foreclosed neighboring property to decline</li> </ul>
Personal Injury Risks	The potential that if site contamination exists, the owner and operator will be liable for the costs of lawsuits stemming from bodily injury caused by contamination existing on site or migrating off site.	<ul style="list-style-type: none"> <li>• Payment required because of personal injury occurring off site caused by migrating contaminants</li> <li>• Payment required because of personal injury occurring on site caused by site contamination</li> </ul>

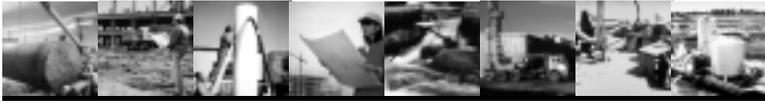
## 4.2 Cleanup Drivers

In addition to issues of potential liability, considerations, such as the motivators or drivers for the redevelopment of a site, can determine the course of the redevelopment process and can help advance cleanup and redevelopment activities, while achieving significant environmental, human health, social, economic, and political benefits. Such drivers include ecological and human health, social, economic, and political.

### 4.2.1 Ecological and Human Health Drivers

Hazardous waste, by definition, poses a substantial or potential threat to human health and the environment. During the cleanup process, the levels of harmful chemicals in the air, soil, and groundwater are decreased and the environment and public health of nearby communities are improved. These results drive the cleanup and initiate redevelopment projects. Therefore, two major drivers in the redevelopment of hazardous waste sites are the environment and the public health of nearby communities.

It is essential that an appropriately detailed study of the site be performed to identify the cause, nature, and extent of contamination and the possible threats to the environment or to any people living or working nearby. The results of such a study can be used in determining goals for cleanup, quantifying risks, determining acceptable and unacceptable risk, and developing effective cleanup plans that do not cause unnecessary delays or costs in the redevelopment and reuse of the property.



#### **4.2.2 Social Drivers**

In most communities, redevelopment of all but the most valuable sites is undertaken through the joint participation of public and private sector entities. Participation by the public sector is contingent upon a social or public purpose to be served by a redevelopment project. Examples of social drivers include job creation, the elimination of blight and poverty, and environmental protection.

Community interest can be a major factor in initiating and implementing redevelopment projects. Before considering the redevelopment of a hazardous waste site, it is important to assess public support and to determine how to incorporate and encourage community participation. One challenge for sponsors of redevelopment projects is to determine how to convince members of the community that active involvement is worthwhile and to provide the community with an opportunity to have direct and meaningful impact on decisions.

#### **4.2.3 Economic Drivers**

Economic drivers are factors that benefit the investor in the cleanup of hazardous waste sites or the economy of the community. For example, investors can often purchase hazardous waste property at a reduced price when the present owner cannot finance the required cleanup. After the investor has completed the cleanup, the property is often sold or redeveloped for a profit. To determine whether an economic driver exists, the investor must analyze the current market value of similar real estate and predict the value of the site once redevelopment is complete. Economic drivers for the public sector are job creation and increased tax revenues.

Significant developments due to the economic drivers mentioned, are the emergence of experienced, willing investors and lenders and the emergence of reliable methods for evaluating contaminated property and products to quantify and control environmental risks. The federal government also has developed tax and grant programs to encourage redevelopment of hazardous waste sites and to provide more readily accessible funding for companies. The increased interest by investors in contaminated properties has meant that many properties with little contamination, and therefore fewer barriers, have already been purchased and eventually only the properties with more severe contamination and other barriers will be available on the current market.

#### **4.2.4 Political Drivers**

Federal, state, and local governments, agencies, and non-governmental entities are taking an increasingly active role in promoting the identification, cleanup, and redevelopment of contaminated sites. In the past 2 years, many states have initiated new programs and others have modified their existing programs to incorporate changes needed to deal with hazardous waste sites in their jurisdictions. In addition, with increasing awareness



of environmental issues, politicians have begun to add environmental topics to their platforms and to endorse legislation and projects that improve the environment and public health of communities.

The role of local government in integrating redevelopment activities can include coordinating community relations, brokering reuse, providing and coordinating public funding, acting as liaison with environmental regulators, assuming liability for environmental conditions, and preventing redevelopment of a site for a use that risks future contamination. Some progressive local governments are creating information and resources to assist with all phases of the redevelopment of contaminated sites.

Local governments also are in an ideal position to facilitate and promote the successful reuse of redevelopment properties. Local officials and municipal managers often play an integral role in bringing together all the diverse interests involved in a redevelopment project. However, their role as facilitators is often difficult because of the groups involved and the complexity of the issues. For example, the regulatory framework that determines the outcome of many redevelopment projects falls under the jurisdiction of federal and state agencies; most of the necessary capital to fund redevelopment is controlled by private financial institutions; and many decisions about reuse of property are in the hands of the property owner.

#### **4.3 Future Land Use Planning and Issues**

The future land use of a hazardous waste site also is an important driver in the redevelopment process. Anticipating future use of the site is a consideration in determining the appropriate extent of remediation and therefore the cleanup costs of the site. Future use of the land will affect the types of exposures and the frequency of exposures that may occur and therefore, affects the nature of the remedy chosen.

Land use assumptions affect the identification of exposure pathways that are evaluated during the risk assessment. Current land use is critical in determining whether there is a current risk associated with a site, and future land use is important in estimating potential future threats and possible future liability. The results of the risk assessment determine the degree of remediation necessary to ensure long-term protection at these sites. Early community involvement, with a particular focus on the community's desired future uses of a site, should result in a more democratic decision-making process; greater community support for cleanup solutions selected as a result of the process; and more expedited, cost-effective cleanups. The following steps should be taken when considering future land use.

- Discussions with local land use planning authorities, officials, and the public, as appropriate, should be conducted during the initial assessment of the site. These discussions will help developers understand the reasonable anticipated future uses of the land on which the hazardous waste site is located.



- If the site is located in a low income or minority community, extra efforts should be made to reach out to and consult with segments of the community that are not necessarily reached by conventional communication vehicles or through local officials and planning commissions.
- Cleanup actions should reflect the reasonably anticipated future land use or uses.
- Future land use assumptions should allow risk assessment to be focused on developing practical and cost effective cleanup alternatives. These alternatives should lead to site activities that are consistent with the reasonable anticipated future land use.

Land uses that will be available following completion of a cleanup are determined as part of the cleanup process. During this process, the goal of realizing reasonably anticipated future land uses is considered, along with other factors. Any combination of unrestricted uses, restricted uses, or use for long-term waste management may result.

#### **4.4 Roles of Stakeholders**

Like the drivers discussed previously, the roles of different stakeholders also can affect the course of the redevelopment process. There are three stakeholder groups that should be considered.

- Federal EPA, state, tribal, or local government or community leaders who drive the reuse effort
- Developers willing to accept the challenge associated with contaminated or formerly contaminated sites
- Financial institutions willing to lend money

##### **4.4.1 Role of EPA**

EPA, states, tribes, or local governments or communities all play critical leadership roles in successfully reusing Superfund sites and other contaminated properties. EPA Headquarters and regional staff work to coordinate efforts to identify and prioritize candidate sites for the Brownfields Economic Redevelopment Initiative. EPA then works with states, tribes, or local governments or communities to move the reuse effort forward. One of EPA's most important leadership roles is to ensure that reuse information is shared among all stakeholders. EPA, particularly at the regional level, may also serve as a project "catalyst," coordinating the process from start to finish, from identifying a candidate site to working with communities on public education and outreach.



#### **4.4.2 Role of States and Tribes**

Like EPA, states and tribes lead site reuse efforts by serving as project catalysts and by coordinating and facilitating project activity. One of the most important roles for states and tribes is to attract developers to a particular site. Through tax incentive plans, regional development plans, strong reduction of urban expansion programs, and other initiatives, states and tribes send a strong message to developers and financial institutions that the state and tribes are committed to redeveloping sites and maintaining uncontaminated property for other uses.

#### **4.4.3 Role of Local Governments and Communities**

Local governments and communities also can play a critical leadership role in the redevelopment process. Local government and community leaders generally want to return abandoned or idle sites to productive use to increase tax revenues, stimulate the local economy, prevent or reduce urban blight, and conserve valuable unused property. In many cases, local governments and communities may serve as the project catalyst by helping EPA, states, and tribes recognize a site's potential for reuse. In other instances, local governments and communities simply make sure that proposed site reuse plans meet the local government and community's current and future economic needs.

Regardless of who plays the leadership role, a site will not be returned to productive use unless local governments and communities are committed to redevelopment. Inevitably, at some point in the redevelopment process, there are project difficulties. Strong catalysts, whether in the form of EPA officials, state officials, tribal leaders, local government officials, community leaders, or private citizens, can push the project along, remove barriers to progress, and help resolve disputes or issues that prevent completion of the project. Local government and how it relates specifically to community involvement issues is discussed in Section 4.8.3.

#### **4.4.4 Role of Developers**

Contaminated sites cannot be redeveloped unless there are private developers that are willing to invest in currently or formerly contaminated property. Developers include purchasers, investors, brownfields development companies, real estate investment trusts (REIT), traditional development companies, intermediaries, and nonprofit community development corporations and municipalities.

Contaminated sites can be attractive investments because they are often undervalued, and can be located in prime real estate areas (for example, waterfront property). Low property values can lead to large profits for willing developers, with additional economic benefits to the local community. However, the threat of liability may make it difficult for developers to secure loans for redevelopment projects. Developers must coordinate their



activities closely with state and tribal officials, local governments, and the community to ensure that the remedy used to clean up the site does not restrict future land uses. For example, many contaminated sites are sealed with a protective cap. While the cap helps to prevent future exposure, a cap's structure sometimes dictates what can and cannot be built on top of it. Many developers will tailor their redevelopment plan to take advantage of the cap, thereby lowering costs and increasing profits.

Familiarity with the redevelopment process, the tools and technologies employed for site remediation, and the availability of public sector incentives, will allow a developer to propose an appropriate remediation strategy. Developers should be able to predict the various components of a development project that are related to contamination, including:

- Scope of remediation necessary for the intended reuse at the site
- Best approach to conducting that remediation
- Costs of remediation
- Costs of liability resulting from both remediation activities and potential claims of government agencies and third parties
- Timing of the proposed remediation, including the time required to obtain government permits and approvals

Developers implement a variety of strategies to expedite projects. The reuse strategy, for example, can help offset typically higher redevelopment costs associated with redevelopment projects. Such higher costs require a similarly high cash flow to match normal returns in the real estate industry. Redeveloped contaminated properties must be able to generate a return commensurate with the additional risks of environmental problems. Higher-density redevelopment projects have a better chance of producing an adequate profit. Lower-density projects may need larger public subsidies or yield a lower rate of return.

Regardless of whether a redevelopment project involves a low or high density reuse, the feasibility of the redevelopment project ultimately will depend on the ability of the developer to predict the market. As noted previously, sites are characterized by factors, such as location or market demand, to ensure that the reuse will be financially viable after cleanup of the site. But equally important is the ability of the developer to devise a reuse strategy that takes advantage of a market opportunity. In that sense, redevelopment of contaminated or potentially contaminated sites is no different from any other development project. If the developer does not have the ability to accurately gauge market demand for the proposed reuse, it is less likely that the project will proceed. Conversely, if the developer is able to conceive of a viable reuse for the site, and assuming that environmental and other costs are not excessive, the project is likely to proceed.



To strengthen a project, developers may choose to develop sites incrementally. By doing so, developers are able to proceed with a project that otherwise would not have been economically viable, sometimes using income generated from initial stages (for example, cleaning up a portion of the sites where minimal contamination is present) to help finance later site cleanup. Developers expedite projects by employing marketing strategies designed to enhance the demand, reduce the potential negative impact of stigma resulting from potential (or actual) contamination. For example, the developer could attract a high-profile public use to a portion of the site (a federal court) by donating the property for such a purpose, and, in doing so, provided a solid anchor for proposed residential development elsewhere on the site.

As noted above, liability concerns are frequently cited as obstacles to redevelopment, but almost always in combination with issues related to known or anticipated costs. These liability concerns pertain to the fears that, as a PRP, the developer is liable for the considerable cleanup costs they may incur if previously unknown contamination is found on the site. Other environmental uncertainties in the redevelopment process, that also are a concern include: the potential stigma tied to contaminated sites, the uncertainty related to future compliance costs, and problems in completing the regulatory process.

The developer faces potential uncertainty in the ability to market property to those who know that it was contaminated. Designation as a Superfund site can stigmatize a property, and cases in which pollution is highly publicized can have the same effect. It may be necessary to discount the potential return on investment for such properties to account for the effects of such a stigma. However, research suggests that stigmatization appears unlikely to have significant effects on the viability of most redevelopment projects.

#### **4.4.5 Role of Owners**

Property owners include sellers, publicly traded companies, privately held companies, institutional investors, REITs, and government agencies that own, manage, and transfer environmentally impaired properties. This section discusses the roles and strategies of the property owners in the redevelopment of a site.

As with developers, the strategies that owners of contaminated sites adopt in dealing with their properties can have a dramatic impact on the outcome of, or even the opportunity to conduct, land reuse projects. Some owners of contaminated sites, especially large, heavy industrial operations have chosen not to sell their sites at all, even those that they have abandoned. Some companies are simply fencing in and providing limited entry to obsolete facilities. Owners often cautiously explore a different strategy to expedite development reuse options under which they lease their facilities to new users, but do not sell them.

This approach can be mutually beneficial for both the owner and the prospective developer and can enhance the prospects for redevelopment. For owners, the principal advantage of retaining title is that the new user does not



control the remedial action. Retaining title allows the original company to maintain some control over site access and enforce lease restrictions, which can ultimately limit the exposure of the owner to future litigation. Retaining title also gives the owner control over relations with federal and state regulatory agencies, remediation needs, and timing. For the developer, the opportunity to undertake a project under a lease-purchase arrangement reduces the uncertainty associated with potential contamination and liability.

An alternative strategy owners adopt to expedite redevelopment of contaminated sites is the discounting of property prices to offset the cleanup costs. If the true extent and nature of a site's contamination is unknown, investors are generally cautious. However, in many situations, sellers encourage the purchase and development of contaminated properties by discounting the price of the property.

#### **4.4.6 Role of Financial Institutions**

Like developers, financial institutions can generate large profits and mitigate losses by returning contaminated or formerly contaminated sites to productive reuse. Until recently, however, financial institutions were unwilling to accept the potential liability pertaining to redevelopment projects.

Historically, financial institutions avoided reuse projects because of lender liability. Funding for reuse diminished suddenly in the early 1980s when a district court ruled that a financial institution could be held liable financially for cleanup costs at a site if that institution could potentially influence operations conducted at the site. As the possibility of influence is an almost integral part of a standard business loan, the already limited private funding for redeveloping contaminated sites vanished after that ruling.

Current federal laws restricting lender liability are designed to help solve that problem. Under the laws, lending institutions cannot be held liable at sites for which their association is solely financial. A financial institution can be held liable for site cleanup costs only when the institution exerts specific control over decisions about producing, storing, or transporting hazardous wastes.

Even with this new protection from liability, financial institutions still have been wary of lending money for redevelopment projects. For example, a large cost recovery claim against a developer could lead to the bankruptcy of the developer and the possible loss of the institution's investment as well as the financial institution becoming the primary owner of the property. Increasing use of Prospective Purchaser Agreements (PPA) (agreements between EPA and potential, or prospective, purchasers of a contaminated site where EPA agrees not to recover future costs from the purchaser in exchange for an agreement by the purchaser to perform or to pay for an agreed-upon portion of the site remedy) and clarification of lender liability by Congress has given financial institutions more confidence in lending money to interested developers.



## **4.5 Financing Issues**

As mentioned previously, liability is the main barrier to redevelopment and reuse. Developers need financing to conduct a redevelopment; however, there are many potential liabilities associated with obtaining financing that can create barriers. Different financing strategies may be appropriate at different stages in the redevelopment process, and a combination of strategies may be necessary to meet the financing demands of projects.

The following subsections discuss a variety of financing strategies currently being used in brownfields redevelopment, including subsidized low interest loans, revolving loan funds, public grants, informational and advisory services, liability assurances, financial assurances, and legislative reforms.

### **4.5.1 Public Financing**

A loan is money that must be repaid in a specified amount of time at a negotiated interest rate. Redevelopment projects may be able to identify state and federal finance programs that will provide capital at subsidized rates for projects that meet their eligibility criteria. Some debt finance programs are revolving, meaning that the program is partially financed by repayment of earlier debt.

#### **4.5.1.1 Subsidized Low Interest Loans**

Subsidized low interest loans reduce the cost of capital for project sponsors. They also provide full or partial financing for projects that otherwise might be unavailable on the private capital markets or that would be available only at an interest rate higher than the prevailing rates to compensate for the potential additional risk involved in the redevelopment of contaminated sites. Many projects have made use of existing state and local loan programs for redevelopment. Others have made use of loan programs specifically targeted to assessment, cleanup, and redevelopment of contaminated sites.

#### **4.5.1.2 Revolving Loan Funds**

In some cases, state and local loan programs operate revolving loan funds, under which future loans are financed through the repayment of current loans. The mechanism may be particularly appropriate for assessment, cleanup, and redevelopment of contaminated sites, since repayment terms tend to be more flexible than the terms of commercial loans.



#### **4.5.1.3 Bonds**

Bonds can extend payment for new projects over a period of 15 to 30 years allowing time to generate sufficient income to repay the capital invested. Typically, states and local governments repay bonds with revenues from taxes, fees, or other sources. For redevelopment projects, bonds backed by tax increment financing can be particularly popular because they rely on tax revenues anticipated from the redeveloped property after the project has been completed.

#### **4.5.1.4 Lease Arrangements**

Some communities find that redevelopment projects can be stimulated by using a public agency to buy the sites (or take title to abandoned property), assess and cleanup the contamination, and then lease the property to private developers. The lease shields the developer from environmental liability as an owner (but not as a transporter or generator of hazardous waste), and gives the community a source of revenue. In some cases, the local government finds a lessor before starting the project. In others, it pursues the project before identifying tenants.

#### **4.5.1.5 Public Ownership**

A second option that has been pursued is to assess, cleanup, and redevelop a site as a publicly owned parcel. After the local government has assembled the property and begun the first stages of cleanup, it can either sell the property to the private sector or retain ownership on its own behalf.

#### **4.5.1.6 Land Reclamation Banks**

Some communities use land reclamation banks, which take title to potentially contaminated sites by property tax foreclosure, eminent domain, or purchase. They assess and clean up the site, then sell the property to a developer. Some communities use the proceeds from the lease or sale of the property to finance future projects.

#### **4.5.1.7 Indirect Strategies**

Some financing strategies available to state and local governments do not directly increase the funds available for investment in redevelopment of contaminated sites. Rather, such indirect strategies facilitate or enable site assessment, cleanup, and redevelopment by overcoming barriers that impede financing for the project. Indirect strategies can help overcome three kinds of barriers:



- Knowledge Gaps - A developer or investor may be interested in, or willing to consider, financing a redevelopment project, but be unaware of suitable sites or regulatory options. Information and advisory services provided by state and local governments can overcome such knowledge gaps.
- Perceived Liability - Many lenders may be aware of issues related to redevelopment but fear the potential liability associated with a particular site, which may or may not be commensurate with to the site's actual liability risk. In addition, lenders may fear the public's perception of environmental contamination, and the associated stigma, which can have a financial impact on a project if it deters customers from using the property. Information and advisory services, and more important, financial assurances provided by states and localities can overcome problems related to perceived liability.
- Actual Liability - Some indirect financing strategies shield property owners and redevelopers from environmental liability risk by providing liability assurances.

#### **4.5.2 Information and Advisory Services**

Developers and capital providers often lack information about sites, the site assessment process, and liability law. By educating developers and capital providers about available sites, the site assessment process, and environmental legislation, the reluctance by developers and capital providers to participate in redevelopment projects can be overcome. For example, changes in environmental regulations can affect lending decisions by capital providers. In addition, developers and capital providers should be aware of land use controls, cleanup options, and potential reuses of property.

##### **4.5.2.1 Land Registry**

A number of communities have set up land registries that collect information about potential redevelopment sites. The registries inform developers about the potential advantages and disadvantages of sites and foster the understanding at sites that might otherwise be overlooked. Some communities operate land registries in conjunction with programs that fund site investigations and assessments for the parcels. After those tasks have been performed, the registry will contain detailed information about the site and anticipated cleanup costs.

##### **4.5.2.2 Brokering and Facilitation**

An agency or local government can broker or facilitate agreements between federal, state, and local agencies and developers. The public sector can provide services that bring buyer and seller together, help negotiate site assessment, cleanup action, and redevelopment deals, and assist in arranging financing for projects.



#### **4.5.2.3 Regulatory Compliance Assistance**

A public environmental agency can advise developers about regulatory options and assist in obtaining cooperation from other agencies. Navigating the environmental permit process can be difficult. Such assistance helps developers avoid unacceptable delays in project schedules. To expedite the process, some communities have formed task forces including members representing all agencies responsible for regulating a particular redevelopment site.

#### **4.5.3 Private Financing**

The private sector is leading the way in redevelopment of contaminated sites. While some public sector programs fund municipal efforts to clean up contaminated land, most cleanup resources come from private-sector investors who are looking for sound investments that promise returns above the market value. Private companies and joint ventures between developers, environmental consultants, insurers, and financiers that specialize in redevelopment fill this unique market area.

##### **4.5.3.1 Revolving Funds**

A revolving fund is a source of money that provides loans for specific purposes including financing redevelopment projects. The parties reimburse the fund for the loan amount plus interest. Through payback of principal and interest, the fund is able to maintain the same or increased levels of funding. Private revolving funds are typically developed through revenue disbursement from a trust fund.

##### **4.5.3.2 Trust Funds**

Trust funds are special accounts developed to receive and disburse revenues from taxes or fees for dedicated purposes including redevelopment projects. These funds differ from revolving funds in that they do not maintain funding capacity through payback of loans, but through new injections of revenue through taxes or fees.

##### **4.5.3.3 Real Estate Investment Trust**

REITs are funds of revenues from private investors. REITs are holding companies that act as primary investors when purchasing property. For redevelopment of contaminated sites, the REIT acts as the owner, thereby shielding investors from liability in excess of the investor's initial investment.



A REIT is essentially a mutual fund that specializes in pooled investments in real estate. REITs are fully integrated companies with professional management and staff that put real estate planning, acquisition, development, management, and sales under one roof. With their investment focus, REITs can assemble diverse portfolios of real estate properties to spread and reduce financial risks. REIT dividend earnings can be tax-exempt for tax-exempt investors such as pension funds. Most REITs have a particular real estate investment focus, such as residential housing, industrial properties, general commercial properties, or shopping centers.

Hundreds of REITs throughout the country provide investment vehicles for billions of dollars in real estate properties located in thousands of communities. REITs are a major force in the development of apartment housing and shopping centers. As an industry, REITs have been in existence for more than 30 years and are vehicles for billions of dollars in real estate investments each year (\$6.5 billion in 1992).

REITs that focus on industrial and commercial real estate are beginning to include select brownfields properties in their portfolios. New REITs are being established that focus on buying, assessing, cleaning up, redeveloping, or selling contaminated properties. Such REITs can be structured to focus investments on real estate properties located in Empowerment Zone and Enterprise Communities (EZ/EC). An EZ or EC is a distressed community that the Federal government has targeted to receive substantial investment of federal technical resources to encourage private sector development, job growth, and entrepreneurship.

#### **4.5.4 Grant Programs**

A wide range of entities, including federal, state, and local governments, nonprofit organizations, and corporations, award grants for numerous purposes. Contaminated site assessment, cleanup, and redevelopment projects may be eligible for many existing grant programs. Further, EPA maintains a national demonstration pilot grant program specifically targeted to activities related to redevelopment of contaminated sites.

##### **4.5.4.1 EPA Brownfields Assessment Demonstration Grants**

As discussed previously, the Brownfields Economic Redevelopment Initiative seeks to empower states, communities, and other parties to redevelop contaminated sites. Under the initiative, over 300 communities across the country have received grants for demonstration pilots for the redevelopment of contaminated sites. The agency is funding the brownfields pilot projects for as much as \$200,000 each over a 2-year period. The pilots are designed to:

- Test redevelopment models
- Direct special efforts to remove regulatory barriers without sacrificing environmental protection



- Encourage community groups, lenders, investors, developers, and other parties to come together to clean up sites and return them to appropriate productive use
- Provide a series of redevelopment models for states and localities struggling with such efforts
- Provide guidance to cities for cleaning up industrial, contaminated sites and returning them to productive use

#### **4.5.4.2 Brownfields Cleanup Revolving Loan Fund Pilots**

Another major component of the Brownfields Economic Redevelopment Initiative is the award of cooperative agreements to states, cities, towns, counties, and tribes to capitalize on BCRLF pilots. The purpose of the pilots is to enable states, local governments, and tribes to make loans for the cleanup and redevelopment of contaminated properties. In particular, these pilots will test revolving loan fund models that influence public and private cleanup efforts.

#### **4.5.4.3 Empowerment Zone and Enterprise Communities**

The EZ/EC program is designed to empower communities across the nation by inspiring people to work together to create jobs and opportunities. As discussed earlier, an EZ or EC is a distressed community that the federal government has targeted to receive substantial investment of federal technical resources to encourage private sector development, job growth, and entrepreneurship.

In December 1994, the Department of Housing and Urban Development (HUD) designated six urban EZs and 65 urban ECs, and the Department of Agriculture (USDA) designated three rural EZs and 30 rural ECs. This first round of EZ/EC applications and selections was guided by four key principles: economic opportunity; sustainable development; community-based partnerships; and a strategic vision for change.

Designated EZs and ECs have a range of tools available to maximize the flow of private capital and investment to their nominated areas. Since its inception, the EZ/EC authority has provided more than \$2.5 billion in tax incentives and \$1.3 billion in grants to 104 urban and rural communities in 42 states.

In September 1996, EPA and HUD signed a Memorandum of Understanding (MOU) to work cooperatively on redevelopment strategies. The agreement states that the agencies will work together to identify and implement actions that link redevelopment activities with economic development and neighborhood revitalization. Actions as a result of that agreement include:

- Financial and technical assistance for state, tribal, and local governments to integrate assessment of redeveloped properties into economic development planning
- Job training initiatives for redeveloping assessment, cleanup, and redevelopment



#### **4.5.4.4 State Grant Programs**

Many states have grant programs that provide funding for localities and agencies that undertake assessment, cleanup, and redevelopment of contaminated sites. In seeking grants, project sponsors should know that grant assistance can be attained from a number of agencies including non-environmental agencies. For example, communities may be able to finance redevelopment projects through a state economic development agency. As an alternative, localities can seek grants not traditionally used for site cleanup, such as groundwater protection grants, which could be awarded for protecting groundwater from contamination from a site being redeveloped.

#### **4.5.4.5 Private and Nonprofit Grants**

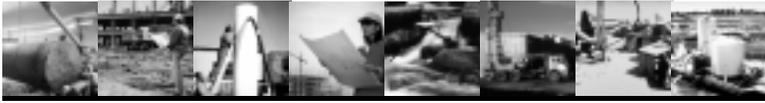
Private nonprofit organizations and corporations can also be a source of grant funds for redevelopment projects, especially for redevelopment and job creation activities. Publications, such as the Grants Register and the Foundation Directory, can direct states and localities to organizations and corporations that are likely to provide grants, as well as information about criteria, amounts available, and application procedures.

#### **4.5.5 Taxes and Special Assessments**

Tax incentives are one method local governments use to encourage institutional and private investment in redevelopment of contaminated sites. For example, local governments are easing the financial burdens of developers and owners by offering tax credits that can improve the cash flow of the project. Local governments also are becoming partners in redevelopment projects by allocating public works resources for site preparation and cleanup, or by allocating tax revenues or loan payments from other programs to fund specific project activities.

##### **4.5.5.1 Tax Increment Financing**

Tax Increment Financing (TIF) is typically used for local revitalization efforts including the redevelopment of contaminated sites, in economically distressed or abandoned areas. TIFs generate revenue from an increase in property values caused by the improvements being financed. For example, a number of governments have issued bonds backed by the anticipated increase in property values after redevelopment of a contaminated site has been completed. Alternatively, a portion of the additional taxes generated by redevelopment is returned to the project to pay for further work.



#### **4.5.5.2 Real Estate Transfer Tax**

Real estate transfer taxes are charged to the buyer or seller of a contaminated property at the time of transfer. Such taxes are a percentage of the assessed value of property transferred, a flat deed registration fee, or a combination of the two. Both state and local governments use this planning tool to fund land-related initiatives, including acquisition of natural lands.

#### **4.5.5.3 Tax Abatements**

Commonly used to stimulate investments in building improvements or new construction, tax abatements give local governments an incentive that can help attract investors of redevelopment of contaminated sites. Tax abatements can be permanent, or they can cover only the first few years of a project. Tax abatements can make otherwise uneconomical projects more financially feasible.

#### **4.5.5.4 Tax Initiatives**

In early 1996, the Clinton Administration proposed a \$2 billion tax incentive designed to encourage cleanup and redevelopment of contaminated sites. The United States Treasury estimates the tax package would leverage \$10 billion in private investment and could revive redevelopment of 30,000 contaminated sites. Among other provisions, the Administration's proposal would allow developers to deduct fully from their federal taxes the costs of environmental investigation and cleanup at designated redevelopment sites during the year the costs are incurred, instead of capitalizing the cost and deducting it over some period of years on an amortized basis.

On August 5, 1997, President Clinton signed the Taxpayer Relief Act, which included a new tax incentive to spur the cleanup and redevelopment of contaminated sites in distressed urban and rural areas. The Brownfields Tax Incentive builds on the momentum of the Clinton Administration's Brownfields National Partnership Action Agenda announced in May 1997. The national partnership outlines a comprehensive approach to the assessment, cleanup, and sustainable reuse of contaminated sites, including specific commitments from 15 federal agencies. It's anticipated that the Brownfields Tax Incentive will help bring thousands of abandoned and under used industrial sites back into productive use, providing the foundation for neighborhood revitalization, job creation, and the restoration of hope in our nation's cities and distressed rural areas.

Federal tax law generally requires that those expenditures that increase the value or extend the useful life of a property, or that adapt the property to a different use, be capitalized; and, if the property is depreciable, that those expenditures are depreciated over the life of the property. Therefore, the full cost cannot be deducted from income in the year in which the expenditure occurs. Such capitalization treatment also applies to the cost



of acquiring property. In contrast, repair and maintenance expenditures generally can be deducted from income in the year they are incurred. In the past, it was required that many environmental remediation expenditures be capitalized over time rather than fully deducted or expensed in the year in which they were incurred.

Redevelopers that incurred such expenditures were at a disadvantage because they were not able to fully deduct their remediation costs in the year in which they were incurred.

In 1994, the Internal Revenue Service (IRS) issued a ruling that stated that certain costs incurred to cleanup land and groundwater could be deducted as business expenses in that same year. However, the ruling addressed only cleanup costs incurred by the same taxpayer that contaminated the land. It did not address cleanup costs incurred by a party that had purchased contaminated property or an owner that was interested in putting the land to new use. Further, the IRS ruling was unclear about whether other remediation costs not specifically addressed in the ruling would be deductible in the year in which they were incurred or whether capitalization would be required.

Those unresolved issues created potential financial obstacles in the contaminated properties market. Specifically, owners of contaminated property could cleanup their property and sell the clean property at its full market value, enabling them to fully recover the cost of remediation. However, prospective purchasers of contaminated property had to purchase the property at its impaired value, attributable to the contamination, and capitalize the remediation costs. Arguably, prospective purchasers were left at a disadvantage in terms of environmental remediation expenditures.

The tax incentive is applicable to properties that meet specified land use, contamination, and geographic requirements. To satisfy the land use requirement, the property must be held by the taxpayer that incurred the eligible expenses for use in a trade or business or for the production of income, or the property must be properly included in the taxpayer's inventory. To satisfy the contamination requirement, hazardous substances must be present or potentially present on the property. To meet the geographic requirement, the property must be located in the one of the following areas:

- EPA brownfields pilot areas designated before February 1997
- Census tracts in which 20 percent or more of the population is below the poverty level
- Census tracts that have populations under 2,000, have 75 percent or more of their land zoned for industrial or commercial use, and are adjacent to one or more census tracts in which the poverty rate of 20 percent or more
- Any empowerment zone or enterprise community (and any supplemental zone designated on December 21, 1994)



Both rural and urban sites may qualify for the tax incentive. The taxpayer must obtain a certification from the state environmental agency that the property is in a targeted area. The Brownfields Tax Incentive expires after 3 years, thereby covering eligible costs incurred or paid from the date of enactment until January 1, 2001. Sites on EPA's NPL are excluded.

#### **4.5.6 Equity Participation**

Many communities consider equity participation an excellent tool for stimulating projects. That effort can take the form of lease arrangements, establishment of reclamation banks, or municipal ownership and development of property on its own behalf. The important aspect of equity participation is that the public sponsor assumes part of the risk of the project. For many communities, the risk is worthwhile because the assessed, cleaned up, and redeveloped property will provide a source of tax revenue. In addition, although state and local governments enjoy only a statutory liability exemption when acquiring property involuntarily, federal regulators have historically been more reluctant to pursue legal action against public agencies than against private landowners, a fact that reduces the risk.

#### **4.5.7 Lender Issues**

Lenders traditionally have been hesitant to make loans secured by contaminated properties. In the past several years, however, larger banks, insurance companies, and even some smaller banks and other lenders have become more knowledgeable in environmental matters. Consequently, in certain circumstances, they are more willing to make loans secured by contaminated property. For the potential borrower, then, it is crucial to understand the factors that a lender will consider when deciding to make such a loan. Moreover, to obtain a loan secured by contaminated property, the prospective borrower should demonstrate to the lender at least a basic understanding of the environmental risks involved in the loan transaction. While each individual lender has its own lending policies, every lender shares some primary concerns in these cases, including:

- The extent to which the environmental liabilities will impair the borrower's ability to make timely payment on the loan
- The extent to which the environmental condition impairs the value of the property as collateral for the loan in the event the borrower defaults
- The extent to which the lender may be exposed to direct cleanup costs in the event of foreclosure or other adverse action



Generally, a lender looks to a borrower's operating income as the first source of funds for repayment on a loan. Operating income is often referred to as the borrower's capacity and is typically measured by rental income on the property or profits generated by business operations conducted on the property. If a borrower is forced to fund an expensive site investigation or cleanup or pay damages to third parties, such as neighboring property owners, those environmental liabilities may be so high in relation to the borrower's operating income that they impair the borrower's capacity to repay the loan. After operating income, a lender will look to the borrower's liquid assets, such as cash in the bank from past business operations, as a source of repayment. Such assets are often referred to as a borrower's capital. Liquid assets are distinguished from the property that secures the loan. In evaluating a potential loan on contaminated property, a lender must initially ask the following questions:

- What is the likelihood that the borrower will be forced to incur investigation or cleanup costs during the repayment period, or suffer other environmental claims from third parties?
- Does the property generate enough operating income to satisfy both the environmental costs and the loan payments?
- If not, does the borrower have additional liquid assets sufficient to satisfy those costs?

To minimize their liability related to redevelopment of contaminated sites, bankers have taken two major steps:

- They have increased their scrutiny of real estate loans by requiring detailed environmental assessments and other site investigations, which in turn increase transaction costs
- They have restricted their interaction with borrowers to reduce liability exposure

Phase I and II environmental site assessments are required routinely for sites at which known or suspected contamination problems are present. The investigations increase the processing time for loans, and they add to transaction costs for borrowers. Lenders also seek indemnification from sellers for any preexisting contamination. Indemnification agreements often address issues related to cleanup expenses and the costs of fines, third-party claims, the determination of "reasonable" costs, cleaning standards, and limits on potential liability.

Lenders have changed their views about the redevelopment of contaminated sites affecting the prospects of reuse for specific sites and contributing to a shift in the broader climate for lending on these properties. Financial institutions grappling with issues of contaminated property, collateral value, and credit-worthiness of borrowers remain reluctant to lend on redevelopment projects, but approaches of lenders have evolved from an earlier concern based on unfounded fears about lender liability. More banks appear to have acquired the



expertise to distinguish between the real and the perceived risks associated with lending for the redevelopment of contaminated sites. With increased expertise, more banks have adopted environmental risk management programs to help limit their exposure, making redevelopment lending more attractive.

Some lenders insist on several underwriting "rules" that limit their own exposure to risk, but also make private financing more easily accessible and more predictable for other parties in a development project. Predictability is a major consideration for developers and investors. The underwriting standards typically include:

- Low loan-to-value ratios to ensure that collateral value will still exceed loan amounts even if undetected contamination and cleanup liability reduce property values
- Professional assessment of environmental remediation costs and potential liability, which cannot exceed 40 percent of property value
- A cleanup contingency of at least 15 percent to cover surprises (with more lenders encouraging the use of insurance for that purpose)
- An agency-approved cleanup plan and schedule before most project funds are advanced (with projects in states that have recognized voluntary cleanup programs often given support on this factor)
- A transaction structure and documentation that includes appropriate indemnifications, warranties and representations, and notifications

Some lenders have gained sufficient confidence in the quality and credibility of state voluntary programs that they now, at least informally, use state assurances when determining whether or not to make a loan for a contaminated site redevelopment project.

#### **4.5.8 Investor Issues**

Private investors and companies associated with the redevelopment of contaminated sites use an acquisition strategy that allows them to recapture value from environmental properties through the right combination of cleanup, redevelopment or repositioning of the property, and insurance. Through this process, they may be able to recapture substantial value from properties that have high inherent worth by completing remediation and managing residual risks.

The investors work with parties involved in the transaction to determine their financial, risk management, and general corporate objectives. They typically use a detailed screening process to evaluate properties for acquisition, and then develop a comprehensive risk management strategy for acquired properties. The asset evaluation process typically addresses several aspects of the proposed transaction, including real estate



attributes, environmental conditions of the property, suitable risk management strategies, financing alternatives, and the business structure through which the property would be acquired and redeveloped.

The investor often takes an equity position in the transaction, working with the established debt and equity sources to take investment positions in the project. The investor will require that finance costs, including the cost of land purchase, site cleanup and restoration, insurance placement, and other carrying costs are secure before making the investment.

To determine the specific requirements for each transaction, investors evaluate the management of environmental and financial risks, including the property conditions, the deal structure, and the liability concerns of buyers and sellers. Risk management factors include the selection of remedy, regulatory options (including voluntary cleanup or prospective purchaser agreements), the legal structure of ownership, and investment participation.

Investors use a variety of transaction tools, including bonds, indemnities, guarantees, escrows, environmental insurance, and other mechanisms, to control and limit financial, technical, and liability risks. These mechanisms, in combination with innovative insurance programs and risk management strategies, limit project risks for investors.

The remediation strategy for a property is a component of the overall risk management for the transaction. To develop the remediation strategy, the investor must analyze the adequacy of site characterization, then develop additional data as needed, and negotiate closure requirements with the lead environmental agency. Once cleanup goals have been established, the investor selects a remediation technology that will accomplish the cleanup in the most timely and cost-effective manner possible to maximize their cash flow and profit. When the remediation has been completed and regulatory closure attained, the property can be restored to productive use.

The investor uses an analytical market-profiling approach to determine whether a property is positioned for its highest and best use. The profiling assesses the real estate attributes of development constraints and the nearest-term, highest, and best alternative uses for the property. The profiling analysis includes:

- Analysis of historical use of the property
- Forecast of end-user demand and the repositioning time line
- Current and future major statistical area (MSA) and submarket trends
- Market characteristics, such as infrastructure, demographics, and labor force
- Industry growth sectors in the regional and the trade area



The results of the profiling define the ideal use of the property and determine whether it is feasible to reposition the property in the market place. The end-users are identified, and an action plan for marketing the property is developed. Real estate that is poorly positioned in the marketplace will still be of little or no value, even after the environmental contamination has been removed. Environmental property transactions should be presented to the capital markets, developers, and potential end-users both directly and through brokerage intermediaries. The process begins as soon as the property is placed under contract, as the investors view the process as an essential element of due diligence.

#### **4.6 Insurance Issues**

The development of environmental insurance (EI) in the past four years has reduced the risks associated with redeveloping contaminated sites. Insurance products permit economic risks associated with redevelopment to be quantified. Investment decision making therefore becomes easier for developers and other equity investors. At the same time, insurance provides lenders with a level of certainty that ease investor access to debt capital. Three broad categories of coverage are relevant to owners and developers of contaminated sites: cleanup cost cap (CCC), pollution liability (PL), and secured creditor (SC) policies.

##### **4.6.1 Insurance Improvements**

Representatives of the insurance industry report an increased demand for EI over the past few years as a result of such factors as a highly active real estate market and the refinement of EI products. The increased demand has provided the industry the opportunity to make the following improvements in insurance products:

- **Increased Policy Dollar Limits** - Maximum limits have increased considerably. Five years ago, a maximum limit of \$4 million U.S. dollars on a PL policy was a rarity. Today, policies having limits of \$200 million U.S. dollars may be provided by a single carrier.
- **Longer Policy Periods** - The standard policy period used to be only one year. Today, a policy can be written for 10 to 15 years or even longer in some cases.
- **More Flexible Coverage** - Insurers are more willing to tailor their policies to individual business needs by waiving exclusions and adding coverage to address unique features of redevelopment project risks.
- **Broader Coverage** - The scope of policy protection has expanded. For example, CCC policies now cover contaminants that were not identified in a remediation plan. Examples of coverage under PL policies that was not available three to four years ago include onsite remediation coverage for the insured, protection for damages arising from known prior pollution conditions, property value diminution



protection for the insured, and coverage for contractual liability and business interruptions caused by environmental problems.

- Less Stringent Site Assessment Requirements - Insurers today tend to rely on existing site data and rarely charge a separate fee for their own engineering assessments.
- Lower Costs - Costs for redevelopment insurance has decreased. However, the costs of CCC policies may rise in the future as insurers begin paying more claims and find that their loss ratios mandate premium increases.

The prices of individual policies vary greatly. Many considerations influence the cost of a policy, such as:

- Extent and nature of contamination
- Adequacy of the environmental site characterization performed
- Intended land use
- Maximum dollar limit, time limit, and deductible included in the policy
- Other factors based on decisions made by the purchaser

For example, a decision to proceed with a cleanup before obtaining approval of the state regulatory agency generally will increase the cost of a CCC policy covering that cleanup, since the coverage presents a greater risk to the insurer in terms of possible requirements for cleanup beyond that identified in the remediation plan.

#### **4.6.2 Cleanup Cost Cap Policy**

A CCC policy, also referred to as cost overrun or remediation stop-loss insurance, protects against cost overruns above the estimated cost of a planned cleanup at a redevelopment site. The premium for the policy is based on a percentage of the estimated cleanup cost. The insurer pays for costs that exceed the self-insured retention (SIR) or "buffer" to be paid by the insured. For example, on a planned \$2 million U.S. dollar cleanup with a \$200,000 U.S. dollar SIR, the policy begins paying for costs after the insured party has spent \$2.2 million U.S. dollars (the original cost plus the \$200,000 U.S. dollar). Risks associated with redevelopment that generally are covered under a CCC policy, are presented in Section 4.6.5, Table 4-2, Risks Covered Under Insurance Policies at the end of Section 4.6.



#### 4.6.3 Pollution Liability Policy

PL policies also are referred to as pollution legal liability, pollution and remediation legal liability, brownfields restoration, environmental response compensation and liability, commercial property redevelopment, real estate pollution, or real estate environmental liability, and other labels. Some insurance carriers offer more than one PL policy relevant to redevelopers of contaminated sites.

PL policies provide protection for costs that result from a pollution condition that can be pre-existing (either unknown contamination or known contamination disclosed at the time the policy is written) or current (releases that occur during the policy period). The coverage may be categorized into three basic components. The first consists of protection for the costs of third party claims arising from a pollution condition. The second provides protection for first party cleanup costs and other expenses related to a pollution problem. The final component involves legal defense costs associated with the first two components. Following is a brief explanation of each component:

- Third Party Claims - Claims that refer to assertions, such as lawsuits, alleging legal responsibility for damage; third parties may include private parties and government entities enforcing environmental regulations. The damages may occur onsite (on the property designated in an insurance policy) or offsite (at locations beyond the boundaries of the insured property such as nearby parcels where pollution has migrated, disposal sites, and properties damaged during transportation of contaminants).
- First Party Cleanup Cost - Coverage that entails protection for the insured against the expense of onsite cleanup and related expenses such as business interruptions and property value diminution resulting from pollution. Cleanups may be for newly discovered contaminants that were not addressed in an initial planned cleanup and for cleanup of pollution arising from ongoing operations. Also included, is a mechanism that often is referred to as "reopener" coverage. That coverage provides insurance for the costs of additional cleanup ordered by environmental regulators or compelled by law after a cleanup has been completed and a state agency has provided an assurance such as a no further action letter. As noted, such assurances generally indicated that further cleanup was not required at the time the assurance was written. However, they always include a statement that reserves the right of the agency to re-open a cleanup if circumstances at the site change (such as a modification of property use) or if changes in environmental regulations mandate cleanup levels that are more stringent than those employed in the initial cleanup.



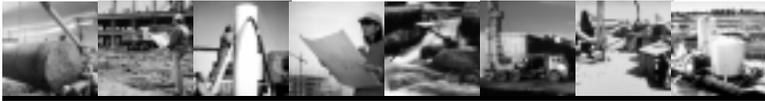
- Legal Defense Costs - These expenses can be substantial, even if the insured is not a major contributor of contamination on a site, in part because of the imposition of joint and several liability and in part because of the complex mix of federal, state, and local regulatory oversight that applies to any given property. The policies generally indicate that the carrier has both the right and the duty to defend the insured. The costs of such defense are included in the policy dollar limits.

Risks associated with redevelopment that are generally covered under a PL policy are presented in Section 4.6.5, Table 4-2, Risks Covered Under Insurance Policies.

#### **4.6.4 Secured Creditor Policy**

While liability concerns associated with federal requirements were addressed under the 1996 Lender Liability Law, there remain two primary concerns about loans on contaminated sites. First, the ability of the borrower to repay a loan may be jeopardized by unanticipated and extensive cleanup costs. Second, in the event of foreclosure, a lender may not be able to recoup the loan amount if the value of the collateral property has been eroded by actual or perceived contamination, either before or after completion of mitigation.

During the 1990s, insurance companies began offering SC policies to address these concerns. As with PL policies, SC policies offer protection against the costs of third party bodily injury and property damage claims arising from contamination and legal defense costs to defend against these claims. In addition, they provide reimbursement for loan payments if a borrower defaults as well as compensation to the lender for collateral value loss caused by a pollution condition. From the perspective of redevelopers of contaminated sites, the policies are important because they make lenders more willing to provide capital because SCs basically serve as loan guarantees. Risks associated with redevelopment that generally are covered under an SC policy, are presented in Section 4.6.5, Table 4-2, Risks Covered Under Insurance Policies.



#### 4.6.5 Risks That Are Covered

**Table 4-2. Risks Covered Under Insurance Policies**

Type	Coverages/Risks
Cleanup Cost Cap Policy	<ul style="list-style-type: none"> <li>• Discovery of higher concentrations and greater extent of contaminants than identified in the cleanup plan</li> <li>• Discovery of contaminants that were not identified in the cleanup plan</li> <li>• Changes in regulatory requirement</li> <li>• Legal defense associated with unanticipated cleanup</li> </ul>
Third Party Claim Costs	<ul style="list-style-type: none"> <li>• Offsite remediation of pollution emanating from insured's property</li> <li>• Offsite bodily injury caused by pollution emanating from insured's property</li> <li>• Offsite property damage caused by pollution emanating from insured's property</li> <li>• Offsite property value diminution caused by pollution emanating from insured's property</li> <li>• Offsite business interruption loss caused by pollution emanating from insured's property</li> <li>• Contractual liability due to pollution</li> <li>• Natural resource damage</li> <li>• Onsite bodily injury caused by onsite pollution</li> <li>• Onsite bodily injury caused by pollution emanating from adjacent properties</li> <li>• Onsite property damage caused by onsite pollution</li> <li>• Claims due to contamination at or emanating from a known, non-owned disposal site where contaminants were taken</li> <li>• Claims due to contamination at or emanating from an unknown, non-owned disposal site where contaminants were taken</li> <li>• Release of contamination during transportation</li> </ul>
First Party Cleanup Costs	<ul style="list-style-type: none"> <li>• Additional remediation, due to regulatory change, of known pollution after cleanup (re-opener coverage)</li> <li>• Remediation, due to regulatory changes, of known pollution originally thought not to require remediation</li> <li>• Remediation of previously unknown, pre-existing pollution</li> <li>• Remediation of current pollution from ongoing operations</li> <li>• Property value diminution due to onsite pollution</li> <li>• Business interruption loss due to onsite pollution</li> <li>• Delayed construction costs due to onsite pollution</li> <li>• Remediation of pollution emanating from adjacent property</li> <li>• Property damage due to pollution emanating from adjacent property</li> <li>• Property value diminution due to pollution emanating from adjacent property</li> <li>• Business interruption loss due to pollution emanating from adjacent properties</li> <li>• Delayed construction due to pollution emanating from adjacent property</li> </ul>
Legal Defense Costs	<ul style="list-style-type: none"> <li>• Defend against third party claims arising from cleanup</li> </ul>



Type	Coverages/Risks
Secured Creditor Policy	<ul style="list-style-type: none"> <li>• Compensation for collateral property value diminution resulting from contamination</li> <li>• Reimbursement for loan payment losses due to borrower's default</li> <li>• Cost of third party bodily injury and property damage claims as a result of site contamination</li> <li>• Contract damage costs results from contamination</li> <li>• Business interruption costs resulting form contamination</li> <li>• Remediation costs at sites owned by banks</li> </ul>

#### 4.7 Legal Issues

Basic legal frameworks consist of the statutes and regulations that establish the rules under which redevelopment transactions take place. One primary concern in redevelopment of contaminated sites is assurance by the states that affects the legal liabilities of redevelopers. Following, are questions used to evaluate the effectiveness, efficiency, and fairness of the legal framework.

- Does the legal framework for ownership, transfer, and redevelopment of contaminated sites protect public health and safety? Remediation standards should neither discourage investment, nor fail to protect public health.
- Does the legal framework establish clarity in remediation standards and assignment of liability and establish monitoring and reporting requirements that allow relatively efficient transactions?
- Does the legal framework shield purchasers and lenders from liability for contamination that occurred before the sale of the property? Access to state programs should not be substantially different in the various metropolitan areas of a state, nor should charges or fees under the state program have disproportionate impact on particular classes of property.

##### 4.7.1 Purchase Agreements

The question about whether a potential buyer will be liable for past contamination and who is responsible if more contamination is discovered after cleanup can cause barriers in the redevelopment process. To resolve such concerns, EPA developed two commonly used agreements: PPAs and comfort letters.

##### 4.7.1.1 Prospective Purchaser Agreements

As discussed earlier, PPAs are agreements between EPA and potential, or prospective, purchasers of a contaminated site. Under a PPA, EPA agrees not to recover future costs from the purchaser in exchange for an



agreement by the purchaser either to perform or to pay for an agreed-upon portion of the site remedy. The model PPA provides a template for EPA or a purchaser to use in developing a site-specific PPA.

EPA publishes its intention to enter into a PPA in the Federal Register. Federal Register notices provide a general overview of EPA's authority to enter into the agreement, name the parties to the agreement, and outline the terms and conditions of the agreement, including the action to be taken by the prospective purchasers and payments to be made to EPA. The notice also provides a point of contact for additional information.

#### **4.7.1.2 Comfort Letters**

EPA may issue comfort letters to prospective purchasers of contaminated properties when the purchasers request information about future liability at a site. Comfort letters clarify the likelihood EPA will be involved at a site or identify whether a party is protected by a statutory or discretionary enforcement policy. While the letters do not release purchasers from future liability, they do describe what EPA currently knows about potential contamination at the site.

A majority of concerns can be addressed by providing information known about a particular property to EPA, with an explanation of the relevance of that information to the agency. Consequently, EPA has adopted a policy on the issuance of comfort letters, which established criteria for issuing such letters and contains the following four sample letter types:

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

#### **4.7.2 Disclosure Requirements**

When selling property, owners may be obligated to disclose certain problems. In most states, it is illegal to fraudulently conceal major environmental impairments or physical defects of a property. States are increasingly



requiring sellers to take a positive role by making written disclosures on the condition of the property mandatory. For example, California has stringent disclosure requirements. California sellers must give buyers a mandatory disclosure form listing defects in the property. In addition, California sellers must disclose potential hazards from floods, earthquakes, fires, environmental hazards and other problems in a Natural Hazard Disclosure Statement.

Generally, owners are responsible for disclosing only information within their personal knowledge. However, full disclosure of any property defects will provide the owner protection from legal problems from a buyer who seeks to rescind the sale or sues for damages suffered because important information about the property was carelessly or intentionally withheld.

### **4.7.3 Environmental Covenants**

A covenant is a restriction on the use of real estate, such as a requirement that the property will be used only for residential purposes. Covenants are found in deeds or in documents that bind everyone who owns land in a particular development.

EPA has been working with states and municipalities to develop guidance that will provide some assurance that, under specified circumstances, prospective purchasers, lenders, and property owners do not need to be concerned with Superfund liability. The guidance clarifies the liability of certain parties' association with and activities at a site, and present clearly EPA's decision to use its enforcement discretion not to pursue such parties. EPA anticipates that these clear statements of their position will alleviate any concerns parties may have in becoming involved in the cleanup and redevelopment of previously used properties.

EPA issued guidance describing their policy of not pursuing cleanup costs from those lenders who provide money to an owner or developer of a contaminated property, but do not actively participate in the daily management of the property. The guidance also clarifies what is meant by "involuntary" acquisition by a government entity.

#### **4.7.3.1 No Further Action Letter**

After a site assessment determines that cleanup action is required at a brownfield property, a state can inform a property owner of the level of cleanup that is necessary before a no further action letter can be issued. The letter is granted only after a cleanup has been completed or a site assessment has determined that no cleanup is necessary. The letter does not release the new owner from liability, but does guarantee that the state will not take any new enforcement actions at the site, barring discovery of information unknown at the time the letter was issued. When an approved cleanup has been completed, a no further action letter is a promise by the state not



to require further cleanup. If state cleanup standards change, or new cleanup technologies are developed, the new owner will not be required to do additional cleanup.

#### **4.7.3.2 Covenant Not to Sue**

EPA issued guidance outlining situations under which the agency may enter into an agreement not to file a lawsuit against a purchaser of property that was contaminated prior to the purchase. In such a situation, EPA can issue a covenant not to sue (CNTS). A CNTS offers protection from future suits by the state for contamination found on the property. In some states, the CNTS may not cover conditions or contaminations that were unknown at the time the covenant was granted. In some cases, a CNTS may be contingent on an approved land use for the property. For example, the state may require that the property be maintained in industrial use or that the new use will not exacerbate contamination that already exists.

#### **4.7.3.3 Certificate of Completion**

A certificate of completion is issued after cleanup if the site meets the state cleanup standards that were agreed upon. In some cases, the standards will be individually negotiated for each site, based on a risk assessment. In other cases, the standards will be voluntary cleanup standards that apply to all sites statewide. The certificate of completion proves to prospective purchasers that the cleanup has occurred and that the state environmental agency participated and was satisfied with the results. In many states, possessing a certificate of completion limits further liability for both PRPs (laws vary by state on a PRP's eligibility for such a certificate) and parties that do not bear responsibility.

#### **4.7.4 Third Party Liability**

As discussed earlier, Third Party Liability is an important insurance issue. In addition to liability risks that insurance can help reduce, a redeveloper (and perhaps other associated financial stakeholders) may obtain from federal and state government officials, an appropriate release from possible liability to the government or clarification of potentially disputable legal or factual matters. Such releases or clarifications may be incorporated into PPAs, CNTSs, no further action letters, comfort letters, and the like. The documents likely will be tailored to the specific facts about the specific site and likely will be contingent upon adherence by the redeveloper to certain specific conditions or commitments.

Accordingly, such documents may provide some legal comfort to those involved in redevelopment, but they may not always be available on acceptable terms, they are not uniform from site to site, and they provide protection only against possible liability to the federal or state governments that co-sign the agreement.



If an individual involved in the redevelopment was in some way legally liable for the original contamination at the site, that individual could enter into a CERCLA settlement with EPA under CERCLA, which can provide protection against claims by third parties for further financial contributions towards cleanup of the site.

New statutory provisions insulate financial institutions from liability unless they become active managers of the property in which they hold a security interest. This statutory protection should help to alleviate certain concerns that lenders have had about potential liability under CERCLA.

However, one type of third-party liability poses a special concern. No legal mechanism exists at present (at either the federal or state level) to totally insulate the redeveloper, its financial backers, or other major participants in the redevelopment of contaminated sites from possible liability to a third party who claims to have been injured by contaminants that originate on the sites. Such an injured third party may exercise legal rights under CERCLA or applicable state law to seek damages or another remedy against the redeveloper. Financial stakeholders in redevelopment projects can decrease liability risks through:

- Competent site assessment and due diligence before initiating clean-up and construction activities which can minimize the risk of third-party claims by determining the facts about the nature and extent of contamination of the property and prospects for historical or prospective migration of contaminants to off-site locations
- Indemnification provisions or releases from liability under specified circumstances, often contained in major commercial contracts, may provide some legal and financial comfort to the major participants
- Insurance coverage also is commercially available to cover third-party environmental damage claims and expenses resulting from such claims

## **4.8 Community Issues**

As discussed in the previous sections, there are considerations that should be addressed when beginning a redevelopment project. One such consideration is the various and differing issues of community involvement in a project.

### **4.8.1 Community Relations and Public Involvement**

Members of the community should be seen as equal partners in dialogue about the redevelopment of hazardous waste sites. Community members need to know all pertinent details about the project to evaluate its importance,



costs, and benefits, and should be encouraged to participate in all aspects of environmental decision-making. Active and extensive outreach, for example, through presentations in printed articles and voice media and on the Internet, should be implemented to make the public aware of the project. The communication process should include site-specific technical information about the project before it is implemented and should continue throughout the duration of the project.

The following steps are suggested approaches for setting up and implementing an effective community participation program:

- Identify individuals to be contacted, including those directly affected by the redevelopment project. Pay particular attention to the identification of groups that do not traditionally participate in the redevelopment process, such as minority and low-income communities.
- Establish education programs or means to access data, or both, so that groups or individuals can obtain timely, accurate information that enables them to have a meaningful influence in decision making.
- Customize materials to ensure cultural sensitivity. Provide a facilitator at public meetings who is sensitive and trained in dealing with cross-cultural exchanges.
- Develop sponsoring and co-planning relationships with community groups, ensuring them shared roles in developing agendas, setting of goals, and providing leadership and outreach.
- Plan meetings that are accessible and accommodating. Meetings should be held in locations accessible by public transportation. Consideration should be given to such issues as childcare, access for the disabled, and language interpreters. Plan schedules to accommodate the needs of the affected communities, for example, holding meetings after usual working hours. Create an atmosphere of equal participation.
- Maintain clear goals by setting an agenda.

#### **4.8.2 Environmental Justice**

EPA defines environmental justice as "the fair treatment of people of all races, cultures and incomes with respect to the development, implementation, and enforcement of environmental laws, regulations, programs, and policies. Fair treatment means that no racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from the operation of industrial, municipal, and commercial enterprises and from the execution of federal, state and local, and tribal programs and policies."

Debates about reuse of hazardous waste sites include discussions about the environmental justice movement. That movement has been growing in strength over the past decade as local residents seek to remove sources of



toxic contamination from neighborhoods and prevent new sources from entering those neighborhoods. These communities are seeking a new paradigm of clean communities and clean jobs; that message is similar to that of those who advocate waste reduction, conservation, pollution prevention, recycling, and other measures of industrial efficiency as steps in protecting manufacturing jobs and community health.

#### **4.8.3 Political Considerations**

Political considerations in the redevelopment of contaminated sites include the political realities that affect the redevelopment area. For example, in some cities, requests for zoning changes are channeled through local government representatives. Therefore, plans for redevelopment of a site which alter the basic land use, must be approved by local government officials. Other political considerations may include how the municipality views industrial retention and job creation. In addition, a redevelopment property may lie within an EZ/EC, a TIF district, or a district designated because of historical significance. It also is important to consider the power that local governments have over redevelopment projects at hazardous waste sites. The following are examples of the roles that local governments can play in the redevelopment of a contaminated site.

Local governments are in a unique position to consider the redevelopment of hazardous waste sites in the context of the broader plans and needs of the community. Because of that perspective, the local government can act to encourage redevelopment projects that fit into those plans. A local government also can assist in identifying high priority sections of its jurisdiction and focus efforts to redevelop hazardous waste sites and to foster other development on those areas.

Local government officials should engage citizens in the decision-making process, provide them with good and timely information, and seriously consider their views. To accomplish this, local governments often establish advisory or ad hoc community groups or work with existing community groups to address redevelopment of hazardous waste sites. Collaborative planning and consensus-building approaches ensure equitable and meaningful community involvement.

Local governments can help match properties with prospective reusers, both through general efforts to provide information about the properties and by identifying specific potential reusers for particular redevelopment properties.

Local governments can use their own resources to fund portions of redevelopment costs. Such funding is particularly useful if it covers such up-front costs as those for property inventory, assessment, remedial action, and preparation of properties. Local governments often have the resources to locate the owner of a redevelopment property who has the potential to provide funds for cleanup. Other types of financial benefits,



such as tax incentives and infrastructure subsidies, also can be used to encourage reuse. In addition, both state and federal governments maintain programs that can pay for some of the costs of redevelopment of hazardous waste sites and reuse of property. Local governments can inform private-sector parties about such programs, apply for programs that require local government involvement, and identify ways to integrate various funding.

Local governments can serve as a link between private companies and community groups, as well as state and federal environmental agencies. Local governments also can work with agencies to ensure that they handle regulatory issues promptly and in a way that reflects local concerns. In some cases, local governments may agree to take on liability for remedial action at properties at which the perception of liability is preventing development, quickly removing the primary deterrent to reuse.

To prevent the creation of future hazardous waste sites, local governments can implement such controls as restrictions on groundwater use; offer incentives that discourage development of untouched land; change mixed-use zoning laws in low-income, residential neighborhoods; and assist state and federal agencies in monitoring compliance during the operation and closure of industrial complexes.

#### **4.8.4 Local Revitalization Programs**

The sheer number and cost of hazardous waste cleanups has led to a reaction against conventional hazardous waste remediation programs at both the federal and the state levels. The number of VCPs and hazardous waste site initiatives has risen dramatically in response.

In most neighborhoods, there are institutions that are respected and viewed as voices of the community. Among such organizations are government-like redevelopment agencies, block clubs, neighborhood economic development organizations, religious or educational institutions, and local chambers of commerce.

#### **4.8.5 Social Stigma**

Although stigma is generally referred to as an intangible factor, it has very real consequences in the marketplace that affect a contaminated property's value. For example, stigma may cause lenders to finance less of the project cost to offset the increased risk created by uncertainty about direct costs. Similarly, purchasers may demand price discounts above and beyond the estimated cleanup costs and other direct costs to account for the uncertainty of those costs. The decrease in the loan amount and discount in purchase price beyond direct costs is referred to as a "risk premium." However, the value of contaminated property should be expected to increase as uncertainty about cleanup costs and other direct costs decrease.



Environmental stigma is the result of an undesirable event that disrupts the balance of an environmental system. When environmental features are viewed as repellent, upsetting, or disruptive, they are stigmatized as undesirable. Such an environmental stigma can have a number of causes. One source of stigma is the presence of technologies, such as petroleum processing and nuclear power plants and high-voltage or transmission lines. A second source of environmental stigma is such activities as the transportation of hazardous materials, the development of hazardous materials storage sites, or the underground storage of petroleum products. The third source of stigma arises from the nature of products themselves, when activities at a site have involved use of petroleum-based products and agricultural products associated with a health risk.

In addition, past contamination can cause stigma in many intangible ways, even if no residual contamination remains on the property. Perhaps the most important intangible factor is the public perception of formerly contaminated properties. The unavoidable reality is that the public will attach a stigma to a property that has any history of contamination and the market reacts to that public perception, even if the perception is unsubstantiated.

Stigma may result from direct causes, such as increased incidence of cancer, decreased environmental quality of the workplace as a result of air or noise pollution, decreased occupancy in an apartment building, or decreased market value of single-family residences located adjacent to a sanitary landfill. Stigma can also result from indirect causes. For example, the location of a property near a contaminated property can be a sufficient factor to hinder financing or marketing of the property.

A stigma may apply to a property that is directly impacted by contamination. For example, a buyer may refuse to buy or a lender may refuse to lend on a property which houses or has housed a LUST, even if the cost of cleaning up the property is a small fraction of its value. Factors that can influence the degree to which a property becomes stigmatized are presented in Table 4-3.

**Table 4-3. Factors of Stigma**

Factor	Explanation
Responsibility	Deals with the degree to which the responsibility for the stigmatizing event can be placed squarely on the shoulders of a person or entity.
Media exposure or risk amplification	Deals with the extent of media coverage of the stigmatizing event. The more exposure in the media, the greater the level of awareness, which has an influence on the behavior of the buyer.
Disruption	Deals with the extent to which a contaminating event may alter a person's or a firm's everyday activities.



Factor	Explanation
Concealability	Deals with the concealment of a contaminating event. If contamination is concealed, it has a more dramatic impact on market behavior, and therefore, on value.
Aesthetic effect	Deals with the degree to which the natural environment, of some other physical feature, is defaced by the contamination.
Prognosis	Deals with the degree to which the contaminated site can be cleaned up and is influenced by two prognosis factors. The first is severity and the second is persistence. How bad is the problem, and how long will the contamination be present?
Peril	Deals with the degree to which human health or the health of the environment might be affected.
Fear	Deals with the stress that results because of the contamination. Even if a population's physiological health is not affected, mental health can be affected by contamination.



## 5.0 NEXT STEPS

The U.S. and German bilateral agreement will enhance each country's capabilities for cleaning up hazardous waste sites through the sharing of information about innovative redevelopment approaches, promoting development of innovative technologies, improving the quality of technology evaluations, and introducing technology developers to international markets. In addition, international partnerships, such as the one established under the bilateral agreement, allow each country to learn about the other's environmental regulations, policies, and guidelines. Such understanding may influence the evolution of redevelopment regulations in each country and may help to establish standards in the redevelopment process on an international level, thereby further encouraging developers to enter international markets.

This report was developed to establish a baseline of U.S. redevelopment issues and approaches to addressing each of those issues. This report was presented during the bilateral planning meeting in April 2000. During the meeting, redevelopment goals of the U.S. and Germany, approaches for obtaining those goals, and common areas of interest were discussed. As a result of the meeting, a feasibility study is being conducted in each country. The goals of the studies are to: 1) identify redevelopment issues and areas of interest common to both the U.S. and Germany, and 2) develop feasible goals (goals that can be accomplished and could yield useful tools and techniques to accelerate the redevelopment of contaminated sites) that both parties agree to work toward. The feasibility studies will be conducted in four steps.

**Step 1 - Conduct Interviews:** Conduct interviews with selected stakeholders to obtain a greater understanding of the issues associated with redevelopment and the approaches used to address those issues.

**Step 2 - Develop Report:** Prepare a preliminary feasibility report that presents an analysis of the issues presented in this report as well as the issues identified during the interviews conducted in Step 1. The report will suggest feasible goals that the U.S. and Germany could address to overcome the barriers to redevelopment and present possible work plans for those goals.

**Step 3 - Conduct Workshop:** Conduct a workshop that brings together stakeholders from the U.S. and Germany, including those interviewed during Step 1, to share lessons learned and present case studies about and innovative approaches to the redevelopment of contaminated sites. The workshop is planned for Winter 2000.

**Step 4 - Conduct Meeting:** Hold a joint meeting between the U.S. and Germany to discuss findings from the steps mentioned previously, finalize a list of feasible goals, and develop a work plan for Phase III that identifies the steps necessary to obtain those goals.



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