Industrial Site Reuse and Urban Redevelopment—An Overview

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Abstract

Many communities have experienced wrenching plant downsizing and shutdowns, leaving underused or abandoned—and almost always contaminated—industrial sites, called brownfields*. The issue of brownfield cleanup and redevelopment is emerging as central to the overlap between environmental protection and economic redevelopment. Unless these buildings and sites are restored to useful life, continued deterioration will worsen environmental problems and weaken the economic base of the host communities. Local decisions and strategies to restore these sites can be strengthened by Federal action to reduce regulatory barriers to reuse and to expand the availability of existing resources to brownfield projects. This article proposes steps the U.S. Department of Housing and Urban Development (HUD) could take to help facilitate local reuse initiatives. It also suggests topics for additional research as HUD expands its focus on the interplay between the urban environment and economic redevelopment.*

During the past two decades, the Nation has experienced a major shift in its industrial base. Traditional heavy manufacturing has given way to light manufacturing and specialty production requiring smaller and more compact factories. Changing markets, international competition, and advances in production technologies have driven this trend. Many communities have experienced wrenching plant downsizings and shutdowns, leaving underused or abandoned industrial sites, commonly called *brownfields*, in their wake. Virtually every community in the United States has a declining or closed industrial site within its boundaries. Once-thriving factories, mills, and machine shops lie underused or abandoned.

Yet many of the sites that once housed large industrial operations and employed thousands of workers could be productive again. Rehabilitated and decontaminated, these properties have the potential to house emerging technologies and manufacturing processes. Adapting them to new uses could restore not only the buildings and their physical environment but also the jobs and vitality of the communities surrounding them. Because many

of these sites are in central cities, revitalization would particularly benefit low-income and minority residents who have suffered the economic and health consequences of living near blighted buildings and contaminated lands. Reuse also can take advantage of existing infrastructure systems and thus reduce suburban sprawl. By returning these facilities to productive use, cities can create jobs, boost tax revenues, and produce numerous social, environmental, and esthetic benefits.

Chief among the obstacles to productive reuse of the sites is environmental contamination. In some situations, owners have "mothballed" land and buildings, allowing them to sit idle rather than grappling with the challenges of reuse. In other cases, owners have simply abandoned their properties, allowing them to revert to the public domain. As a result local governments, often facing their own financial crises, are forced to deal with the problems of contamination and decay if they want to return the facilities to productive—and tax generating—use.

The obstacles, while daunting, are gradually being confronted by Federal, State, and local governments; development organizations; and private interests. They have found that the problems of reuse often are outweighed by the benefits of returning the structures and properties to productive use. In Elizabeth, New Jersey, for example, the State's Economic Development Authority redeveloped a 106-acre tract along Newark Bay that had been the site of the world's largest sewing machine factory. The Singer Manufacturing Company had closed the factory, eliminating thousands of jobs, jeopardizing nearly $500,000 in annual tax revenues, and undermining plans for nearby waterfront development. After cleanup and minor improvements to the structures, the property was subdivided and sold. It now houses 9 new businesses that had been priced out of the commercial market and provides more than 1,500 permanent jobs.

The scarcity of large tracts of unused land in central locations and the inability to annex adjacent areas has prompted some cities to look closely at reusing old factory complexes. Many firms actually prefer the convenience of these older sites. In Cambridge, Massachusetts, proximity to several major universities was an important factor in the successful conversion of a former rubber hose factory to a complex of small biotechnology and other research and development enterprises. Reusing older industrial buildings in urban areas also helps reduce suburban sprawl and the accompanying land use and environmental impact. Building on previously developed land rather than untouched tracts reduces the potential for damaging groundwater and wetlands and for introducing traffic congestion and other by-products of development. In larger cities, old industrial complexes are often located near mass transportation and therefore are more accessible to economically disadvantaged persons, who have a greater need for public transportation to get to and from work.

Scope of the Problem

Although it is difficult to determine the actual number of underused or abandoned industrial complexes, there is no doubt that the problem is significant. Some experts have suggested that more than 500,000 sites nationwide have a level of contamination that could trigger regulatory concerns and make it difficult for their owners to sell the sites, secure financing, or proceed with reuse. Problems that typically plague these facilities, such as structural deterioration and environmental contamination, are virtually impossible to quantify beyond the community level. Listings of vacant industrial and commercial space are readily available but include only properties for sale or for lease, not those that were withdrawn from the market. Vacancy rates do not reveal the importance of a particular site to the local economy, nor do they convey its social or historical significance. Unless a

property has been inspected, it is impossible to know whether it is contaminated, although the likelihood is very high if the facility housed an industrial operation prior to 1980.

Large metropolitan areas such as Boston, Chicago, Cleveland, and New Orleans have considerable difficulty grappling with these problems. Small cities, having few resources available to help with redevelopment, often fare much worse. They can be economically devastated when a plant shuts down, and the local labor force may lack transferable skills, limiting community efforts to attract a different business to the site.

Of all the major environmental statutes that affect land use and development decisions, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (42 U.S.C. 9601 et seq.) and its funding arm, the Hazardous Substances Response Fund (Superfund), are the primary guide to public officials and private parties as they cope with site contamination. However, it is essential to distinguish between Superfund high-priority sites and sites characterized by low and medium levels of contamination. To date, the U.S. Environmental Protection Agency (EPA) has identified approximately 1,200 National Priorities List (NPL) (CERCLA section 101) sites, the true environmental nightmares bearing significant health and safety risks and requiring considerable time and resources to restore. Sites with low or medium levels of contamination, called *brownfields*, usually are easier to clean up and offer greater short-term opportunities for reuse.

Technology plays an increasingly prominent role in the brownfields issue. Because detection technologies have become more precise and sophisticated, more industrial sites are being identified as contaminated and subject to CERCLA, and fewer site purchasers can legitimately seek exceptions through the "innocent landowner" defense based on "all appropriate inquiry." Although new remediation technologies can result in faster, better, and more cost-effective cleanups, the existing CERCLA legal and regulatory framework for assigning liability and cleanup responsibility—further shaped by judicial interpretation—sets up an adversarial situation that often impedes the application of these new technologies.

The convergence of environmental and economic development concerns comes at a critical time for local officials struggling to craft community revitalization strategies targeting old industrial areas. These officials must address a wide range of problems as exemplified by the following:

- Property owners who are unable to sell contaminated properties may simply abandon them, thereby undermining the local tax base.
- Vacant facilities deteriorate, inviting unsupervised stripping of machinery or materials, vandalism or arson, and "midnight dumping" of contaminated substances.
- Pollution that goes unabated may worsen and spread, further diminishing a property's value and adding to cleanup costs, posing a health threat to the community, and undermining the economic viability of adjoining properties.
- Contaminated sites often become unwanted legal, regulatory, and financial burdens on communities and their taxpayers.

The public and private sectors increasingly recognize the need to address these environmental and community problems, but doing so is not easy. The complicated procedural and legal steps of testing, cleaning, and reusing older industrial sites can be expensive and time-consuming. This article describes the environmental and financial barriers to cleanup and redevelopment and provides a series of community-based case studies that illustrate

the potential for success. It also reviews public-sector financial incentives and suggests issues for further research.

The Impact of CERCLA on Brownfield Development

CERCLA, enacted in 1980 and amended in 1986, is perhaps the most significant environmental statute affecting cleanup and transfer of contaminated properties. CERCLA affects industrial site reuse in several ways. First, it holds present and past owners or operators of a property responsible for the costs of cleaning up "any release or threat of release of hazardous substances," as defined in the law. These parties are responsible even if they did not cause the pollution. Because of the liabilities, prospective purchasers generally require that any property with even a remote chance of harboring contamination receive a complete environmental investigation. If a site is contaminated, purchasers often demand that it be cleaned before they buy or lease it. Unfortunately, cleanup is rarely easy or inexpensive, and contamination can trigger a number of technical and legal issues.

In addition to liabilities imposed on present and past owners, CERCLA poses two major problems for the lending community. First, lenders are concerned about the loss of collateral value if real property used to secure a loan is found to be contaminated. Second, the lenders themselves can be found to have participated in the management of a site, by virtue of the conditions of the loan, through foreclosure, or as a result of some other arrangement, thus making them liable under CERCLA. Although lenders have seldom been held accountable, the potential for liability is a major concern for lending institutions. This risk to lenders can affect a company's ability to secure financing for property cleanup and renovation or retrofitting.

The statutory language establishing lender liability is vague, and a series of court cases has not clarified the issue but has instead caused considerable confusion and uncertainty about the circumstances under which lenders can be required to pay for cleanup. Consequently, lenders have become cautious about financing potentially contaminated properties, sometimes refusing to redevelop any property associated with hazardous waste, even if the property has been cleaned. Since virtually every industrial process involves some use of solvents, lubricants, and other chemicals, the issue of lender liability can have a significant impact on efforts to reuse industrial facilities.

Perspectives on CERCLA's impact on brownfield redevelopment vary broadly. Testifying before Congress, EPA officials have emphasized that the agency does not want "to discourage unduly the redevelopment of old industrial property" and have declared that CERCLA liability needs to be "as certain and predictable as possible." (Testimony of Carol M. Browner, EPA Administrator, June 4, 1994.) Some economic development proponents are using the liability issues as leverage to modify existing environmental protection responsibilities. Others contend that lender and developer skittishness allows contamination to go unchecked, since companies are unable or unwilling to secure the financing needed to carry out cleanup strategies. In general, environmentalists maintain that CERCLA helps bring about private-sector participation in the assessment and cleanup processes, establishes workable partnerships between business and environmental interests, and encourages economic activity compatible with broader environmental and public interest objectives. Some local government agencies view environmental concerns as just one of several quality-of-life factors that influence the direction of development from older inner cities into exurban areas.

CERCLA Concepts and Rationale

Congress enacted CERCLA in late 1980 in response to the public health, environmental, and financial threats posed by hazardous waste sites, notably the highly publicized prob-

lems at Love Canal in New York State and Times Beach, Missouri. When the $1.6 billion Superfund was approved, experts thought the hazardous waste problem was limited to fewer than 400 sites nationwide. Contamination, however, has proven to be much more pervasive.

CERCLA imposes liability on individuals, companies, and other entities that generated or arranged for the disposal of hazardous waste, and on landowners and operators of facilities containing deposits of hazardous materials. Under the law, liability is retroactive to past actions that caused the problems in question. CERCLA also provides a mechanism for the Federal Government and private parties to respond to existing or potential contamination at any site. Specifically, CERCLA authorizes the Federal Government to:

- Spend monies from the Superfund to clean up sites that EPA has placed on the NPL—currently, about 1,200 of the approximately 30,000 contaminated sites on the full EPA list.
- Order responsible parties to carry out a cleanup.
- Take legal action to recover cleanup and related costs from persons, companies, and organizations identified as potentially responsible parties (PRPs).

CERCLA also permits third-party suits in which private parties file suit against other parties to recover cleanup and other costs. In addition to identifying and dealing with NPL sites, CERCLA requires PRPs to notify authorities and to clean up any hazardous substance release that equals or exceeds an EPA-designated level. CERCLA defines *release* as "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment." If the PRP does not conduct an adequate cleanup, EPA can finish the cleanup, recover its cost, and assess punitive damages in excess of the costs. Because a Superfund cleanup can cost millions of dollars, the threat of a CERCLA enforcement action is not taken lightly.

One of CERCLA's primary goals is to ensure that polluters pay for cleanup. Congress recognized that private persons or entities that contributed to—or failed to prevent—contamination should bear primary financial responsibility. Public resources were to be used as the last resort for abandoned properties whose owner could not be found. EPA can seek reimbursement from all PRPs and considers each party's degree of culpability as well as its ability to pay.

CERCLA Liability and Exceptions

CERCLA defines PRPs broadly, with the current owners and operators of a facility being identified first. Other PRPs include former owners and operators; persons who arrange for the disposal, treatment, and shipment of the hazardous substances found at the facility; companies that transport, store, or dispose of hazardous waste; and—most significant for reuse initiatives—companies or individuals that own or acquire contaminated land or sites. These categories include the individuals and organizations most able to discover and clean up contamination. Under CERCLA, *facility* refers not only to buildings but also to land, equipment, pipes, ponds, lagoons, ditches, storage containers, and motor vehicles.

In crafting CERCLA, Congress recognized that a broad definition of owner/operator was needed to minimize the potential for evading responsibility through loopholes, but it also realized that such a wide net could lead to unfair situations, particularly for investors and lenders who were neither responsible for nor aware of contamination at the time they acquired the property or provided financing. As a result, lawmakers created two exceptions to the wide-ranging definition of liability. The first exception, added to CERCLA in

a 1986 amendment, is known as the "innocent landowner's defense." (CERCLA section 107.) It allows property owners who "did not know and had no reason to know" of any contamination at the site to be free from liability as long as certain conditions are met. Congress specified that the phrase *had no reason to know* means that the new owner "must have undertaken, at the time of acquisition, all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice." Thus, Congress made it clear that the interpretation could vary in different situations.

While the term *all appropriate inquiry* is critical to the way EPA and the courts have interpreted this amendment, neither EPA nor the courts has offered clear guidance as to how much inquiry is considered appropriate. Increasingly sophisticated pollution detection technologies further complicate the interpretation of this provision. In addition, the lack of clear standards has been intimidating and frustrating to potential purchasers and lenders. At a hearing of the U.S. House of Representatives Committee on Small Business, a witness likened the search for an innocent landowner to Diogenes' search for an honest man: If contamination is discovered, the innocent landowner defense does not apply, but if it is not found, the owner is thought not to have made all appropriate inquiry.

The second exception to CERCLA liability is a statutory exclusion covering lending institutions that have only limited involvement in the operation of a property, either as its creditor or as its owner following foreclosure. This exception, frequently referred to as the *secured creditor exception (SCE)*, was designed to accommodate conventional underwriting and lending practices. Although lender liability is not the only issue in the complex relationship between environmental concerns and economic development, it is clearly an important one. During the past 5 years, this issue has become a lightning rod, attracting diverse proposals and sparking considerable debate.

Lenders' concerns focus on security interests: CERCLA provides that a lender is not liable as long as it does not participate in managing that facility, although it might hold an ownership interest in the property to secure the loan. As originally envisioned, this provision is key to the SCE concept. But the statutory language defining SCE is vague, and subsequent judicial interpretations have further clouded its applicability. In particular, the stipulation that a lender not "participate in the management" of a facility has spawned considerable legal debate. CERCLA does not define this phrase, and the judicial interpretation of *participate* has formed the core of the current lender liability debate. Successive court decisions have indicated a lender must prove that it is entitled to claim the secured creditor exemption.

A critical 1990 judicial decision created considerable turmoil in the banking industry that persists to this day. In *United States* v. *Fleet Factors Corp.*, the U.S. Court of Appeals for the 11th Circuit broke with existing precedent and held that a secured creditor could be liable under CERCLA if its involvement in a facility's management is "sufficiently broad to support the inference that it could affect hazardous waste disposal decisions if it so chose." The court found that "it is not necessary for the secured creditor to actually involve itself in the day-to-day operations of the facility in order to be liable." (901 F.2d 1550 (11th Cir. 1990).) Representatives of the American Bankers Association (ABA) testified before Congress that the *Fleet Factors* ruling created a broader standard of lender liability than previously existed, one which "is sending shock waves through the lending community." (David Steinman, vice president of real estate credit recovery, Mellon Bank, statement before the Subcommittee on Commerce, Trade and Hazardous Materials, Committee on Commerce, U.S. House of Representatives, June 2, 1995.) Lenders argue that the ruling, despite CERCLA's explicit exclusion for lenders that hold a security interest in property, implies

that lenders are owners of property because of the nature of their financial relationship with the borrowers. Lenders also object to the further implication that they can be held liable for cleanup efforts.

In predicting the impact of *Fleet Factors* on financing of economic development, it is important to view the court's ruling in its proper context. In this case, EPA alleged that Fleet Factors, which had foreclosed on a defunct cloth printing facility and was selling off the equipment used to secure its loan, had complete control of the property. During the period of control, the court found, Fleet handled barrels of hazardous waste and removed machinery in a way that released asbestos. In filing suit, the Federal Government sought to recover $400,000 in costs paid by Superfund to clean up the site during the time that Fleet held title to the property.

In explaining its ruling, the court cited the need to interpret vague statutory provisions broadly enough to achieve CERCLA's cleanup goals. Anticipating the reaction of the financial industry, the court indicated that its narrow interpretation of SCE eligibility still allows a lender to monitor any aspect of the borrower's business or even to become involved in "occasional and discrete" financial decisions pertinent to the lender's fiduciary responsibility to protect its security interest. The court emphasized that its interpretation of liability should not discourage lending to such enterprises; rather, the interpretation should encourage financial institutions to examine more vigorously the environmental practices of prospective borrowers. The court also suggested that this ruling would encourage bankers to consider CERCLA liability risks, from the beginning, as part of the terms of the loan agreement.

The court's explanation notwithstanding, one reason why the *Fleet Factors* ruling has been so unsettling to lenders is that although some involvement in a borrower's financial affairs does not, by itself, limit SCE eligibility, situations in which a lender's involvement is significant enough to influence hazardous waste disposal decisions might preclude a claim for the SCE. That is, the court decided in *Fleet Factors* that a secured creditor may be liable "if it participated in the financial management of a facility to a degree indicating a capacity to influence" disposal activities. Because of this ruling some lenders, wishing to avoid liability, now choose not to participate in any of their borrower's decisions, financial or operational. Such a course of action, though, deprives small businesses—often in need of considerable technical assistance—of important financial advice that the lender has the expertise to provide. For some companies, this lack of lender involvement might mean that an otherwise solvable financial problem leads to business failure.

Lender liability concerns cut across public and private financial, economic development, and environmental interests in a way that is almost unique. Because the issues are still evolving and court rulings have varied, it is useful to review the various perspectives of EPA, the lending community, and environmentalists on this matter. Obviously, the views of other parties, such as local government and industry, are important, but it is clearly these three sectors that shape current considerations.

EPA's viewpoint on lender liability. As noted previously, EPA officials have testified before Congress in support of the principle that CERCLA liability needs to be as predictable as possible and should not unnecessarily impede financial transactions. While EPA does not want to discourage redevelopment of old industrial property, the agency has expressed concern about proposed lender liability legislation that would significantly extend lender immunity. In the agency's view, a revised definition of *owner* or *operator* should permit lenders to foreclose on property and conduct loan workouts to protect their security interest without triggering CERCLA liability. However, EPA contends that such provisions should also foster responsible behavior by lenders when they make an initial

loan or when they discover contamination upon foreclosure. EPA officials have testified that, if a lender is acting in a custodial capacity when administering and winding down the affairs of a borrower or is otherwise proceeding to transfer the property to a new owner, actions taken to manage or dispose of the property responsibly upon learning of contamination should not trigger liability.

Lenders' viewpoint on their liability. Banks and individual lenders maintain that it is in the public interest to encourage lenders to help their customers address pollution problems and clean up site contamination rather than discouraging them. In their view, therefore, the SCE provision must be interpreted in a way that protects lenders from liability in loan workout situations. Lenders fear being targeted as "deep pockets" for paying cleanup costs. The crux of lender concern is the judicial ruling in the *Fleet Factors* case, which bankers maintain goes beyond a reasonable interpretation of CERCLA and ignores the practical realities of traditional lending practices. The Mortgage Bankers Association (MBA) has argued that the new test places an undue burden on bankers. If taken to the extreme, MBA suggested, the ruling could unreasonably force lenders to investigate the business policies or waste treatment systems of potential borrowers. MBA contends that lending institutions, particularly those in rural areas and small towns, have little or no staff capacity to assume such a role and would have to curtail lending drastically if forced to do so.

According to ABA, the potential for lenders to be held liable for cleanup costs caused by borrowers' misdeeds is affecting commercial lenders and others who use real estate as collateral. At best, many borrowers face greatly increased loan transaction fees and other costs as the lending community grapples with the provisions of CERCLA; at worst, some companies are losing their financing altogether. Many bankers have indicated that businesses in sectors viewed as environmentally risky—for example, manufacturing operations or service industries such as gasoline stations and dry cleaners—will find it difficult to secure financing when using their property as collateral.

Moreover, some lenders point to changing State statutes as a further deterrent to site reuse. Recent amendments to Michigan's Environmental Response Act, for instance, broaden the definition of the commercial lending community, so that liability now can extend to insurance companies, retirement funds, domestic and foreign banks, motor vehicle finance companies, and even government agencies authorized to have security interests in real property. Extending liability to government agencies could discourage cities and States from using or promoting certain programs, such as those offered by HUD, the Small Business Administration, or other Federal agencies.

Environmentalists' viewpoint on lender liability. Despite the fears of lenders, many environmental, environmental justice, and local community development groups maintain that existing CERCLA provisions are appropriate to the level of risk posed by hazardous waste contamination and that CERCLA cannot be blamed entirely for disinvestment or other negative economic consequences. Some environmental organizations, including the Sierra Club and the U.S. Public Interest Research Group (U.S. PIRG) and its State affiliates, fear that legislative proposals to clarify and narrow the extent of lender liability will remove an important incentive for financial institutions to play a key role in identifying contaminated sites and expediting their cleanup. Environmental justice advocates worry that liability reforms will further burden low-income and minority residents of inner cities.

Environmentalists have supported the reasoning in *Fleet Factors*, arguing that the court's decision appropriately encourages lenders to investigate the environmental practices of prospective borrowers carefully. Banks, they note, now recognize that borrowers with

poor environmental practices reduce their property's collateral value. A decade of experience with CERCLA has made it clear that environmental evaluations and other inquiries that lenders now perform routinely have helped reverse longstanding environmental abuses at thousands of older industrial and commercial sites.

U.S. PIRG contends that CERCLA has created powerful market incentives for the private sector to discover, clean up and—in the future prevent—toxic contamination. U.S. PIRG and other environmental groups point out that the private sector has assumed a major role in identifying contaminated sites because of concerns about acquiring contaminated property through foreclosure or losing collateral through liability fears that would make lenders decide not to foreclose. Nearly all lenders now commission environmental evaluations of property before making loans, in order to identify existing and potential problems. New York's attorney general has testified that CERCLA's due diligence defense and secured creditor exception adequately protect lenders while serving the broader public interest.

Environmentalists also argue that lender liability plays a major role in preventing site contamination, because financial institutions have a strong incentive to refrain from lending to operations that are likely to pollute. Because few companies are able to self-finance, this loan underwriting practice helps stop contamination before it starts and may even help some companies obtain financial assistance to adopt pollution prevention practices and technologies.

Some environmental and community development organizations, as well as some local governments, have a different perspective on the extent to which liability concerns influence lending decisions. The Southeast Michigan Council of Governments, for example, launched the Regional Development Initiative (RDI) in 1990 to identify the causes of—and possible solutions to—urban sprawl, which is expected to consume 40 percent of the region's remaining open space by the year 2010, despite a projected population growth of only 6 percent. The RDI oversight committee found that quality-of-life issues such as crime, falling education standards, and racial disharmony are the major factors driving developers, businesses, and homeowners out of older urban areas and into greenfields (open space at the fringe of metropolitan areas). The fringe communities' need for infrastructure places a double burden on older communities. A portion of their taxes, which might otherwise have helped to clean up their brownfields, goes instead to build infrastructure for those who have fled. RDI concluded that real or potential environmental contamination may be the official reason given by lenders for refusing to finance brownfield cleanup and redevelopment, but it is by no means the only reason.

The Impact of Other Federal Environmental Statutes on Brownfield Development

Although CERCLA is widely regarded as one of the critical regulatory programs that affect the cleanup and redevelopment of industrial sites, a number of Federal statutes pertaining to air quality, transportation, land use, and water protection present important considerations for State and local entities. An understanding of these laws can help decisionmakers position brownfield redevelopment on their lists of economic development and environmental protection priorities and obligations.

Clean Air Act Amendments of 1990

Amendments to the Clean Air Act (CAA) require States to develop and submit a State Implementation Plan (SIP) for EPA approval. Among other requirements, the SIP must outline State plans for meeting air quality improvement goals. For the so-called dirty air

areas of the country, which include about 112 metropolitan centers classified as "nonattainment areas for health-based criteria air pollutants," CAA Sections 110 and 173 require a "preconstruction review process" prior to all new construction to help owners determine the level of air pollution control technology needed on site. Once a determination has been made, a maximum available control technology (MACT) is specified in the facility permit.

These pollution control requirements, which are important for brownfield redevelopment, are more stringent for new construction—including construction in greenfields—than for modifications of existing facilities or new construction in urban areas. In the latter two cases, offsets in emissions levels can be negotiated among polluting facilities to avoid exceeding the overall net increase in emissions allowable in that area. If a company chooses not to pursue an offset arrangement, it can instead install pollution controls to keep emissions below regulated levels. CAA's goal of "prevention of significant deterioration" of air quality is targeted at maintaining clean air in areas that have it. This underlying purpose should, in theory, help target development toward developed areas. According to some experts, however, the threshold for proving the potential for significant deterioration is so high that a proposed facility or development would need to operate at unrealistically polluted levels in order to trigger the regulatory constraint.

Some experts acknowledge that the level of local government familiarity with CAA regulations varies greatly across the country, leading to widely diverging views of appropriate development priorities. The Disney America proposal to create a historical theme park in Northern Virginia, for example, illustrated the constraints faced by individual States that fail to plan on a regional basis with neighboring States. In that case, the Virginia legislature approved permits, transportation enhancements, and other expenditures for the planned 3,000-acre theme park to be located about 25 miles west of Washington, D.C. But members of the Metropolitan Council of Governments from Maryland and the District of Columbia were forced to reconsider their approval of the project when they realized that the traffic congestion and resulting air pollution from the Disney park would have used up most of the incremental increase in emissions available to the region under the CAA. (Early, 1994.) Similarly, Denver proceeded with construction of a larger airport outside its city limits, despite proof that the airport could cause a significant deterioration of air quality in an area adjacent to a metropolitan area that was already badly polluted. (Ibid.)

EPA attributes roughly 50 percent of all airborne emissions to stationary sources such as factories and small businesses and 50 percent to mobile sources, primarily motor vehicles. Despite gains in controlling industrial air pollution, concerns about increased air emissions resulting from increases in vehicle miles travelled (VMT) will remain a factor influencing decisions about whether to redevelop urban lands proximate to mass transit services or to develop land on the urban and suburban fringe, where access is limited largely to automobiles.

Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA)

ISTEA (usually pronounced "iced tea") is regarded as a landmark law by transportation planners, community and environmental activists, and Federal lawmakers because of its comprehensive examination of transportation needs and the effect of those needs on a number of societal, economic, energy, and environmental factors. ISTEA also is credited with broadening the diversity of interests involved in transportation planning and priority setting. In addition to the traditional State departments of transportation (DOTs) and metropolitan planning organizations (MPOs, representing areas with populations of more than 200,000), ISTEA has extended participation to public interest groups, private-sector

companies involved in providing transportation infrastructure, and freight and transit services. The involvement of these new parties is an important factor in efforts targeted at brownfield cleanup and redevelopment and open space preservation.

Under section 134(f) of ISTEA, Federal certification of MPO transportation plans requires consideration of 15 factors, including:

- The consistency of transportation planning with applicable Federal, State, and local energy conservation programs, goals, and objectives.
- The need to relieve existing congestion and to prevent its occurrence in other areas.
- The likely effect of transportation policy decisions on land use and development, and the consistency of transportation plans and programs with the provisions of all applicable short- and long-term land use and development plans.
- The overall social, economic, energy, and environmental effects of transportation decisions.

ISTEA also requires that transportation implementation plans (TIPs) concur with the SIPs required under CAA. Both sets of plans were due between spring of 1994 and spring of 1995. States have been submitting them on an ongoing basis. Local planning officials and public interest groups interested in the connection between development decisions and environmental programs hope that the laws will promote preliminary, if not polished, attempts to address the complex issues of growth and sustainability.

Clean Water Act (CWA)

Clean water goals and brownfield cleanup issues converge chiefly in the area of wetlands protection laws (section 404 of the Clean Water Act) and legislative proposals to encourage a watershed-based approach to water protection. The emphasis is directed toward the consequences of sprawling development on water quality. Many States have their own wetlands protection laws, which increasingly discourage draining and encourage rehabilitation in order to protect biodiversity and the water supply. To date, wetlands protection efforts have focussed largely on the effect of agricultural activities, although developers of expansive projects increasingly are required to build around or restore wetlands.

If Congress reauthorizes CWA and includes a watershed-based approach to setting water quality standards, State officials expect more pressure to be exerted on development plans. Because new roads, parking lots, and housing developments—all major sources of nonpoint source pollution—would be recognized as potentially harmful to the watershed, redevelopment efforts might be directed back toward already developed urban areas, where existing water and sewer infrastructure could handle such pollution. These considerations, coupled with CAA's more stringent pollution control requirements on new development in clean air areas, could encourage the cleanup and redevelopment of brownfields.

The Role of State Voluntary Response Programs

Several States are trying to ensure a level playing field for the environmental review process by making it possible for all buyers to obtain a minimal amount of information on properties they intend to purchase. These States have enacted buyer protection programs, known as property transfer laws, for potential purchasers of industrial properties. The following discussion addresses selected State property transfer laws adopted in New Jersey, Connecticut, California, Illinois, and Michigan. It is not intended as an exhaustive analysis of all such laws; rather, these examples are provided to illustrate the varying

approaches States are pursuing and the way such laws can help reduce the guesswork in purchasing industrial properties and planning redevelopment.

New Jersey's Industrial Site Recovery Act

In 1983 New Jersey approved what was then the Nation's most stringent environmental cleanup law, the Environmental Cleanup Responsibility Act (ECRA) (N.J.S.A. 13:1K–6, et seq. (1983)). This law was designed to bring a level of certainty to the cleanup process and to ensure effective remediation efforts. ECRA provisions served as a model for subsequent efforts in other States. In 1993, partly in response to developer concerns about the amount of time required for the ECRA process, the State legislature revamped the program to loosen toxic cleanup regulations and modify review and compliance procedures. The new law, the Industrial Site Recovery Act (ISRA) (PL–1993, Chapter 139) was viewed by businesses and State regulators as an attempt to streamline and relax some of the requirements associated with real estate and environmental cleanup transactions. (Kravitz, 1995.)

ISRA has changed the former ECRA requirements in several important ways. It sets variable cleanup standards, depending on land use (industrial, residential, and so forth); allows businesses to defer action on cleanup if their property use stays the same; permits companies to seal off polluted areas with caps or fences, instead of removing contamination; provides up to $50 million in grants and loans to small businesses to assist with assessment and cleanup efforts; and allows some cleanup actions to go forward without specific oversight by the State's Department of Environmental Protection and Energy (DEPE).

ISRA applies to industrial establishments and, as with ECRA, compliance with its provisions is a precondition for closing many business and property transactions in New Jersey. The law also applies automatically when operations cease at an industrial facility. The ISRA-mandated process has five steps:

- Preliminary assessment, during which DEPE attempts to determine whether landlords or tenants are responsible for compliance.
- Site investigation, with guaranteed access to property—by court order, if necessary—for investigation and remediation.
- Remedial investigation.
- Development of a remedial action workplan.
- Remedial action.

ISRA permits deferral of cleanup plans for property being transferred to a new owner if the individual submits a cost estimate for cleanup and certifies that the preliminary assessment, site investigation, and remedial investigation have been completed. The new owner also must assure DEPE of his or her ability to pay for necessary cleanup and certify that the facility's operations will remain "substantially" the same. The law also allows parties to use a "certificate of limited conveyance" to transfer a portion of an industrial property (up to one-third of its total size) so that assessment and cleanup requirements are limited to the part of the property changing hands. This provision was included in response to concerns that selling one section of a property would lead to scrutiny of the entire facility. Finally, ISRA requires DEPE to establish different soil cleanup standards for residential and nonresidential uses.

ISRA's proponents view the statute as an important step toward striking a balance between economic development and environmental protection. However, environmentalists have

expressed doubts about the cleanup standards, fearing that they will hold some companies to less stringent requirements.

ISRA's Predecessor: New Jersey's ECRA. Every discussion of State property transfer laws begins with a comparison to ECRA, the first law of its kind in the Nation. Because ECRA proved so important in setting the stage for the actions of other States, an examination of its key provisions provides useful background information. ECRA stands apart from subsequent laws in terms of scope and stringency. It was crafted as a bold solution to a major problem that had begun to undermine site reuse and stifle economic activity in New Jersey's older industrial areas. In the late 1970s, State officials discovered that thousands of properties were contaminated with hazardous wastes. Although some of these sites had been used for illegal dumping or were contaminated through mishandling of toxic materials, a surprisingly large number simply had been the location of industrial operations where, over time, the accumulated chemicals in the soil and groundwater reached a level at which cleanup costs exceeded the value of the property.

ECRA's sponsors viewed the legislation as a sort of buyer's protection plan, because it, unlike CERCLA, was not triggered by environmental hazards or endangerment but was instead initiated by business and real estate transactions. After ECRA took effect, State officials rendered opinions on approximately 6,000 transactions each year. The law imposed preconditions on the sale, transfer, or closure of industrial establishments generating or otherwise involved with hazardous substances. It applied to a wide range of property transactions, as evidenced by its broad definitions. The terms "closing, terminating, or transferring operations," for example, were defined to include:

- Any change in ownership or use of a site, including those acquired through condemnation by local governments or authorized development organizations.
- Sale or transfer of stock as part of a corporate merger or consolidation.
- Cessation of all or part of operations for a period longer than 2 years.
- Financial reorganization, bankruptcy proceedings, and similar occurrences.

Owners or operators subject to ECRA were required to comply with a standardized process in order to proceed with a property transaction. The State actively oversaw all aspects of the process to ensure compliance—providing guidance on conducting environmental assessments, inspecting the site to ensure that the owner sampled all areas of concern, reviewing the sampling results and any cleanup plan, and certifying that the site had been cleaned to the required level. At the end of the ECRA process, sellers received a letter of compliance from the State certifying that the site was not contaminated and freeing them from liability for earlier contamination. The law also protected the seller from responsibility after the sale occurred, although the State reserved the option to reevaluate the file if further hazardous substances were discovered. ECRA did not relieve owners of liability for contamination that was discovered after the sale, but it did reduce the chance of contamination going undetected and being passed on to prospective buyers.

ECRA protected property buyers by making sure that the sites were clean. A developer who acquired a 75-acre industrial site in northern New Jersey said of ECRA, "Once you get through it, it's an advantage—anything that helps reduce the risk of liability for contamination." Initially, ECRA was criticized for being too intrusive and deleterious to real estate transactions, but many of those fears appeared to be unfounded. In fact, thousands of properties have been sold since the law's enactment.

In spite of these advantages, problems with the law ultimately led to its revamping and transformation into ISRA. Despite efforts by DEPE to speed processing of applications and inspections, transaction times were lengthy. As with many State government agencies, DEPE was understaffed. In addition, the length of time required to devise specific cleanup standards sometimes resulted in arbitrary decisions and confusion. Some industrial properties—especially those whose cleanup costs exceeded the value of the property—were neither sold nor closed, because no one wanted to pay for cleanup. Instead of ceasing operations altogether—an action that would trigger ECRA—some companies slowed production to a minimum. Thus, the jobs and tax revenues that could have been produced by full use of the property were lost while contamination went unaddressed.

In addition, ECRA placed the burden for cleanup on current owners, raising questions about the fairness of forcing costly cleanup operations on those who bought property before the law was implemented and were unaware of existing contamination. Equity issues were especially crucial for small business owners who found themselves saddled with contaminated property.

Connecticut's Property Transfer Program

Connecticut followed New Jersey's lead in 1985 by enacting its own Transfer Act (section 22a–134, et seq., of the Connecticut General Statutes). This law imposes notification requirements on property owners when transferring ownership of businesses that generate or are otherwise involved with hazardous wastes. Establishments covered by the law include those that "on or after May 1, 1967, generated more than 100 kilograms of hazardous waste per month" and any business that "recycled, reclaimed, reused, stored, handled, treated, transported, or disposed of hazardous waste generated by another person or municipality" on or after that date. In 1987 the law was amended to include dry cleaners, gasoline stations, furniture strippers, auto body repair shops, and painting shops that were in operation after May 1, 1967, regardless of the amount of hazardous waste generated.

The Transfer Act is triggered by transfers of ownership, which has come to mean a sale, because the statute has been interpreted to exclude lease changes and facility closures. Those who transfer property must submit one of three forms concerning hazardous materials releases at the site. If no release has occurred, the transferror submits a "negative declaration" to the Department of Environmental Protection (DEP) within 15 days of the property's transfer. If a release occurred and the property owner cleaned it up, the transferror submits a certification to that effect to DEP (including DEP documentation of its concurrence and a description of the cleanup approach), also within 15 days of the transfer. If unremediated contamination exists before the actual transfer, either party can submit documentation to DEP outlining a plan to clean it up and identifying the responsible party. One State official credited this program—in conjunction with an active site-discovery hotline and other notification abilities—with assisting in the development of an inventory of brownfield sites statewide. When the program was first implemented, Connecticut estimated that it had approximately 500 such properties. By 1994 the estimate had risen to about 1,500.

Unlike its New Jersey counterpart, Connecticut's DEP is not required by the Transfer Act to approve cleanup plans prior to a transaction. Some establishments in the State have been resold before DEP has approved the cleanup plan submitted for the original transfer. The seller is ultimately responsible for complying with the law, although buyers—and even lenders—may be penalized for not preparing necessary documentation. However, failure to comply with the law does not void the transaction. In practice, DEP has not had adequate staff to implement the Transfer Act fully. In most cases, the agency merely

acknowledges receipt of the forms and may not inspect the site to ensure that a cleanup has been done correctly until after the transfer. Approval of cleanup plans submitted as part of the process can take from a few months to 2 years. However, for sites that present a significant threat to health and the environment, such as contaminated drinking water, DEP has processed the submission within 180 days. Despite delays, the program provides some advantages to buyers, ensuring that they have at least minimum information about a site's past uses and contamination. Increasingly, companies are proceeding with their own cleanups, even though they risk future DEP disapproval of those cleanups.

In 1993 the State further augmented its efforts to recover brownfield sites by enacting legislation to establish the Urban Sites Remedial Action Program. Buttressed with 6 new staff members and $25 million in State bond funds to spur site assessment and cleanup, Connecticut currently oversees cleanup and redevelopment efforts at 9 publicly funded sites and 25 cleanups funded by responsible private parties. To be eligible for this program, a site must be located in a distressed urban area and have a high economic development potential. Although the program is targeted at encouraging private-sector development of abandoned industrial facilities, the legislation also contains language describing the State's attempt to preserve open spaces. Efforts to minimize sprawl and its associated environmental impact, as well as to conform to ISTEA objectives of maximizing existing transportation and other infrastructure in already developed areas, characterize Connecticut's understanding of the crucial link between policies that guide development trends in both brownfields and greenfields.

California's Notification Law

Although California has not yet passed legislation specifically requiring a site assessment or cleanup when property is sold, the notification law, enacted in 1987, creates a broad disclosure requirement for owners of nonresidential property. Before such properties can be sold or leased, the owner must inform each buyer or lessee in writing of any hazardous substances that he or she has reasonable cause to believe have been released onto the property, including groundwater pollution caused by an adjacent or other offsite source.

If the seller does not comply with this requirement, he or she can be held liable for damages. If the seller has actual knowledge of contamination and knowingly fails to inform the buyer, stiff civil penalties may be levied. In addition, the operators of a business or industry on the property have certain minimal obligations to investigate the presence of hazardous substances resulting from a release and must disclose the result of the investigation to the owner immediately. Although technically no threshold has been set for that which must be reported (even a drop of used motor oil or paint is considered a release), penalties are triggered only when the release is of a "material amount." Unlike New Jersey's ECRA, which influenced this statute, California's law does not require inspection before selling or leasing property. In fact, the law may encourage ignorance of site conditions, since owners are liable only for failing to report facts they should have known. However, because the law requires disclosure of facts that the owner "has reason to believe," even a little knowledge may trigger an obligation to inspect the site.

California has other mechanisms in place to add certainty to the environmental assessment process, including regulations covering the voluntary registration of environmental assessors. Candidates meeting certain minimum criteria may register with the State as assessors, although no standardized testing is required. The mechanisms were adopted to support environmental auditing of existing factories, which has as its goals improving the handling of toxicants, encouraging pollution prevention practices, helping businesses

comply with environmental laws and regulations, and inspiring public confidence in hazardous materials management.

Illinois' Responsible Property Transfer Act (IRPTA)

Lawmakers modified IRPTA to be more like the California statute after business interests objected to the original version's similarity to New Jersey's ECRA. Enacted in 1988 and effective in 1990, IRPTA was designed to increase awareness among buyers, sellers, and lenders of the environmental liability involved in property transfers. The act is also meant to create a public record of contaminated sites and stimulate voluntary private investigation and cleanups through increased awareness of the extent of those sites. However, the State did not want to impose excessive public agency intervention in accomplishing these goals and so established only limited procedural requirements.

First, the seller must provide all parties involved in the transaction with a disclosure document consisting of yes-or-no questions that deal with the site's current use but do not require details about past uses. The form also notifies the buyer that property owners may be held liable for costs related to releases of hazardous substances. Second, the seller must send the disclosure document to the county recorder of deeds within 30 days of the transaction. From then on, the document travels with the deed, so that anyone conducting a routine title search has access to the environmental condition of the property.

Initial reports show that sellers are submitting three times as many disclosure documents as actually are required by IRPTA. Many of these unnecessary filings result from sellers' uncertainty as to whether the statute applies to them; often they submit the completed form as a precaution. The law specifies that properties must comply if they contain an underground storage tank or a facility that either manufactures, imports, or uses hazardous chemicals and keeps them onsite.

As with Connecticut's Transfer Act, IRPTA does not require cleanup before a property is transferred. Businesses subject to the disclosure requirements are concerned, however, that they may become easy targets for future State-mandated cleanups. The potential threat of such action, they say, may encourage buyers either to demand that a property be cleaned up before a sale closes or to tender an offer that takes into account the possibility of mandated cleanup. Although disclosure is expected to trigger an environmental assessment, it is not required, nor do environmental audits of properties demand State approval. In addition, a transaction can be voided only before settlement has occurred, and only by the parties involved in the transaction. The State cannot interfere. Unlike programs in most other States, IRPTA is not overseen by the Illinois Environmental Protection Agency. The program is designed to be self-implementing, although stiff civil penalties may apply to those who knowingly provide false information.

Michigan's Environmental Response Act (MERA) and Amendments

The Michigan Environmental Response Act (MERA) of 1982, known as the Polluters Pay Law, sets general guidelines for the cleanup of contaminated sites, including abandoned or underutilized properties. It was amended in 1991 to impose strict cleanup standards and liability on the current and past owners and operators of these sites. Additional amendments, signed by the governor in June 1995, dramatically change the State's liability scheme and cleanup standards regarding contaminated property. MERA is now referred to as the Part 201 program under the Natural Resources Environmental Protection Act of 1994.

Strict and retroactive liability still pertains to potentially responsible parties (PRPs) that were generators or transporters of the hazardous materials at a contaminated site. However, the

amended law offers full liability protection to current owners and operators—and to local governments in some cases—who are not responsible for contamination at the site. Purchasers of contaminated property are not liable for existing contamination if they conduct a baseline environmental assessment (BEA) that quantifies the contamination of the property and submit the results to the Department of Environmental Quality (DEQ) within 45 days of purchase. This action will help the State distinguish between existing contamination and any caused after the new owner takes title to the property. Local governments that obtain properties through condemnation, gift, or purchase must follow the same steps. Liability protection also extends to purchasers and municipalities that have exercised due diligence as defined under CERCLA and MERA.

The amended law places "affirmative obligations" on property owners to report and remediate contamination at properties they have warehoused out of fear of triggering enforcement and liability actions. The purpose of these obligations is to return unproductive properties to the tax rolls and to remediate contamination that may be affecting public health or the environment. Failure to prevent the exacerbation of existing contamination or to exercise due care at a property which would return it to its intended use can result in fines and penalties.

The State has replaced its previous framework of cleanup standards with use-based criteria. DEQ must develop numerical standards for residential, recreational, commercial, and industrial property uses. The State will allow property owners and developers to use any combination of engineering and industrial controls—including zoning ordinances, record notices, and deed restrictions—to ensure that properties cleaned for a particular use remain subject to such use restrictions. Covenants not to sue are available to developers, provided they meet certain statutory criteria. A letter of determination, on the other hand, is available to anyone—including a municipality—who purchases a property and submits to DEQ an acceptable petition for protection from liability. The petition must describe the facility's proposed use, the BEA, and the planned response action (if necessary). The letter of determination can shield the petitioner from liability under MERA, other State laws, and CERCLA.

Additional laws were enacted in July 1996, when Governor Engler signed a five-bill package of legislation that will help provide a permanent funding mechanism for the State's environmental cleanup and redevelopment program. The underlying principles of the funding legislation are:

- Creating "pay-as-you-go" funding that would create no new debt and require no new taxes.
- Allowing for increased emphasis at the State and local level on redevelopment of brownfield sites, while continuing to focus on current funding priorities of protecting public health and the environment.
- Providing new local funding mechanisms.

In 1994, $20 million was appropriated for response actions at sites where the State is liable as owner or operator. In addition, $30 million per year in general funds is now available to finance DEQ's cleanup and redevelopment program. In July 1996, several new funding mechanisms for brownfields assessment and cleanup were signed into law, including the following:

Unclaimed Bottle Deposit Revenues. House Bill 5673 amends the "Bottle Bill" to place the State's share of unclaimed bottle deposit revenues (the State retains 75% and returns

25% to retailers) in a new Cleanup and Redevelopment Fund (CRF). The bill allows for $15 million per year from "past due" unclaimed deposits to be transferred to the new CRF over the next 3 fiscal years for appropriation to the DEQ, plus an additional $4 million a year from new bottle deposit revenues. Ten percent of the State's annual unclaimed bottle deposit revenues will be placed in a new Community Pollution Prevention Fund for grants to local governments.

State Cleanup Program/Cleanup and Redevelopment Fund. This fund is created by Senate Bill 919, which amends Part 195 of the Natural Resources and Environmental Protection Act to transfer money from the Environmental Protection Bond Fund into the CRF. DEQ will request an annual appropriation to support a wide array of brownfields cleanup and redevelopment activities.

Revitalization Revolving Loan Program. Funds will be made available to capitalize this new DEQ program, which offers loans to local governments for site assessment and demolition to "ready" the sites for cleanup and redevelopment.

Tax Capture and Tax Credit Mechanisms. Senate Bill 923 creates the Brownfields Redevelopment Financing Act to allow municipalities to develop and implement brownfields redevelopment financing plans (that is, tax increment financing plan or tax capture plan) to capture State or local property taxes from a contaminated site in order to conduct response activities at the site. Senate Bill 924 provides an important addition to the Brownfields Redevelopment Act. The bill provides taxpayers with a credit against their single business tax liability for certain contaminated properties if the taxpayer makes an economic investment at the site. The amount of an individual credit is 10 percent of the eligible investment costs the taxpayer has incurred to redevelop or expand the property in the tax year, with a $1 million cap on the total credits a taxpayer may claim.

In addition to the hazardous waste cleanup requirements and landowner protections of MERA, Michigan's Site Reclamation Program plays a key role in returning abandoned industrial sites to productive use and preserving undeveloped land. Established and funded under Act 328 and renamed after 1993 changes, the Environmental Protection Bond Implementation Act now provides up to $40 million for local governments to finance the cleanup of contaminated sites and an additional $10 million for site investigations. Grant amounts may not exceed $2 million. The law also requires the Michigan Department of Natural Resources (DNR) and the Department of Commerce, which award the grants, to consider whether the proposed application preserves open space.

Michigan's program is considered innovative in that it delegates authority and financing to local governments, which select potential sites based on the extent of contamination and the stated potential for economic redevelopment. However, critics of the program persuaded the legislature to make changes that lessened the burden on local governments to provide quantifiable proof of the certainty of economic redevelopment at these sites, considered the potential for job creation and the ability to use existing infrastructure, and recaptured State monies expended on the cleanup. Requiring up-front, secure commitments from developers, the critics argued, was an unfair and unrealistic burden for many local governments and blocked their legitimate access to the funding pool. As of September 1993 seven projects had been approved, for a total of $5.7 million, compared with the original $40 million authorized by the law and $29.25 million actually appropriated by the legislature.

Federal Efforts to Support State Programs

No fewer than 23 additional brownfields-related bills have been introduced in the 104th Congress. These bills, intended to stimulate and encourage the redevelopment of urban brownfields, offer a broad spectrum of reforms and incentives. Some propose expanded relief: regulatory relief, such as delegation to the States of Federal responsibility for "sign off" on cleanups; and liability relief to lenders, prospective purchasers, and local governments. Others offer financial assistance for State and local governments in the form of loans, grants, tax credits, and expanded tax-exempt financing. Still others would increase and formalize HUD's role in supporting redevelopment of urban brownfields.

The Clinton administration has set forth its own brownfields initiatives. Early in 1996 the administration proposed a brownfields tax incentive that would allow developers to expense their cleanup costs fully (that is, to make them fully deductible in the year in which they occurred). The estimated $2 billion initiative would be targeted to distressed urban communities—such as Empowerment Zones or Enterprise Communities—as well as to areas with high poverty rates.

Recently, President Clinton proposed a joint EPA-HUD brownfields initiative that builds on the tax incentive proposal. The initiative calls for enactment of the following: expanded EPA loans and grants for cleanup at the local level, expansion of HUD's Economic Development Initiative (EDI) to support brownfields redevelopment, new EPA worker training incentives for jobs in local remediation projects, and new assistance to State voluntary cleanup programs. While there is strong support in Congress for a brownfields redevelopment initiative, the common belief is that its enactment will have to await the 105th Congress.

Barriers to Brownfield Redevelopment

For decades, processing plants, steel mills, and other industrial facilities have contributed to the contamination of land, water, and air. Public awareness of the problem has increased in recent years, as have knowledge of the health and environmental risks and recognition that contaminants must be reduced or eliminated and past contamination cleaned. But despite the many benefits of site reuse, key barriers—such as the high cost of cleanup, uncertainty about liability and procedures, and a negative public attitude toward old facilities—also have intensified.

Cost of Environmental Cleanup

Cleanup adds to the cost of any redevelopment project, and often it adds significantly. Depending on the extent and type of contamination, these costs can total tens of thousands—and sometimes millions—of dollars. In most areas, but particularly in central cities, adequate financing to carry out cleanup and redevelopment activities is seldom available at affordable rates. The mere suspicion of contamination has increased lending costs more than threefold since 1980, according to some local development practitioners. Much time and staff work are required to structure financial packages, and prospective borrowers must pay for environmental assessments and detailed appraisals. Because these expenses are not easily recovered in the normal course of doing business, brownfield sites are at a tremendous competitive disadvantage compared with greenfield locations. Cleanup also requires considerable time, delaying project completion by months or even years. Delays are costly for developers, eating into the profitability of a project and undermining its economic viability.

Sites and structures for which expected financial returns exceed redevelopment costs, including cleanup costs, will continue to be reused. Economically marginal facilities, on the other hand, will lie dormant unless there is an additional incentive or assistance. For example, the developer of an inner-city property in Cleveland who converted an industrial warehouse site into a small neighborhood shopping center spent nearly $225,000 per acre for site testing, remediation, and preparation. He estimated that similar activities for a comparable project at a suburban greenfield site would have cost only $40,000 per acre. Nonetheless, he proceeded because he had the strong support of the city.

Uncertain Liabilities

Although CERCLA broadly defines potentially responsible parties, uncertainty still clouds many individual projects and deters reuse. Uncertainty about environmental liabilities hinders companies and communities from obtaining the financing needed to clean up properties and to perform retrofitting work. Private developers determined to acquire an old property often are rebuffed by lenders concerned about potential liability in the case of foreclosure, loss of collateral value, and the effect of cleanup costs on the project's economic viability. In numerous communities, the prospect of contamination at a project site has left companies frozen out of conventional credit markets.

Recognizing the unique role of lenders and investors, Congress included in CERCLA a specific exemption for persons who do not participate in the management of a facility but hold an ownership claim to protect their investment (as loan collateral, for example). Since CERCLA's enactment, several court cases have attempted to clarify what constitutes ownership and participation in the management of a facility. But, as indicated earlier, the *United States* v. *Fleet Factors Corporation* case raised uncertainties about the point at which lenders cross the threshold of ownership into participation in management. This court decision appears to have broadened the scope of liability significantly. Clearly, lenders' reluctance to make loans in this legal climate can affect reuse efforts drastically.

Unclear Procedures

Much confusion surrounds the identification of toxic substances at older sites, the best methods of treatment, the level of cleanup required, and the appropriate scope of public-sector review. This uncertainty persists even as environmental laws are amended, regulations are modified, and courts reinterpret the way they are applied. It is difficult to provide a satisfactory answer to the question of public officials, developers, investors, and neighbors of contaminated sites: "How clean is clean enough?" Clearly, some of their concerns can be traced to a lack of understanding of environmental laws and procedures, but others stem from the vagueness of this largely ill-defined regulatory arena. Still others raise legitimate questions about the wisdom of enacting variable cleanup standards that depend on the way the site will be used in the future. This uncertainty often intimidates developers and economic development officials and creates an adversarial relationship between environmental and community leaders.

Developers, economic development officials, and lenders also are nervous about the lack of guidance on ways to protect themselves from liability. Prospective owners may shield themselves under CERCLA's innocent landowner defense by conducting all appropriate inquiry prior to acquiring the property. To date, however, neither EPA nor the courts (through case law) has defined the requirements for *all appropriate inquiry*. Instead, EPA has stated that it will determine what is appropriate on a case-by-case basis. As a result of this imprecise language and lack of interpretation, lenders and purchasers are left to determine appropriate inquiry. Prospective landowners, particularly those with limited resources, are often uncertain about the steps they must take to ensure compliance with the letter

and intent of the law and to avoid possible liability. Lacking any guidance but their own limited or incorrect understanding of the requirements, they may conduct inadequate environmental investigations that complicate property transfers and hinder government efforts to identify and clean up contamination.

In some cases, prospective purchasers may not want to know the full extent of contamination at the site, adopting what one expert has called the "what they don't know won't hurt them" posture. In other cases, prospective owners are deterred from purchasing a property when they learn they must spend a substantial amount of money to find out whether the site is contaminated. Developers are concerned that even if they clean a property to current standards, they have no assurance that it will be considered clean enough in the future. They also fear that changes in environmental standards and improvements in technology may force them to revise their cleanup plans midway through a project, adding further costs and delays. Unfortunately, environmental laws, like tax laws, probably will continue to be moving targets.

The process of assessing hazards is further clouded by inconsistent licensing and accreditation of site assessors. The outcome of an assessment often depends on the judgment of the individual doing the assessment, especially when less visible subsurface contamination is involved. The Federal Government has no legal authority to certify, accredit, or otherwise license individuals in any profession, and States take varied approaches to training and certifying assessors. In Massachusetts, for example, the Department of Environmental Protection requires that cleanup of contaminated sites be supervised by a State-licensed professional who reports to an independent board and must take a certain number of hours of training each year to remain licensed.

Public Attitudes

Negative public attitudes toward older facilities also hinder reuse efforts. To many people, large, obsolete structures signify economic distress, reinforcing a sense of community decline created by the loss of industry and jobs. While industrial archeologists may see beauty in such buildings, developers see costly renovation problems and lack of economic viability due to outmoded facilities or new building code requirements. Moreover, few communities make a systematic effort to identify buildings that are worth saving, and few successful examples of reuse are well enough known or sufficiently replicable to convince developers to try it themselves.

These negative images may endure even after redevelopment has occurred, especially if contamination was extensive, because the public is skeptical about the ability of government or business to remove hazardous materials safely. Furthermore, advocates for low-income and minority communities often challenge policies that allow lower cleanup standards for industrial sites that are adjacent to their communities and may expose residents to toxic chemicals. For factories with substantial contamination, extraordinary efforts may be required to convince local officials and residents that the buildings are worth saving. In Lowell, Massachusetts, for example, persuading the community of the wisdom of converting dilapidated textile mills to office and retail use has required years of concentrated effort by local, State, and Federal agencies and huge infusions of Federal and State funds.

Impact of Brownfields on Economic Development Finance and Industrial Site Reuse

The increasing interplay between the economic and environmental arenas has emerged as one of the most prominent development issues of the 1990s. The way in which these

sectors mesh strongly affects the prospects for successful reuse and redevelopment in areas containing older industrial sites. Rightly or wrongly, the ambiguity of CERCLA liability issues has increased the uncertainty associated with lending. Heightened concern over environmental problems has introduced a new dimension to the risks that lenders face and the hurdles that developers and local agencies must overcome.

Although the likelihood of monetary hardship attributable to environmental liability is still small, there is no question that the issue has affected banking practices. Risk-averse by nature, bankers are showing great concern over the potential for liability, due in part to judicial interpretation of CERCLA's liability provisions. In a 1989 circular that was prescient for its time, the Federal Home Loan Bank Board outlined several "basic categories of risk" to lenders that could emerge from transactions involving environmentally contaminated property. These included:

- Reduced value of collateral.
- Inability of borrowers to repay loans if they also must finance site cleanup costs.
- Preemption of a mortgage loan security by a cleanup lien imposed under so-called super lien laws in force in some States.
- Potential for a bank to become liable for the cost of site cleanup if it forecloses on a property or to forego its collateral interest if it chooses not to foreclose in the face of significant cleanup costs.
- Possibility that the borrower will not maintain the facility in an environmentally sound manner.

In response to these real or perceived risks, lenders are changing the way they deal with projects that even remotely involve hazardous wastes. Financial institutions grappling with concerns over environmental liability and contaminated project sites have been taking many of the following actions:

- Sharply curtailing their level of lending.
- Cutting off financing for businesses, such as dry cleaners and automobile body shops, that routinely handle toxic substances.
- Requiring a thorough environmental assessment and cleanup, if necessary, as a condition of loan approval, thereby increasing transaction costs.
- Imposing restrictions on, or limiting interaction with, borrowers, in order to reduce their exposure to liability.

Changes such as these affect not only the reuse potential of specific sites but also the broader economic development climate in many locales.

Reducing Lending to Projects Perceived as Environmental Risks

From the lender's perspective, possible liability for significant damages has increased the risk of doing business. In an American Bankers Association (ABA) poll of small financial institutions (those with less than $250 million in assets), 43 percent of the responding lenders indicated that they had stopped making loans to companies associated with environmental contamination, and another 11 percent intended to curtail such lending.

In many areas of the country, lenders who might once have given cautious consideration to an industrial reuse project are tightening their lending policies pertaining to facilities and sites that might be contaminated. There is a growing unwillingness to provide any

financing to some types of businesses, unless the precise scope of a lender's liability is clarified. Throughout the country, but particularly in rust-belt cities, bankers repeat horror stories about industrial reuse projects gone awry for environmental reasons. For example, in 1981 a developer paid $3.5 million for an abandoned, 10-story Alcoa factory in Edgewater, New Jersey, just across the Hudson River from Manhattan, which he planned to convert to luxury apartments. However, when an inspection revealed massive polychlorinated biphenyls (PCB) contamination throughout the building, the project faltered. In 1991, Alcoa agreed to buy back the property—for $10. The developer defaulted on his loan and the lender, fearing liability if it moved to take the property, let it go.

Brownlining: Shunning Certain Project Types

Lenders and developers may simply avoid doing business with companies or properties that have an environmental risk. Development experts have noted that a growing segment of the economy is potentially vulnerable to this type of lender reticence—which in some areas takes the form of environmental redlining, or refusing to lend for fear that the property presents more than conventional economic risk. Some have dubbed this new term *brownlining*. Many bankers, in fact, have identified categories of undesirable borrowers, including tool and die shops, bottling and canning plants, high-technology metal fabricators, semiconductor facilities, and utilities. Ironically, local governments and economic development organizations have targeted many of these same industries for special incentives, because they are viewed as key to community economic growth and diversification. In many areas, this trend precludes lending for the renovation or reuse of older industrial sites, as well as for modernization of many manufacturing operations. The social implications of such brownlining are clear: Inner-city residents, particularly minorities and those with low incomes, suffer the economic and environmental consequences of disinvestment in their communities.

As ABA points out, lenders simply will not finance cleanup efforts or invest in companies that specialize in site remediation unless they receive clarification of the secured creditor exception. In some cases, the size and financial resources of the seller influence a site's marketability and reuse potential. For example, an old industrial property might interest prospective purchasers only if the owner is a thriving corporation that can afford any necessary site cleanup. Thus, if EPA were to sue for cleanup, the new owner might successfully pursue the seller to recover remediation costs, or EPA might hold the seller liable.

Lenders also wish to avoid defaults or the risk that mortgagees will not be able to repay the loan because they have been forced to bear responsibility for an expensive cleanup. Consequently, lenders may limit their loan activity to large companies with considerable assets. Small enterprises, especially those engaged in startup or expansion, usually use the land and buildings being financed as loan collateral, because they have no other assets to offer. If the land or buildings are of questionable value or might contain environmental hazards, the loan may not be made. The high failure rate of small businesses in general makes this type of lending especially risky, and the collateral specified in the loan agreement becomes even more important.

Inability to secure loans may stifle many budding enterprises whose owners must consider older buildings in less desirable locations because they cannot afford new facilities in town or in the suburbs. Furthermore, small businesses often need assistance in the financial management area, particularly in the early stages of a new enterprise. In the past, lenders often worked with and counseled their borrowers. But some bankers have significantly scaled back such relationships since the *Fleet Factors* decision, with its implications for lender liability, clouded this practice. The liability issue exacerbates other

problems that many small businesses face in trying to secure credit. Without access to capital, these companies cannot maintain their competitiveness, expand to take advantage of new market opportunities, update their equipment and facilities, maintain necessary inventories, or create new jobs. Moreover, as might be expected, they have great difficulty obtaining the money needed to fund site cleanup.

Increasing Transaction Costs

As previously noted, CERCLA gives prospective owners an incentive to evaluate sites before purchasing them. Influenced by the *Fleet Factors* decision, lenders increasingly require extensive environmental testing and cleanup, not only to protect themselves from liability but also to ensure the value of the collateral. Some States have adopted their own environmental assessment requirements, but these are time-consuming and expensive, significantly boosting project transaction costs. Some test bores, for example, cost $15,000 or more, and a complete assessment of a long-time industrial site that is detailed enough to satisfy a prospective lender may exceed $50,000. In many cases, the cost of the environmental investigation and the time required to carry it out alter the balance sheet of a proposed project, undermining its financial viability.

Concerns about contamination have unleashed a flood of related paperwork. One official of a leading Chicago bank has noted that loan officers now must review entire sections of loan documents devoted solely to environmental considerations, increasing the time and cost of assembling and processing a loan package as much as threefold. Small businesses are particularly hard hit by these up-front investigative fees, which make small loans prohibitively expensive. Many prospective owners will be deterred from purchasing property if they must spend more money to find out whether it is contaminated.

Testifying before the Senate Committee on Environment and Public Works in April 1991, an ABA representative explained how liability issues can add to the cost of small business borrowing. The official described a typical borrower in a business viewed as a high risk for contamination—a dry cleaning establishment. If the owner wants to borrow $50,000 to improve or expand the facility, a typical amount for such a loan, the collateral almost certainly would be the business itself. The bank would require a basic environmental assessment that would probably cost between $500 and $2,500, a significant expense (1 to 5 percent) for a loan of that size. Even if the assessment revealed no contamination, banks would be nervous about making such a loan, because assessments are not foolproof and offer no guarantee to the lender. If contamination were to surface later, the lender could find itself holding worthless collateral. If the bank were to foreclose, it could face cleanup costs that exceeded the value of the collateral. As the ABA spokesperson suggested, many lenders are unwilling to risk significant cleanup costs in order to make small business loans with marginal profits of about $1,000 a year. Other lenders may require a detailed second assessment that could cost significantly more than the initial examination. For many small companies the cost would be prohibitive, and the project would be stalled. If cleanup were needed, the transaction would be further disrupted, because even a low-cost cleanup can take months to complete and complex efforts may take years. Old industrial sites present special cleanup challenges, since there may be few records available on past uses of the site.

Although environmental assessments undoubtedly increase the transaction costs for industrial facilities and can undermine the economic viability of some reuse efforts, such steps are precisely the desired result of the CERCLA liability provisions. By forcing responsibility for cleanup on owners and lenders, these provisions are achieving the goal of fostering privately funded cleanups and conserving public funds.

Restricting and Complicating Involvement With Borrowers

Even experienced finance companies are influenced by the specter of liability, which affects the way they carry out their operations. Real estate lenders manage their portfolios in a variety of ways. Some specialize in originating and holding loans. Others originate loans and then place them with investors in the secondary market. Some mortgage bankers match real estate projects to investors rather than closing loans in their own names. Others act on behalf of insurance companies, pension funds, and other institutional buyers. Some lenders also take participatory interests in real estate, especially commercial projects, and are considered to be both an owner and a lender. The possibility of site contamination and potential CERCLA liability can affect each type of transaction. This new reality is changing the way large real estate lenders do business. For example, real estate financiers increasingly demand indemnification from sellers for any preexisting contamination. Such agreements have been useful in allocating responsibility and cleanup costs and therefore are helpful in closing deals. These agreements address such issues as:

- Detailing cleanup expenses, fines, third-party claims, and loss of profits.
- Determining reasonable costs.
- Defining "how clean is clean enough" for purposes of allocating costs.
- Outlining the consequences befalling a party that fails to adhere to the agreement.
- Specifying the duration of the indemnity and steps to be taken if one of the participants is sold or involved in a merger.
- Specifying which party bears the burden of proof in the process of determining the time at which contamination took place.
- Defining limits on potential liability and cleanup costs.

Such agreements are not for everyone. First, the negotiations are lengthy, involve a number of technicians and lawyers, and thus are expensive to conclude. Therefore, indemnification agreements generally are not possible for small business operators. Second, even the best-crafted agreements are ultimately meaningless if a key participating company becomes bankrupt. Finally, agreements cannot be undertaken on many old industrial sites whose titles are held by the corporate remnants of defunct manufacturing companies.

Although lenders have begun to limit their oversight of borrowers in order to avoid the prospect of environmental liability, this restraint occurs at a time when prudence would indicate the need for greater scrutiny of the borrower's creditworthiness. However, as the following case studies suggest, some developers have expedited the cleanup process by working closely with the appropriate environmental agencies or by soliciting the help of the Governor's office.

Case Studies: Site-Specific and Citywide Strategies

The following site-specific case studies illustrate innovative site reuse projects in four communities—Minneapolis, Minnesota; New Haven, Connecticut; Commerce, California; and Ambridge, Pennsylvania. Although the problems and remedies involve unique community circumstances, they have been successful despite all odds and thus have broader application. Innovative public-private partnerships, cooperation between local governments and State regulatory agencies, and marketing ingenuity have enabled dedicated parties to carry out successful redevelopment activities. This section also presents

site reuse strategies developed by the first jurisdictions selected to participate in EPA's brownfields pilot program—Cleveland, Ohio; Bridgeport, Connecticut; and Richmond, Virginia.

Minneapolis, Minnesota—Pure Oil Company and Gas Farm Project

Minneapolis is one of the few cities in the Nation to establish a policy to redevelop contaminated industrial sites within its boundaries. It purchases these properties through the Minneapolis Light Industry Land Acquisition Program, accepting some liability for the cost of environmental cleanup. The city council sets aside $5 million a year from a tax-increment financing (TIF) plan to buy contaminated sites and provides up to $6 million in low-interest loans to developers selected to undertake appropriate projects. The properties subsequently are sold or leased, depending on their environmental status or location.

The Minneapolis Community Development Agency (MCDA) coordinates all redevelopment efforts in the city, including abandoned sites, riverfront projects, and substandard housing. The agency has pursued the reuse of old industrial properties aggressively since the late 1970s. By the early 1980s, Minneapolis had established a tax-increment financing project called *Industry Square* to fund the return of light industry to unused industrial properties. In 1984 MCDA purchased a 5-acre parcel in that district, the former Pure Oil Company site, from IDS-American Express. City officials had learned that a motel chain was considering the property and decided to buy it to promote manufacturing.

MCDA officials were familiar with the site's past industrial use and aware of potential environmental problems from a preliminary study conducted for the motel chain. However, the city did not conduct a thorough environmental audit before making the purchase. In the early 1980s, such an audit was not common practice. Later, part of the site was designated as a Minnesota High-Technology Corridor, which placed extensive restrictions on land use and made construction of a motel on the site impossible.

In 1986 MCDA hired a firm to conduct a phase I environmental assessment of the site. According to the audit, the Pure Oil Company had operated an oil and gas tank farm on part of the site from 1912 through the early 1960s. On the land bought by the city, Pure Oil had placed two 1-million-gallon, above-ground fuel storage tanks and several 10,000- and 20,000-gallon tanks. Union Oil of California (UNOCAL) bought the site from Pure Oil in the 1960s, and IDS-American Express bought out UNOCAL several years later. The various owners had removed the tanks, leaving extensive underground piping in place. The environmental audit revealed far-reaching petroleum-related soil and groundwater contamination that threatened redevelopment plans for either high-technology or industrial uses.

Minneapolis decided to proceed with redevelopment of the property in 1987 and to pursue UNOCAL for cleanup costs later. The city spent almost $1 million to remove contaminated soil and install a vapor barrier to contain fumes that were evaporating from the groundwater. Funds for the project came from the original TIF plan. However, the source of contaminates leaching into the groundwater was located on an adjacent site, and the Minnesota Pollution Control Agency issued a commissioner's order to UNOCAL to remediate the groundwater contamination. The company installed a test well and began investigating installation of a pump-and-treat system. Meanwhile, the city reached a settlement with UNOCAL to recover public expenditures at the site.

With the cleanup in progress, MCDA authorized a construction-equipment manufacturer, FMC, to undertake development of the high-technology parcel. Fearing involvement in the liability chain, FMC leased the land from the city rather than purchasing it. The city,

therefore, retains title to the property. FMC constructed a research and development facility on the site, which has since closed. The facility is currently leased to the computer division of the University of Minnesota.

Larry Heinz of MCDA noted that remedial work at the Pure Oil site progressed fairly smoothly and quickly because MCDA played an active role, pushing the Minnesota Pollution Control Agency to monitor the cleanup. Heinz felt that because the State has a relatively small population, few bureaucratic barriers hampered the project. The Pure Oil site cleanup occurred before State resources were strained by the high volume of cases that State agencies have had to address in the 1990s. In this case, assignment of responsibility was reasonably straightforward. The groundwater monitoring could be pursued in stage 2 of the cleanup, allowing the redevelopment to proceed as planned.

In 1988 Minnesota established another type of TIF program, known as hazardous waste subdistricting. Recognizing the impact of contamination, the program sets the land value very low, sometimes to zero. This allows more revenue to be raised because of the greater difference between the base and the new increment. Cleanups must be approved by the Pollution Control Agency before TIF funds can be used. Minneapolis also rehabilitated the old Sioux Line rail yard using the TIF mechanism. The city already has spent more than $500,000 for the testing required for Pollution Control Agency approval.

New Haven, Connecticut—U.S. Repeating Arms Complex

From one small factory built in the early 19th century, the Winchester Repeating Arms Company grew along with the country's westward expansion. Winchester and other Connecticut arms makers dominated the manufacture and sale of rifles, sidearms, and ammunition through the mid-20th century. At the height of its operations, Winchester occupied 25 buildings on 80 acres in north-central New Haven near Yale University. In 1931 Winchester sold its holdings to the Olin Corporation, a manufacturer of brass fittings and other metal products. Olin later merged with a chemical manufacturer and located its chemical and nuclear research divisions in several buildings on the site. Almost 20,000 people worked in the various operations of Olin and Winchester until the late 1950s. During the next few years, Olin shut down some sections of the New Haven plant and built modern facilities elsewhere. By the mid-1970s many of the buildings were empty. All of the New England States experienced a similar pattern of decline in the 1970s and 1980s, when heavy manufacturing industries moved south or west, leaving deteriorated and often contaminated land and buildings in the region's central cities. With the plants closing, surrounding neighborhoods began to decline as well. The Winchester-Olin complex was but one of many venerable industrial sites in older cities caught in transition.

In the late 1970s Olin president John Henske, a Yale-educated chemist, decided to take action to resolve some of the problems created by Winchester's decline. He saw possibilities for the development of high-technology businesses in the area and interested New Haven Mayor Biagio DiLieto and Yale University President A. Bartlett Giamatti in a joint effort. With help from the State, the parties formed the nonprofit Science Park Development Corporation (SPDC) in 1981 to develop a high-technology, light industrial center. Yale's strong research programs and facilities made the area attractive to entrepreneurs and firms seeking market innovations. According to Sal Brancati of the New Haven business development office, the city and State economic development agencies were eager to promote the sort of initiative that would revive the Winchester site, put people back to work, and restore the neighborhoods. At the same time, Olin wanted to dispose of its unused acreage and buildings.

Olin donated most of its unused land to Science Park, although the company continues to own and operate one building in the complex, which contains a metals research laboratory and a chemical research and development operation. Yale, another major backer, loaned SPDC $1.8 million and donated $500,000 to rehabilitate building space. The city contributed $800,000 over 8 years for operating expenses and $950,000 toward rehabilitation costs. The State's Department of Economic Development has spent more than $4.5 million for building renovations, infrastructure improvements, and administrative and marketing expenses. A consortium of 10 New Haven banks, joined by Olin and Yale, loaned the corporation funds to cover capital improvements and operating deficits until its high-technology incubator program becomes self-sufficient.

Most of the buildings in the Winchester-Olin complex were eligible for listing in the National Register of Historic Places on the basis of their role in U.S. firearms and ammunition research and production. A mix of 19th- and 20th-century brick and concrete structures, they once housed the original brass rolling mill, assembly buildings, foundries, warehouses, a power house, and firing ranges. Working with the Connecticut Historical Commission, SPDC conducted a survey of the buildings in 1987 as required by State and Federal laws addressing changes to historic properties. The functions and appearance of the complex were documented extensively and photographed.

Outmoded and empty Olin buildings cover about 15 acres within Science Park. With funds from the State and the Economic Development Administration (EDA) of the U.S. Department of Commerce, SPDC renovated two buildings in 1985 to establish a small-business development center. Both were World War I-era buildings constructed of reinforced concrete, with more than 250,000 square feet of space, of which 175,000 is occupied. The center quickly became one of the largest high-technology business incubators in the country, with more than 100 companies, ranging from single entrepreneurs to corporate giants. Olin and Yale rent space in the incubator. In the early 1980s, a group of Olin employees bought the Winchester rifle operation, renaming it the U.S. Repeating Arms Corporation. Its complex includes 1 million square feet in several of the old manufacturing buildings on the southeast portion of the site, about one-third of which are in use.

When redevelopment plans began to gather momentum, SPDC partners were forced to deal with enormous obstacles. The site was filled with run-down buildings, saddled with environmental problems, and surrounded by residential neighborhoods. After so many years of use for various industrial purposes, the buildings and surrounding grounds needed extensive remedial work. Many of the unrenovated buildings had been abandoned, and some posed health or safety problems. All were considered for reuse, but obsolescence and market conditions made adaptation of many impossible. Five buildings near the edge of the park facing a residential neighborhood have been demolished to make room for additional development. Many of the structures were heavily reinforced to withstand an accidental explosion, making demolition difficult.

Early in the redevelopment process, Olin conducted an environmental inspection that revealed the presence of asbestos insulation in the buildings and a large amount of lead from ammunition manufacture and testing. Several firing ranges contained large quantities of lead-filled sand. Machinery and machine pits contained various pollutants, and PCBs and coal wastes remained at the power plant. SPDC hired environmental consultant HRP Associates to drain and remove the underground storage tanks. Soil samples from the tank areas were analyzed to determine whether contaminants had leaked through to the groundwater. Sampling of groundwater at the site began in 1989. Soil samples revealed several types of contaminants—petroleum, solvents, and polyaromatic

hydrocarbons (PAHs). The consultants will continue to sample the groundwater every quarter and report the results to the Connecticut Department of Environmental Protection (DEP). Plans for inspection, cleanup, and monitoring of the site are subject to the approval of DEP. Connecticut law has no provisions to halt proceedings, but remedial investigations and subsequent actions must continue on a schedule established and monitored by DEP.

One of SPDC's primary goals is to provide jobs for residents of the nearby Newhallville and Dixwell neighborhoods, many of whom worked for Winchester and Olin in better days. These neighborhoods are beset with typical inner-city problems, and SPDC is committed to seeking business tenants that will provide jobs and training for minority and low- and moderate-income residents. In 1990, SPDC received more than $800,000 from the Family Support Administration of the U.S. Department of Health and Human Services to help growing companies create more jobs for this target population. When Science Park is self-supporting, SPDC plans to spend some of its funds for innovative small business development and for job training and placement. The challenge of meeting this goal is formidable.

Like many innovative ventures, Science Park has had its problems. Business incubators have difficulty surviving because their tenants—new, small businesses—fail at a high rate. Targeting a particular type of business also can hurt an incubator's chances of success. Limiting occupants to high-technology businesses, for example, reduces the number of eligible firms. Publicly supported incubators often plan to hire and train members of special groups, such as inner-city residents, minorities, or dislocated workers. While worthy in terms of public policy, this goal increases the cost of the venture. Science Park has undergone financial restructuring and recapitalization, because servicing a $10-million debt had become too difficult for an operation of its size. According to former SPDC president William Ginsberg, Science Park persuaded the financing consortium to reduce the interest rate on its loan from 9 percent to a blended rate of less than 3 percent.

In 1991 Science Park broke even for the first time. SPDC arranged an $8 million capital package to support future activities and applied to EDA for another $1 million in grants. It received commitments from the State for $5.5 million and from the city for $625,000 in new investment. Yale and Olin agreed to a loan of $750,000 in new debt, offering to forgo future interest payments in the hope of receiving a return as investors if profits are generated. The city and State have agreed to the same terms. All participants in SPDC are determined to make the project a success. The State intends to create an advanced technology center in the park in cooperation with Yale and has pledged $10 million over 5 years to support research and development in neuroscience applications. Yale is committed to raising a similar amount from industry.

According to Ed Parker, director of DEP's Site Remediation Branch, the agency has targeted New Haven, as well as other older manufacturing cities, for expedited review of cleanup plans. DEP has played an active role in the identification of sites where redevelopment possibilities exist, including Science Park. Several additional changes are planned. U.S. Repeating Arms Complex plans to build an addition on land that Olin plans to donate to Science Park for this purpose, with the lease payments going to Science Park. This project will retain 500 jobs and create 200 to 300 new ones. An abandoned railroad line that cuts through the site runs past the Yale campus to downtown New Haven. When SPDC's economic conditions are favorable, the railroad right of way may become a road serving the site and the neighborhood.

Commerce, California—Uniroyal Tire Factory

The city of Commerce, 6 miles southeast of downtown Los Angeles, has a mixture of industrial, warehouse, and distribution facilities as well as newer office buildings, research and development operations, and business parks. A major employer, the Uniroyal Tire Company, closed a 35-acre factory complex there in 1978, and the site remained vacant until the Commerce Redevelopment Agency bought it in 1984 for $14 million, intending to make it a showpiece of community redevelopment. An important part of salvaging the site was saving the Uniroyal building's perimeter wall, a historic facade visible to thousands of daily travelers on the Santa Ana Freeway. It also meant finding a suitable new use for the property, removing or treating industrial contaminants, and improving the infrastructure.

The factory, constructed in 1929–30 by the noted Los Angeles firm of Morgan, Walls and Clements, had a remarkable design that made it a landmark overnight. Wanting to convey a sense of strength, the original owners, the Sampson Tire & Rubber Company, had commissioned as its administration building an Assyrian-style palace that might have come straight from a Biblical story. The cast-concrete walls are incised with two-story figures of Babylonian warriors and winged mythological animals. Square fluted columns support a pyramid of crenelated terraces over the building's central section. The 1,700-foot perimeter wall, decorated with more Babylonian figures, shields the site from the street and gives the complex the look of a movie set.

In 1986 the redevelopment agency began searching for a developer able to find a new use for the site that would replace lost jobs and save as many of the historic structures as possible. Two years later the Trammell Crow Company was selected to develop the site as a mix of retail and other commercial uses. The plan called for a factory outlet mall, offices, and a hotel at Uniroyal, which was renamed the Citadel. Trammell Crow's proposal was favored because it retained most of the historic features, including rehabilitation of the Assyrian palace to meet existing earthquake and seismic standards and incorporation of parts of the old manufacturing buildings into the new design. "The idea was to create a stylish urban, not suburban, signature," said Keith Kennon of Trammell Crow, which agreed to a 65- to 99-year lease on the property. (City of Commerce, 1989.) All of the buildings and improvements are to revert to the redevelopment agency upon expiration of the lease. The city agreed to lend Trammell Crow the proceeds of repayment of an Urban Development Action Grant (UDAG) loan from an earlier redevelopment effort, which the company could use for rehabilitation work, construction, and gap financing. Principal and interest payments were deferred for 3 years. Over a 20–year period, the project will receive loans of more than $18 million.

As required by the California Environmental Quality Act, the city prepared an environmental impact report (EIR) on the project that analyzed 13 areas of potential environmental effects, including soil, water, air quality, noise, risk of upsetting the population, housing, transportation, public services, utilities, public health, cultural resources, and parking. When the review began in 1987, the city found significant adverse effects on air quality and cultural resources and recommended measures to lessen them. Although the architects planned to restore and reuse the historic wall, they proposed the removal of a 120-foot section in order to create a formal entrance and open the interior of the complex to public access. This modification was deemed necessary for attracting customers to the new businesses and was also the least destructive of the proposals considered. The effect of more auto exhaust on air quality was judged to be unavoidable for a redevelopment project and outweighed by the benefits to the community.

The redevelopment agency engaged an environmental consulting company, Applied Geosciences, to conduct a formal site investigation, also required by CEQA, that included searching records, examining old photographs, and interviewing former employees to determine whether potentially toxic chemical and building materials had been used at Uniroyal. From the information assembled, the agency determined that toxic substances were present in the soil and the buildings. An intensive cleanup would be needed before the site could be reoccupied. Trammell Crow's plans for the Citadel called for opening the retail court in November 1990. The biggest challenge, according to Ricardo Gonzales, director of public works and manager of the cleanup, was to convince State regulatory agencies to allow site preparation to proceed while the cleanup was still underway. Applied Geosciences had to work on an accelerated schedule to locate and remove any materials identified as contaminated.

The most serious environmental problem involved two plumes of soil polluted by leaks from underground storage tanks. Over the years, diesel fuel and solvents containing hydrocarbons had seeped through cracks in the tanks into surrounding soil. Although the effect on the groundwater was unknown, the redevelopment agency began to remove the tanks in 1988 and to study ways to clean up the contamination, under the terms of a memorandum of understanding with Trammell Crow. Essentially, the city accepted responsibility for cleaning up contamination inherited from past uses and from migration of pollutants onto the site from adjacent properties. Other potentially toxic substances included napathane in storage tanks, lead in process wastes, organic solvents in railroad car unloading areas, PCBs in electrical equipment, and trichloroethane in outdoor pits. Inside the buildings, asbestos was found in the insulation. Industrial processes had produced oil-based byproducts that collected in concrete sumps. Over the years, the wastes had leaked through cracks in the floor slabs, leaving several sludgy waste pockets under two buildings.

Two Los Angeles County regulatory agencies took the lead in supervising various aspects of the cleanup, relieving some of the State agencies' regulating burden. The Department of Health Services supervised the removal of asbestos, PCBs, and other surface contaminants, while the Department of Public Works (DPW) oversaw removal of the tanks and remedial treatment of the two plumes of soil. Gonzales and his team removed hundreds of barrels of contaminated soil, ash, asbestos, and PCBs under a plan approved by the health department. They excavated and removed the building slabs, accumulated wastes, and a sealed tank with a capacity of 1.25 million gallons containing about 4 feet of sludgy liquids, petroleum wastes, and water. This phase of the cleanup was completed in late 1989.

DPW approved a vapor-extraction process to treat the two underground plumes and issued the necessary grading permits so that site work and cleanup could occur at the same time. The larger plume contained solvents and other volatile chemicals, probably degraded from gasoline; the smaller plume contained diesel fuel. Applied Geosciences built 14 wells in the larger plume and 2 in the smaller one. Gonzales arranged for a portable extraction system that moved from one area to another with the site crews. Pipes from the wells ran along the ground to a processing plant with an electric oven; a pump conducted the fumes to the oven, where they were burned off. Several other regulatory agencies, including the Air Quality Management District and the Water Quality Control Board, had some jurisdiction over the cleanup effort. Water quality regulations required the installation of four wells to test and monitor the condition of the groundwater. Samples taken in 1989 showed no contamination, but the wells will stay in place for the foreseeable future to be sure that contaminants from the plume are not reaching the water table.

With the cleanup underway, the redevelopment agency applied to EDA for a grant, as part of the EIR mitigation measures, to widen and upgrade roads around the site, improve traffic flow, and allow access to more vehicles. In 1991 EDA approved a grant of $900,000 to assist the Citadel project and promote future development of vacant and underused industrial properties in the area. By the end of 1989, preparatory work had been completed and the old tire factory had been dismantled. The following year, construction began on the new stores, the hotel, and four office buildings. The architects bisected the site with a broad avenue, lined with 250 palm trees in round, tire-like bases, that leads from the opening in the Assyrian wall to the new buildings, retail on one side and a hotel on the other.

The retail component, built in the shell of the Uniroyal factory, houses outlet stores in a series of courts and arcades. According to environmental designer Deborah Sussman, the plan was intended to "create a feeling of being in a street rather than a shopping mall, and to preserve the industrial skeleton of the old factory and flesh it out with fresh colors and imagery." (Whiteson, 1991) The old factory's shed roof and trusses were strengthened and incorporated into the roof of the new food court. Most of the stores in the 157,000 square feet of space offer discount clothing and footwear. Leon Whiteson, an architecture critic for the *Los Angeles Times*, praised the architects' and designers' fusion of old and new building elements and the use of vivid accent colors. "Free-standing pavilions in steel and glass sport purple columns, and pillars supporting the arcades are acid green," he wrote. "Attractive blue and yellow walls lining long colonnades are linked to the parking lot by high steel galleries painted yellow ocher and rust red." He considered the restoration of the Art Deco lobby of the administration building, with its Assyrian friezes and stylized papyrus bas-reliefs, to be especially effective. (Ibid.) The building now has retail stores on the ground floor and offices above.

The Commerce Redevelopment Agency has spent more than $23 million on the Citadel project, including about $3 million for investigation and remediation of the contaminated soil and for direct and administrative costs; continued monitoring of the groundwater will add costs in coming years. The city filed suit in Federal and State courts in 1988 to recover some of the cleanup costs from the former owners. The Federal suit was filed under CERCLA, while other causes of action were used for the State suit. Both suits were settled out of court for undisclosed sums in 1991.

The Citadel is expected to generate about $592 million in lease income for the city over the first 65 years, in addition to $7.7 million in property taxes that the redevelopment agency intends to use for other development activities. The retail stores collect $250,000 to $350,000 in sales taxes annually. When all components in the complex are operating, about 2,000 people will be working in various capacities. A fifth office building is planned for the site as part of the second phase of development. Under the terms of the ground lease, construction of the 120,000 square-foot, six-story structure must begin in 1997. The agency and the developer are also negotiating an addition of 85,000 square feet of factory outlet space to capitalize on the Citadel's success.

Ambridge, Pennsylvania—WorldClass Steel, Inc.

Those who remember the glory days of steelmaking in western Pennsylvania during World War II boast that the steel works in the Monongahela Valley outproduced those of Germany and Japan combined. Steel used to build such national treasures as the Empire State Building, the San Francisco-Oakland Bay Bridge, and the Golden Gate Bridge came from mills in the "Mon Valley." Those days are long gone. The global recession sparked by the energy crisis of the 1970s precipitated a long, steady decline for most of the "Big

Steel" companies in western Pennsylvania, many of which, according to industry accounts, had created too much capacity and had become inefficient producers.

For example, 30,000 steelworkers in Beaver County, northwest of Pittsburgh, lost their jobs during the 1980s. The American Bridge Division of the U.S. Steel Group, whose 8,000 workers cut, welded, and painted the beams for the Oakland Bay Bridge, shipped its last product in 1982. Today, hundreds of acres of abandoned mill sites dot the land where the Ohio, Monongahela, and Allegheny Rivers merge—rivers that once were thoroughfares for barges carrying finished steel products from the mills and returning with raw materials such as limestone, coal, and iron ore. It was not until 1991 that this area, blessed with river, rail, and interstate highway access, began to see renewed economic activity. However, lead, PCBs, oils, asbestos, and slag—the residual from steelmaking operations—contaminate much of the land at these former mill sites. The combination of poor waste-handling practices and dirt floors in many of the buildings has raised fears of severe groundwater and soil contamination throughout the area.

In 1987 WorldClass Steel, Inc., began searching for a site on which to build a modern mini-mill. Company president Matthew Botsford initially sought land closer to Pittsburgh but—for environmental, structural, and logistical reasons—decided on the Ambridge site, which had been part of the U.S. Steel Group complex. The site's primary advantage, from an environmental standpoint, was that steel had not been manufactured there; it had merely been fabricated into a finished product. According to WorldClass, the worst remediation problem in preparing the site entailed removing about 18 inches of lead-contaminated soil, the result of years of painting the steel beams indoors on dirt floors. Other contaminants that were removed included asbestos-lined pipes and PCBs in various electrical transformers. No oily wastes or heavy-metal-laden slags were found at this tract. Private environmental engineers hired by USX Realty Company, a division of the U.S. Steel Group, took bore samples, removed soil, and completed the cleanup before WorldClass took ownership of 16.5 acres of the site in 1991 and began its steel pickling (finishing) operations. U.S. Steel also tore down many old buildings that would not be needed by WorldClass. Officials of the Pennsylvania Department of Environmental Regulation have retained the right to do spot checks and take soil and groundwater samples at the site periodically.

In August 1994, WorldClass announced plans for a $375 million expansion, slated to produce 450 new jobs and 1 million tons of steel annually by the end of 1996. To complete the expansion the company planned to clean up and develop the rest of the 75–80 acres at the Ambridge site, constructing Pennsylvania's first flat-rolled mini-mill that would produce high-quality finished steel for the profitable automobile, consumer electronics, and housing markets. The WorldClass plan involved using about 10 percent iron pellets and about 90 percent scrap, for which it sought to establish a long-term supply contract for about 125,000 tons of scrap steel monthly with a Chicago-based company.

Public and private sector investment in the plan were hailed as critical components to its success at the time. The Commonwealth of Pennsylvania offered to finance between 10 and 15 percent of the entire package at an interest rate of about 4 percent. Duquesne Power Company agreed to supply WorldClass with cheap electricity to help fire the 5,000 degree furnaces. Such investments by local entities, analysts say, are key to triggering additional investments in the industry. (*Business Week*, 1994.)

In the fall of 1995, however, the WorldClass Board of Directors voted to remove founder and president Matthew Botsford and his partner and chief financial officer Ed Neese and abandon plans to build the mini-mill. AT&T, the company's main lender, had advised the

EPA Brownfield Pilot Projects

Atlanta, Georgia. Build brownfield site database, establish aggressive public communication strategy, conduct audits, and create central oversight process in order to monitor technical elements of site remediation.

Baltimore, Maryland. Promote new cleanup technologies, coordinate Empowerment Zone and brownfield pilot activities, and develop innovative financing mechanisms for assessment and remediation.

Birmingham, Alabama. Link environmental protection approaches involving flood control and stormwater/groundwater contamination reduction with remediation of soil and site-specific contamination, and develop consortium of community leaders to direct resources to targeted areas.

Burlington, Vermont. Engage affected neighborhoods, actively recruit businesses to targeted sites, and focus on agricultural sites.

Camden, New Jersey. Improve city's economic health through cleanup of brownfields, which constitute more than half of all industrial sites in city.

Cape Charles, Virginia. Target assessment and cleanup plans specifically to requirements of municipal dump.

Chicopee, Massachusetts. Develop education program for neighborhood near a brownfield, identify funding sources, and document redevelopment process for replication at other brownfield sites.

Chippewa County, Kinross Township, Michigan. Convene community task force, including Sault Ste. Marie Tribe of Chippewa Indians, and plan redevelopment strategies for individual brownfields.

Clearwater, Florida. Work with University of South Florida to design and propose "flow of ownership" plan to help encourage investment, create jobs, and ensure environmental justice at targeted brownfield site.

Detroit, Michigan. Explore barriers to reuse and identify the way they differ among residential, commercial, and industrial sites.

East St. Louis, Illinois. Target 220-acre former aluminum plant as site for new secondary materials manufacturing district.

Indianapolis, Indiana. Hire brownfield coordinator who will oversee site inventory and development of GIS-based information system; coordinate with potential purchasers and city officials on specific transactions; and review funding, liability and other issues for city.

Kansas City, Kansas and Missouri. Conduct bistate initiative focussing on central industrial district; address community involvement, site inventory, and assessments; and develop public-private partnerships.

Knoxville, Tennessee. Explore private-party acquisition of properties and work with lenders to establish low-interest loans to environmentally friendly companies.

Laredo, Texas. Seek conversion of brownfield into waterfront recreation area near campus of a community college.

Lima, Ohio. Focus on remediating and redeveloping 200-acre industrial park and support ongoing river corridor redevelopment activities in order to enhance water quality and provide greenspace.

Louisville, Kentucky. Use GIS technology to inventory sites, explore idea of temporary municipal acquisition of sites to spur development, and conduct areawide assessment of aquifer.

Miami, Florida. Work with city's Neighborhood Enhancement Teams to encourage community involvement and private local investment in sites affected by contamination from leaking underground storage tanks, sewers, and industrial chemicals.

Mill Sites, Oregon. Test use of generic cleanup levels and create a computer model to predict costs and benefits of redevelopment and cleanup.

The Navajo Nation. Assess contamination and remediation options at closed timber mill site.

New Orleans, Louisiana. Focus on community outreach to city's predominantly African-American population and establish consortium of community representatives, city officials, bankers, and others to identify funding sources for brownfield redevelopment.

Newark, New Jersey. Work with area academic institutions to apply innovative technologies at identified sites and complete GIS-based brownfield inventory. Continue outreach to affected communities and encourage private-sector investment.

Prichard, Alabama. Remediate extensive organic chemical contamination of city's water supply by using State Enterprise Zone tax credits to encourage investment.

Provo, Utah. Remediate and redevelop large former steel mill property consistent with meeting environmental justice and sustainable development objectives.

Richmond, California. Target brownfield sites along 900-acre North Richmond Shoreline and identify redevelopment proposals that favor public recreation there. Impose zoning standards, when necessary, to implement plan.

Rochester, New York. Use neighborhood sector planning teams and explore brownfield revolving loan fund for developers and property owners.

Rome, New York. Use innovative technologies developed by Department of Defense to remediate contamination on 17-acre parcel. Clean and redevelop parcel as demonstration project to illustrate community involvement, letters of intent, and site assessment approaches.

Sacramento, California. Ensure that local land-use objectives are met in brownfield redevelopments; and develop automated land-use permitting process that overlays environmental information onto land-use maps.

St. Louis, Missouri. Establish revolving loan fund for properties with negative value and prepare brownfield redevelopment handbook to ensure replicability of lessons learned.

San Francisco, California. Propose redevelopment model for South Bayshore community based on military base closure lessons, including environmental justice, land use, zoning, and economic development. Adapt air quality regulatory approach when developing risk-management plan.

Shreveport, Louisiana. Use designation of city's urban core neighborhoods as part of National Performance Review program to judge efficacy of Federal aid to troubled neighborhoods in order to develop strategy for increasing economic and environmental health. Focus on community education and involvement, site assessments, and capacity-building in developing long-term strategies.

Trenton, New Jersey. Focus on cleaning and reselling one marketable site to initiative revolving loan fund that can be used for future sites; create market analysis that can help match sites with future owners, and form "eco-industrial park" advisory group.

West Central Municipal Conference, Illinois. Establish Brownfield Prevention Program to identify and prevent industrial practices that could lead to future brownfields.

board that too much time and effort was being spent on the venture, possibly at the expense of ongoing operations.

Environmental contamination was not a factor in the board's decision to abandon expansion plans. At the time of the initial announcement, WorldClass was preparing to prove that contamination was under control and capable of being cleaned up; the State, moreover, required WorldClass to prepare an environmental impact statement (EIS) evaluating the likely impacts of its operations on the health of the river ecosystem. Botsford noted that the banks were not sympathetic to the company's intent to purchase state-of-the-art pollution prevention and control equipment as part of its loan package, in order to protect the rivers from electric furnace dust and sulfur dioxide and nitrogen oxide emissions.

When WorldClass announced the expansion, Botsford felt the future was bright for the mini-mill concept in Pennsylvania, potentially topping out at a 2-million-ton capacity if the economy remained healthy. Nevertheless, he acknowledged the role that environmental contamination played in frightening lenders and developers away from brownfield sites, and stressed the importance of the Federal Government, responsible and helpful local development corporations, and State officials becoming "partners" with industry as it undergoes revitalization efforts.

EPA Brownfield Pilot Sites

Early in 1994 EPA launched its Brownfield Economic Redevelopment Initiative, proposing a number of administrative reforms to the Superfund program and announcing a pilot program to give grants to communities working to remediate and redevelop brownfields.

As of Fall 1996, EPA had awarded brownfield pilot grants to 60 communities. Applications from the recipients show a creative mix of proposed activities. Highlights from some of the project summaries are listed in the box on pages 50–51.

Public-Sector Financial Incentives To Promote Brownfield Reuse

The complicated technical and administrative processes and legal hurdles of acquiring, cleaning, and reusing older industrial sites can be expensive and time-consuming. Site evaluation processes, testing, potential legal liabilities, and other factors may deter private participation in activities that can bring old industrial sites back to productive use. In many situations, the private development and financial sectors are not able or willing to act on their own to ensure that the full economic potential of site reuse will be achieved.

Critical funding gaps are the primary deterrent to site and facility reuse, especially for small, start-up businesses. Such businesses often find conventional sources of capital to be nearly out of reach. When environmental concerns are present, securing a loan may be impossible. Clearly, the public sector can play a role in advancing cleanup and reuse activities in a way that brings economic, social, and esthetic benefits to the supporting community. Moreover, these efforts need not be giveaways. The notion of the entrepreneurial city or State, increasingly prevalent in many types of development programs, can be extended to site cleanup and reuse initiatives. Public agencies and organizations that share in project risks also can share in the rewards. For example, States and localities may assume some of the responsibilities for site preparation and cleanup, recovering some of their costs during subsequent sale or development of the site.

Government at all levels is finding creative ways to help businesses overcome the difficulties that contamination brings to the site reuse process by setting up finance programs to ease the cost or terms of borrowing, to augment private funds, or to fill gaps in private-sector funding. There are many tried-and-true financing options that can help public agencies resolve economic development problems. They can be used separately or in combination to meet several goals, including:

- Reducing the lender's risk by providing incentives for financial institutions to help seemingly risky businesses or projects.
- Making capital more affordable to the borrower by subsidizing or eliminating the interest charged on targeted loans.
- Providing flexible payment terms to the borrower, such as allowing loans to be repaid over a longer period of time or providing an initial grace period, which gives lenders incentive to be more flexible.

For decades, Federal, State, and local governments have used or sponsored public finance mechanisms to stimulate economic activity in certain geographic areas or industries. Increasingly, publicly driven economic development initiatives are reaching into new sectors and incorporating new concerns, such as environmental improvement. However, public-sector finance programs that cross traditional spheres of activity to address complex new situations such as site contamination, cleanup, and related liability issues must be carefully planned. To provide a sense of the diverse public-sector financing options, several Federal, State, and local and initiatives that can assist industrial site cleanup and redevelopment are described in the following sections.

State and Local Initiatives

Several States are considering new types of financial assistance programs targeted more directly to the needs of projects that face environmental difficulties; Michigan and Pennsylvania have developed such programs. Moreover, several local jurisdictions, including Joliet, Illinois, and Erie County, New York, have established policies, programs, and partnerships to stimulate economic development activities that take environmental concerns into account.

Michigan. Michigan's Site Reclamation Grant and Loan Program provides funding for the environmental remediation of a site based on environmental factors and the site's economic development potential. This program was one of the first in the Nation to link cleanup with economic development opportunity. One program official described it as "a cleanup program with a twist." The program is funded through an $800 million State "quality of life" bond issue approved in 1988. The Department of Natural Resources (DNR) administers programs funded by the bond proceeds. Approximately $45 million was set aside for the site reclamation program, which began operating in July 1991. Funds were allocated as follows:

- $40 million to clean up so-called Act 307 sites, those that are not eligible for financing under Michigan's State Superfund law but have economic development potential meriting consideration.
- $5 million to investigate vacant industrial sites and abandoned manufacturing facilities that have not been designated as Act 307 sites.

Local governments eligible to apply for grants and loans need not own the sites assisted under this program, since they can convey funds to the owners for project activities.

Michigan's Department of Commerce (DOC) and DNR jointly rank project proposals on the basis of environmental and economic development criteria—especially job creation and tax-base impact—and make funding recommendations each quarter. Program officials obtain additional resources from repayments of loans and the sale of properties that used grants to help finance cleanup and improvements.

Program resources may be used to conduct environmental studies and carry out remediation plans. DOC has established a separate fund, known as the Commercial and Industrial Rehabilitation/Redevelopment Grant and Loan Program, to complement the site reclamation program. This initiative provides resources for activities beyond those undertaken by the DNR program. The DOC program finances property acquisition, construction, demolition, site clearance, facility rehabilitation, and related activities. In addition, DOC will help inventory and promote sites that have the potential for reuse, and will help assemble financial packages for projects that complement the DNR site reclamation program.

Pennsylvania. Pennsylvania has adopted an Industrial Communities Action Program (ICAP) that provides grants to bring blighted industrial sites into productive use. Local governments, industrial development agencies, and redevelopment authorities can apply for ICAP grants to acquire land and buildings, demolish and clear sites, construct or renovate public infrastructure or on-site private utilities, clean up hazardous wastes, and excavate or otherwise prepare a site for new development. Individual grants are limited to $1.5 million or half the total project cost, whichever is less.

ICAP links economic development potential with a site cleanup strategy. The main criterion for program funding is the effect that the project will have on a community's development climate. According to program officials, ICAP demonstrates the feasibility of reuse partnerships that require flexible packaging of diverse public and private resources. During 1988, ICAP supported 53 projects and attracted $53 million in total investment. In the second year, more than $156 million was invested in 117 projects. Most program resources have been used for the demolition and cleanup of old steel mill sites.

Joliet, Illinois. In 1984 Congress authorized the I&M Canal National Heritage Corridor, an initiative that involves various levels of government and numerous private interests. The corridor, more than 120 miles long and encompassing 42 communities and several Chicago neighborhoods, was developed to encourage cooperative land management, resource protection, and economic development in participating jurisdictions. The Upper Illinois Valley Association (UIVA) is the leading private-sector organization working to coordinate the corridor's diverse economic interests and implement its development plan. Association members include business, industrial, and civic leaders from Chicago and the corridor suburbs. UIVA's mission is threefold: to encourage economic revitalization of aging communities through site reuse and historic preservation, promote tourism based on the corridor's heritage and recreational resources, and undertake public education on the economic advantages of the area.

UIVA has organized an effort to revitalize a 170-acre, largely abandoned former U.S. Steel site in Joliet. Because of this effort, an important working partnership has emerged between USX Realty Co. (a division of USX), the city, and the State. The partnership prepared an initial reuse feasibility study and a plan for a heritage business park that recognized the site's historic industrial structures for marketing purposes. When implemented over the next 15 to 20 years, the site reuse strategy is expected to create about 1,500 new jobs and attract an estimated 100,000 visitors annually to the Joliet area. Located a few blocks from downtown, the former steel mill site could eventually provide 1 million square feet of service, warehouse, and light manufacturing space. According to the plan, a U.S. Steel rod mill

would continue to occupy the central part of the site. The reuse effort would tie in with nearby redevelopment projects, including the rehabilitation of an adjoining residential neighborhood and commercial strip.

USX Realty, which owns most of the site, will prepare it for reuse. The city of Joliet and surrounding Will County offer several financial assistance programs, including loans for industrial and commercial business startups and expansions, that can be tapped as the project unfolds. As part of the State-designated Des Plaines River Valley Enterprise Zone, the area also could take advantage of various revitalization incentives. In addition, the State offers numerous economic development programs that could support the project with financing for activities ranging from infrastructure improvement to development of small-business incubators.

Erie County, New York. In 1991 the New York legislature authorized the Horizons Waterfront Commission to establish in the western part of the State "a waterfront which is available to all of its citizens, which reaches its fullest economic potential, and which is environmentally sound." The commission has adopted a long-term plan to guide the revitalization and reuse of the Erie County waterfront, which was the site of numerous heavy industrial operations. The plan calls for development, during the next 20 years, of 3 million square feet of office space, 300,000 square feet of retail space, and 2 million square feet of industrial space, in addition to housing, recreational facilities, and tourist attractions.

The Horizons Waterfront Commission is working with the city of Buffalo and other communities in the area to develop local implementation plans and procedures that will ensure compatible waterfront planning, zoning, and land-use regulation. A key aspect of this effort will focus on the environmental difficulties faced by development agencies and private investors. The target area contains many contaminated sites. As the Horizons plan states, "The ability to reuse properties contaminated with hazardous, radioactive, or toxic wastes is crucial." The plan addresses the effort needed to achieve a cleaned-up waterfront and the factors that must be considered, including:

- Uncertain timeframe for carrying out cleanup activities.
- Physical condition of each site after remediation.
- Availability to potential site developers of loans and other types of financial assistance.
- Possibility that site owners or operators will continue to bear environmental liabilities, even after remediation is complete.
- Public perception of the safety and acceptability of formerly contaminated sites.

As the commission noted in its plan, cleanup is generally carried out on a site-by-site basis, making formulation of a comprehensive reuse strategy difficult. Site assessments and cleanup recommendations have been completed for only a few of the contaminated waterfront properties. To enhance the potential for site reuse, the commission must avail itself of the opportunity to influence remediation approaches, encourage public and private contributions to the cleanup effort, and attract the desired development to the waterfront area.

Brownfields and HUD: Programs To Support Site Reuse

The U.S. Department of Housing and Urban Development (HUD) can play a critical role in industrial site reuse. Cities and towns across the country already use HUD resources to support a wide variety of financial assistance programs—loans and loan guarantees,

grants, and technical assistance—that help spur economic revitalization and growth. Despite some program limitations, HUD's efforts have considerable potential to encourage the renovation and reuse of older industrial facilities and to focus on environmental concerns. Furthermore, several proposed HUD economic development initiatives, described in the following section, could further enhance the agency's ability to help tackle the brownfields issue.

Community Development Block Grants. The Community Development Block Grant (CDBG) program is one of the most useful ongoing Federal efforts to provide direct funding for activities that support the reuse of industrial sites. Distributed by HUD according to formula, CDBG resources can be used for grants, loans, loan guarantees, and technical assistance activities. Large and small cities have used block grants to finance the rehabilitation of privately owned buildings and sites by covering specific costs related to labor, materials, construction, or renovation. CDBG funds also can pay for services such as entrepreneurial counseling, preparation of work specifications, loan processing, and site inspections. This flexibility makes the program a highly versatile tool to stimulate private investment in targeted distressed areas, such as those with a concentration of abandoned or obsolete industrial facilities. Thus, block grant funds are particularly well suited to the new generation of industrial site reuse projects with environmental concerns.

HUD has determined that both environmental review and the cleanup of identified hazards are eligible CDBG expenses. Some communities, however, have had trouble carrying out these activities because of differing HUD area office interpretations of the appropriateness of such projects. Block grant funds also may cover the costs of new environmental investigative procedures developed by the American Society of Testing and Materials to identify toxic hazards at a site. Like all efforts supported by CDBG resources, activities aimed at identifying and/or remediating environmental contamination must meet one of the program's national objectives: providing benefits to low- and moderate-income persons, aiding in the elimination or prevention of slums or blight, or meeting other urgent community needs.

Section 108 loan guarantees. A related HUD program, Section 108 loan guarantees, enables local governments to finance physical and economic development projects that are too large for up-front financing with a single-year CDBG grant. Under Section 108, localities issue debentures to cover the cost of such projects, pledging their annual block grants as collateral. The debentures are underwritten and sold through public offering by a consortium of private investment banking firms assembled by HUD. The Department guarantees each obligation, in order to ensure a favorable interest rate. While local governments can use their annual CDBG allocations to pay off these obligations, most use income generated by the development project itself for some or all of the payments. Eligible activities include property acquisition, clearance or rehabilitation of obsolete structures, construction of public improvements such as water and sewer facilities, and site improvements. Brownfield projects also can be financed through Section 108 guarantees; site preparation activities may include removal of hazardous wastes and toxic contaminants.

Activities undertaken with loans guaranteed under Section 108 must meet the basic requirements of the CDBG program, and many CDBG rules also apply to Section 108 guarantees. For example, supported projects must meet one of the block grant program's national objectives. In addition, loan guarantee applicants must fulfill CDBG citizen participation requirements for the HUD-supported portion of the project. Therefore, Section 108 assistance devoted to site remediation must describe the activity in sufficient detail to allow local residents to determine the degree to which they will be affected by the proposed project. Clearly, both Section 108 and CDBG resources are well suited to an industrial site

reuse strategy and could spur the revitalization of deteriorated, often contaminated sites. In addition to creating new economic opportunities for low- and moderate-income and economically disadvantaged persons—the program's primary mission—such a use would further the elimination of blight by helping to correct conditions deemed harmful to public health and safety.

Empowerment Zones and Enterprise Communities. Empowerment Zones (EZs) and Enterprise Communities (ECs) are designated geographic areas targeted to receive special treatment and incentives in order to attract private investment and other economic activity. Benefits can include financial, regulatory, and technical assistance. The Omnibus Budget Reconciliation Act of 1993 authorized HUD and the U.S. Department of Agriculture (USDA) to designate 95 ECs (65 urban and 30 rural), and 9 EZs (6 urban and 3 rural). Designation brings several benefits to the selected areas, including special Industrial Development Bond issuing authority, investment incentives, an employer wage credit, up to $3 million in social-service block grants, and special Section 179 expensing rules.

Applicant jurisdictions were required to specify the way the resources would be applied to the problems of economic distress and unemployment in their areas. The Department's rules for the selection process encouraged communities to consider several types of economic development activities as part of their plan, including purchasing or improving land or facilities, creating revolving loan programs, and establishing job training programs. One goal of the EC and EZ programs is the creation of lasting partnerships among various levels of government and the private sector that will lead to better resource coordination and the elimination of unnecessary regulatory barriers that hamper investment and job-creation activities.

State and local governments nominated distressed communities to compete for the authority to provide such incentives to companies in their areas. The applications were evaluated by HUD and USDA officials, and winners were selected in December 1994. Many of the applicants identified the problem of brownfields as an important community issue and stated that finding a way to cope with associated barriers was one of the critical elements of a successful local economic revitalization strategy.

Community Development Banks. In July 1993 the Clinton administration proposed the creation of a national network of new community development banks that would target capital to distressed communities underserved by traditional lending institutions. While recognizing the need, Congress chose to provide funding to existing entities rather than to establish a new network. In August 1993 the House of Representatives and the Senate enacted legislation that created the Community Development Financial Institutions (CDFI) fund, a new Government entity designed to channel capital to participating lending institutions. Potential partners include community development credit unions, revolving loan funds, minority-owned banks, micro-loan funds, and other community development organizations whose primary mission is to provide capital, credit, and development services to economically distressed areas. In most cases, CDFI grantees must match Federal investment on a dollar-for-dollar basis, and institutions may receive up to $5 million over a 3-year period.

Although rules governing this program have yet to be finalized, community development banks could play a critical role in bringing necessary capital to site reuse projects, which find it increasingly difficult to secure financing at any cost. Many such sites are located in the distressed areas that serve as the focus for prospective CDFI lending.

Prospective HUD economic development programs. In 1994, as part of its package of HUD legislative proposals, the Clinton administration proposed several new programs intended to support the newly authorized EZ and EC initiatives and to enhance local efforts to promote economic development, job creation, and strategic and regional planning. The President proposed several new categorical grants that would be awarded competitively, including:

- The neighborhood-based Leveraged Investments for Tomorrow (LIFT) program, to encourage investment in large, nonhousing neighborhood revitalization projects.
- The Economic Development Initiative (EDI) is to be funded with $100 million in grants to complement the Section 108 loan guarantee program by providing resources for interest buydowns or loan loss reserves, thus expanding Section 108's practicality and usefulness.
- A new Community Viability Fund, totalling $100 million, to provide funding for development of the technical capacity of community-based organizations and to promote neighborhood, city, and regional planning efforts.
- Special grants to support projects related to housing and economic development in areas designed as ECs or EZs.

The 103d Congress considered these proposals during its deliberations on HUD reauthorization, with both House and Senate reauthorization bills (H.R. 3838 and S. 2281, respectively) containing some variation of each. Ultimately, though, this reorganization failed to pass. A new reauthorization attempt in the 104th Congress, HR 3740, introduced on June 27, 1996, would have allowed "the removal of toxic materials and other contaminants from properties" as activities eligible for CDBG and Section 108 funding. However, given the press of the schedule at the end of the legislative session (late September 1996), this bill is not likely to pass.

Properly packaged, these legislative changes could be used creatively to lay out consistent local procedures for identifying the extent of contamination at old industrial sites and supporting the activities necessary to bring the sites back to productive reuse. There is every indication that members of Congress will continue to push for new programs along these lines and that legislation will be introduced at the beginning of the 105th Congress, early in 1997.

One key issue for HUD is how a community can show that blight will occur because of environmental contamination. To demonstrate such a connection, HUD might require written documentation from a lender that has refused to provide financing for a property transaction or improvement because of concerns about the cost of environmental cleanup or liability. Such documentation would constitute sufficient evidence that a site is blighted. Quantification of the impact of environmental contamination is best done through a site-by-site characterization rather than on an areawide or regional basis. The size of the site and the nature of the contamination determine the overall impact. In either case, unchecked contamination of groundwater, dust, and soil can affect adjoining sites and undermine their economic viability.

In the past, CDBG's potential as an economic development tool has been constrained by regulations—both the rules themselves and their interpretation and implementation by certain HUD Field Offices. Many communities have struggled with regulations that required them to provide more extensive documentation than their staff could manage in order to prove that their efforts helped low- and moderate-income persons. The difficulty in compiling this

documentation in a consistent and timely way, often derailed projects. Now, HUD is facilitating the use of block grant funds for economic development by streamlining the documentation required for justification. As a result, local officials will be more likely to turn to CDBG and Section 108 as they put together the financial packages needed to tackle the problems of brownfields and to take advantage of the investment opportunities that arise from site reuse.

Critical Brownfield Issues for Further Research

Confronting environmental and economic issues that affect industrial site reuse requires a deliberate, multidimensional approach. A consistent lesson of successful reuse projects is that parties whose views often conflict—environmental and economic development professionals, private developers, and preservationists—must learn to work together. A significant obstacle to reuse is the fact that these diverse interests often focus on only a narrow part of the problem, ignoring other important issues. For example, a single-minded emphasis on cleanup has led many property owners simply to cap a site to prevent contamination from spreading. Such actions, however, prevent any further development or use of the property. Similarly, if economic development is the sole objective, many developers will ignore previously used sites in favor of undeveloped locations, despite the need for new infrastructure and the potential environmental damage caused by such practices.

The problems associated with industrial site reuse are complex and diverse, and a practical research agenda must reflect them. In order to provide the appropriate framework within which specific issues can be addressed, the research must focus on a number of broad issues. These issues include the topics discussed below.

Liability

The issue of liability needs to be clarified so that the "innocent landowner" defense and the "secured creditors exemptions" can become part of a responsible approach to the problems that lenders and developers face when considering old industrial sites for redevelopment. How can lenders acquire a better understanding of the way Federal and State programs affect their activities? What types of education and outreach programs will be most effective in explaining the legal and regulatory issues governing brownfield redevelopment?

Process Certainty

A clear, recognized, expedited, and responsible process must be established to govern voluntary cleanups, which are essential if site reuse is to be viewed as a workable community revitalization strategy on a more extensive scale. Voluntary cleanup programs offer many benefits: more sites will be cleaned by private parties, new cleanup technologies will be introduced, and a less adversarial process will develop. But, given the fact that various sites pose differing hazards and challenges, how can States and communities respond flexibly *and* responsibly to maximize redevelopment of brownfields? What is the best way to bring order to this murky aspect of the economic development process? How can HUD and other development-oriented agencies find a suitable answer to the basic question of "How clean is clean enough"?

Financing

Site assessment and cleanup require financial resources that many firms lack and find difficult to secure. Lenders have valid concerns about borrowers' creditworthiness and their ability to assume sufficient debt to carry out both cleanup and reuse activities, and

about the potential loss in value of the collateral. Yet lending practices and stipulations often result in the wholesale denial of credit to projects at older industrial sites—in effect, redlining the brownfields, or brownlining. Without adequate financing, private reuse projects cannot go forward—a situation that further undermines local development initiatives and minimizes the social and economic benefits to cities and their residents.

The answers to the following questions may help to remedy this situation. What are the most appropriate financial incentives that will ensure site cleanup and reuse? Is there a mechanism for detecting environmental discrimination in lending, such as a modification of the Community Reinvestment Act? How can State or local programs be revised to become better suited to the support of brownfield projects? Should money for cleanup and reuse be linked to a site, or to an individual company? Can resources to aid distressed or abandoned industrial properties be targeted more effectively? Can program selection criteria include recognition of the special financing needs of many contaminated inner-city properties with a low value? How can HUD programs and rules be modified or interpreted so that they will be better able to serve the needs of distressed brownfield sites?

The Challenge: Confronting Environmental and Economic Issues That Affect Reuse of Brownfield Sites

If industrial site reuse is to succeed in achieving its full potential as an economic recovery and growth initiative, a national strategy must be framed that builds on the findings of the questions posed above. Such a strategy must address investor and developer concerns in a way that is environmentally responsible. Congress and the Executive branch must provide the framework for responsible cleanup and rehabilitation if widespread reuse of contaminated industrial sites is to be encouraged and the greatest benefits realized. National action is needed to establish the consistent standards demanded by developers and lenders and sought by local officials, particularly in light of the complexity of industrial site reuse and the rapidly advancing technologies associated with pollution detection and remediation. Although private developers and State and local governments often raise the specter of "Federal interference," the Federal Government is in the best position to define a framework for determining the true risks associated with old industrial sites and to identify standards for cleanup and remediation. Moreover, Federal agencies often are best suited to structure the types of financing needed for environmentally responsible cleanup and reuse.

Underutilized or abandoned facilities are a national concern, and the combined efforts of the public and private sectors will be needed to bring prosperity back to these sites. Although the obstacles to revitalizing old properties are formidable, they are not insurmountable. Clearly, the benefits of industrial site reuse are considerable.

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