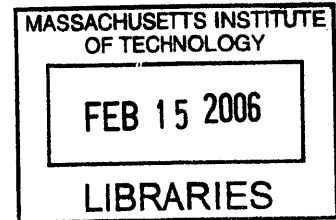


Investigating Mothballed Brownfield Properties:
Understanding the Causes and Potential Solutions

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ABSTRACT

An interview survey with 14 participants representing large corporations, non-profit organizations, regulatory agencies, and law firms was performed to determine the barriers to redeveloping brownfield properties and the proposed policies that might reduce the likelihood of mothballing properties. Based on these interviews, two overarching factors leading to mothballing include the on-going threat of liability for past disposal practices and land values that are too low to make assessment and cleanup an economically viable option for the disposition of a mothballed brownfield property. Even though federal and state statutes were amended to facilitate assessment and cleanup of contaminated property, the specter of the strict liability scheme enshrined in the environmental statutes in the 1980s still haunts corporate owners. Land values are also an important consideration for large property owners. If the sale of the property cannot at least pay for the assessment and cleanup of the property, site owners are less likely to sell the property and prefer to mothball until economic conditions are more favorable. Large property owners need to realize that the regulatory climate of the 1980s is no longer applicable in light of the amendments to federal and state environmental statutes and the enactment of new federal and state brownfield regulations. These new brownfield regulations have a respectable record of completing brownfield cleanup and reuse projects with little recourse to re-openers. For sites located in areas where property values are low, newly available financial incentives including tax credits for remediation costs, lower-cost insurance policies to cover remaining long-term concerns, and better application of engineering and institutional controls can all help manage long-term risks to sellers while improving the economics for a property transaction. The underlying premise here is that risk can be managed and need not, necessarily, be eliminated altogether. This approach to cleanup balances multiple considerations, including costs, public health risk, end use, community acceptance, and technical feasibility.

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1.0 Introduction

The U.S. Environmental Protection Agency (USEPA) defines brownfield properties as abandoned, idled, or underused industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination. (USEPA, 2005a). The number of brownfield properties across the U.S. is staggering: approximately 400,000 to 600,000 brownfield properties exist across the urban, suburban, and rural landscape in this country (Brachman, 2004). The impact of not developing brownfield properties contributes to blight, weakens municipal tax bases, increases unemployment, and affects human health and environmental quality.

The persistence of this phenomenon can be traced back to the enactment of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), also known as Superfund. CERCLA, passed by Congress in 1980, gave the federal government the regulatory tool to clean up contaminated sites. CERCLA adopted a broad interpretation of the “polluter pays” principle and forced various responsible parties to pay for the cleanup at contaminated sites (Trilling, 1999, Geltman 2000; Hise and Nelson, 1999; Kessler, 1997). USEPA’s enforcement of CERCLA included a strict liability scheme and stringent cleanup standards. These two factors resulted in lengthy and expensive cleanups. Since 1980, the states have enacted their own versions of Superfund with similar results. The federal and state superfund laws can pose significant barriers to redevelopment of brownfields. Some critics even contend that these superfund laws create new brownfields because property owners fear the liability and high costs

associated with the redevelopment of their properties and decide to either abandon or mothball the properties.

The goal of this paper is to determine the barriers to redeveloping “mothballed” brownfield properties. A mothballed brownfield property is defined as a property, usually owned by a large corporation, that is underutilized, undeveloped or left vacant to avoid the liability and remediation costs associated with redevelopment. In addition, this paper proposes regulatory policies that might reduce the likelihood of mothballing brownfield properties.

Although mothballing brownfield properties is widely practiced, it is a little known phenomenon. Two assumptions are widely believed to contribute to the practice: the on-going threat of liability for past disposal practices; and land values that are too low to make assessment and cleanup an economically viable option for the disposition of a mothballed brownfield property. This paper evaluates these two assumptions. The target stakeholders for this investigation were large corporations. In addition, the perspectives of other stakeholders actively involved in brownfield issues, such as non-profit organizations, regulatory agencies, and law firms, were also sought.

The following section (2.0 The Brownfield Challenge: Legal and Policy) provides a review of how the enactment and administration of CERCLA and the various state superfund laws contributed to the mothballing of brownfield properties. This section also summarizes the changes made by USEPA to CERCLA in response to criticisms regarding the liability provisions of the statute, as well as the development of state

voluntary cleanup programs to address brownfields as a way to manage the liability, strict cleanup standards and costs imposed by the statutes.

The next section (3.0 Stakeholder Interview Process) describes the methods used to collect information from the stakeholders. This section also lists the questions that guided the interview process. The following two sections (4.0 Barriers to Brownfield Redevelopment; 5.0 Policies to Limit Mothballing Practices) identify the factors leading to mothballing brownfield properties and policies that might reduce the likelihood of mothballing, respectively.

Finally, the last section of the paper (6.0 Conclusions) summarizes the likelihood of implementing new policies under the existing regulatory framework. This section concludes with recommendations for further research to undertake into the mothballing brownfield properties phenomenon.

2.0 The Brownfield Challenge: Legal and Policy

This section summarizes the federal and state regulatory statutes that have created obstacles to dispose brownfield properties (i.e., assessing, remediating, selling, and redeveloping). The perceived regulatory climate, even with recent amendments to the federal and state superfund laws and the creation of a federal brownfield statute and state voluntary cleanup programs for brownfields, continues to dampen efforts to redevelop brownfield sites.

2.1 Impact of Federal and State Superfund Statutes

The decline of the industrial and manufacturing sectors in the latter half of the 20th century resulted in the proliferation of vacated or abandoned properties, often with real or perceived contamination (Brachman, 2004). Estimates of the number of brownfields range from 400,000 to 600,000 sites in the U.S. (Brachman, 2004); however, the extent and magnitude of the problem is difficult to define because some sites have not been identified or evaluated. Sites designated as brownfields include abandoned or idle warehouses, manufacturing sites, gas stations and dry cleaning businesses. Most of these sites are only marginally contaminated, if at all. The greatest concentration of brownfields occurs in the Midwest and Northeast due to their industrial past; however, the sheer number of sites identified as brownfields poses a problem across the United States (Hudak, 2002).

Following the decline of the manufacturing sector, the enactment of statutes to regulate the threats to public health and the environment from the legacy of past disposal

practices by the manufacturing sector compounded the problem (Brachman, 2004). When Congress enacted CERCLA (Superfund) more than two decades ago, Congress wanted to make sure that polluters, rather than taxpayers, paid for environmental cleanups (Brachman, 2004; Pepper, 1998). Following the federal government's lead, forty-nine states also enacted their own version of the Superfund law (Klodowski, 2000).

Although there are more than twenty federal laws that regulate hazardous substances, only CERCLA mandates the cleanup of existing contamination (Hudak, 2002). The liability scheme for the federal and state superfund laws is strict, joint, several, and retroactive (Trilling, 1999; Pepper, 1998):

- **Strict liability** means liability without fault or negligence. Under the Superfund laws, liability automatically extends to determination of certain parties, including: 1) current owners and operators of a facility; 2) former owners and operators; 3) parties involved in transporting hazardous waste; 4) banks and other financing institutions; and 5) generators that arranged for waste disposal.
- **Joint and several liability** is a long-standing common law rule that applies in cases where there is more than one responsible party, and in which harm is indivisible. Under this type of liability, each responsible party can be held liable for the entire cost of cleanup.
- **Retroactive liability** applies to responsible parties for activities prior to CERCLA's enactment in 1980, even though their actions may have been legal and non-negligent at the time they occurred.

The use of strict, joint, several, and retroactive liability in CERCLA and state superfund laws has been highly effective in getting responsible parties to the negotiation table; however, it has exacerbated the difficulty of bringing brownfields back into productive use (Galvez, 2002). Even brownfields with low levels of contamination are

tainted under CERCLA's strict liability scheme which may encourage the abandonment or mothballing of properties (Brachman, 2004; Hudak, 2002).

2.2 Changes to the Federal Superfund Law

Facing public criticism regarding CERCLA, USEPA has instituted changes to the statute to facilitate new and faster cleanups of contaminated sites. In 1986, the "innocent landowner defense" was added to CERCLA relieving of liability subsequent property owners who "did not know and had no reason to know" of contamination (USEPA, 2005b). The new property owner is required to conduct due diligence investigations into the previous ownership and uses of the property. Property purchasers are also provided liability relief if they knew about site contamination, but had no hand in actually creating it (USEPA, 2005b).

Another exception to CERCLA liability is the 1996 Asset Conservation, Lender Liability and Deposit Insurance Act. This legislation applies to lenders and fiduciaries that did not participate in the day-to-day management of contaminated sites (Brachman, 2004). The law defines what "participation in management" means and describes how banks can foreclose on contaminated property without incurring the liability. This legislation also exempts municipal governments from liability arising from the involuntary acquisition of property through bankruptcy proceedings, tax delinquency, or abandonment. In 1997, the federal tax code was amended to allow the deferral of taxes over several years for qualified remediation expenditure deductions (Brachman, 2004).

In 2001, Congress passed the Small Business Liability Relief and Brownfields Revitalization Act that exempted small businesses, contiguous property owners, and

prospective purchasers from Superfund Liability (Brachman, 2004). Furthermore, the new brownfield act provided funding to assess and clean up brownfields, clarified CERCLA liability protections; and provided funds for state and tribal programs (USEPA, 2005c).

Despite the changes to CERCLA and the enactment of the Federal Brownfield Act, none of these provisions applied to property owners who were responsible for contaminating their property. Even if the responsible property owner assessed and cleaned up the property, the owner could still face potential enforcement actions arising from CERCLA.

2.3 State Superfund Laws and Brownfield Programs

At the time CERCLA was enacted, forty-nine states soon enacted their own version of Superfund with similar authority and provisions as the federal statute (Hudak, 2002).¹ Faced with the same criticism as CERCLA and the growing problem of brownfields, all states except North and South Dakota have developed brownfield Voluntary Cleanup Programs (VCP) (Leigh, 2004). Depending on the state, some VCPs form a component of the state's hazardous waste program, whereas other VCPs exist as a stand-alone statute (Hudak, 2002). The building blocks of most state programs include funding streams and financial incentives, variable use-based numeric cleanup standards,

¹ The laws range from copies of the federal statute to some state-specific requirements (Klodowski, 2000). A state Superfund program contains the following key elements: 1) Authority to take emergency response or environmental remediation activity; 2) Financing of staff, studies and remediation; 3) Authority to compel responsible parties to study sites or perform cleanup; and 4) State lists and cleanup standards. In addition, each state uses different standards to determine eligibility for the list: some states include petroleum product contamination; some classify sites according to cleanup priority; and some states have developed a Hazard Ranking System procedure.

institutional controls, liability relief from third party actions and from public actions, and assurances that no further enforcement actions will be made against developers by state or federal authorities once a cleanup has been conducted (Leigh, 2004).

Although the state VCPs introduce some finality into the cleanup process via a state sign-off and release from future liability, this release varies in strength between and within the various programs (Hudak, 2002). Eligibility for liability protection varies depending on the parties' role in the contamination at the site. Finally, some states reserve the right through re-opener clauses to reassert liability under certain circumstances (e.g., the state can pursue a party for remediation and cost recovery of previously unknown contamination that is discovered after liability protection has been given) (Hudak, 2002).

In addition, USEPA has signed memoranda of agreements with 22 states that provide assurances that as long as cleanup of those sites satisfies state standards, USEPA is unlikely to pursue remediation of a property that has already obtained state approval and release from liability (USEPA, 2005d). Just as with state releases from liability, USEPA retains the right to re-enter a case under certain conditions (USEPA, 2005d). Thus, liability protection under state law does not automatically insulate a site owner from liability under federal law.

2.4 Brownfield Phenomenon Still Persists

Despite changes to the environmental statutes and the creation of new brownfield programs, many site owners still fear the liability of costly cleanups and remediation and prefer to mothball their properties. In a study that evaluated the costs for demolition and

cleanup of 65 sites across the country, the average cost was approximately \$36 million per site (XL, 2002). Although not all brownfield sites would incur these costs, it is nevertheless evidence that site assessment and cleanup can be costly. A consequence of this chilling effect on brownfield redevelopment is that economic opportunities bypass communities thereby threatening neighborhood stability, public health and safety, quality of life, and economic development (Front, 2001).²

In a 2001 survey, 180 cities estimated over 19,000 brownfield sites lay within their jurisdiction (SERC, 2002). This figure represents more than 178,000 acres, which exceeds the combined total land area of Atlanta, Seattle, and San Francisco. Most states have addressed some of the barriers to brownfield reuse by designing their own programs and demonstrating that there are many different ways to reach the common goal of site

² There is evidence that economic opportunities are created in neighborhoods following brownfield redevelopments. For example, under California's voluntary cleanup program, 1,400 acres of brownfield land were made available for redevelopment by 1998 resulting in the creation of more than 21,000 jobs, \$475 million in tax revenue, and opened 13 million square feet for office, commercial, recreational, and industrial uses (Bartsch et al., 1999). In Pennsylvania, 15,000 jobs were created from the redevelopment of 487 brownfield sites (Bartsch et al., 1999). And in Rhode Island, an estimated 965 jobs were created from the redevelopment of 21 brownfield sites and generated \$1.48 million in sales and property taxes and more than \$3.3 million in collected income tax revenue (Bartsch et al., 1999).

At the community level, brownfield redevelopment projects create jobs and tax revenue while eliminating urban decay and easing expansion into suburban and rural areas. For example, in Bridgeport, Connecticut, the abandoned and decaying Jenkins Valvesite plant used to be an eyesore at the gateway to the city. The city redeveloped part of this brownfield into a new 5,500-seat baseball stadium, and plans to use the additional land for an indoor ice rink and museum. The stadium alone created 361 jobs, 68 of which are permanent (Gernstein, 2002). In Buffalo, New York, the former Republic Steel site - once considered hopelessly contaminated - was converted into a \$16 million, 22-acre hydroponic tomato farm and greenhouse facility (Gernstein, 2002). This redevelopment created 175 new jobs. The decaying Spicklemier Industries complex in Indianapolis, Indiana, was converted into a 20,000-square-foot office space and a self-storage facility (Gernstein, 2002). Before redevelopment, the land was appraised at \$182,500; the current value is \$2.62 million (Gernstein, 2002).

cleanup and reuse (SERC, 2002). Since the enactment of the first VCPs in 1988 in California and Minnesota, approximately 16,000 sites across the nation have gone through the state programs by 2001-2002 (SERC, 2002). However, these redeveloped brownfield sites represent less than 4% of the estimated 400,000 to 600,000 sites in the U.S. At this rate, it will take decades to address the current problem, not including the addition of future brownfield sites to this list.

The following chapters report on the barriers and constraints of redeveloping brownfields leading to mothballing of properties and the regulatory policies that can be crafted to enhance the redevelopment of mothballed brownfield properties.

3.0 Stakeholder Interview Process

This chapter describes the methods used to conduct telephone and in-person interviews with various stakeholders from large corporations, non-profit organizations, federal and state agencies, and law firms. This chapter also presents the questions used to structure the interviews.

3.1 Interview Approach

A list of 22 potential participants was generated from past professional contacts by the author and the thesis advisor for this project. Each potential participant identified was initially contacted via e-mail. The e-mail briefly described the goal for the study and solicited permission to conduct a direct interview at a mutually agreed time. For those willing to participate in the interview, assurances were given that their identity and/or the identity of their firm would be protected.

Fourteen participants agreed to participate in the interviews. Of the fourteen, twelve interviews were done via telephone and two interviews were completed in person. The participants represented large corporations (5), non-profit organizations (4), regulatory agencies (3), and law firms (2). Table 1 presents the participants in this study. Some information is omitted from Table 1 to protect the confidentiality of the participants and/or their affiliation.

3.2 Interview Questions

After a brief presentation of the goal for the study, the following questions were used to guide the interviews. Depending on the affiliation of the participant, some of the questions were omitted (e.g., regulatory agencies do not own properties that are underutilized); however, the goal of the interview was to obtain information as it relates to mothballing and policy changes that might reduce the practice. Interviews generally lasted 45 minutes to one hour. The questions posed to the participants included:

- Does your firm own properties that are vacated or underutilized?
- If so, what are the barriers leading to the underutilization of the property? Were the factors environmental? Legal? Market? Economic? Regulatory? Community? Institutional?
- What impacts have local, state or federal regulations had on your decision not to use the property?
- What was produced at the facility? Alternatively, what were the operations at the facility?
- Is there any known environmental contamination associated with the industrial processes at the facility?
- What is the likely future use for the property?
- If the regulatory environment was to change, what policies would you like to see happen to facilitate the sale or the redevelopment of your property?

The next two sections identify the factors leading to mothballing brownfield properties (Section 4.0) and the policies that might reduce the likelihood of mothballing (Section 5.0).

4.0 Barriers to Brownfield Redevelopment

Based on the interviews, this section discusses the barriers to brownfield redevelopment that appear to lead to the mothballing of property. The barriers are classified into three broad categories: legal, economic, and institutional. Table 2 summarizes the factors leading to mothballing.

4.1 Legal

At the heart of the legal barriers to brownfield redevelopment is the liability issue. As mentioned earlier, the federal and state superfund laws held site owners and operators liable for the cost of a cleanup, regardless of whether or not they actually polluted the site. Although CERCLA and state superfund laws have been amended since their enactment to streamline cleanups of contaminated sites, the specter of strict, joint and several, and retroactive liability scheme is still effective in causing site owners to consider mothballing their property. For large corporations, the assessment of the potential liability is the key factor in determining whether the site is sold for redevelopment or retained to control access and future liability (Brachman, 2004). Keeping a site mothballed is often used to avoid immediately triggering requirements to resolve potential environmental liabilities. Mothballing property is often a preferred option over selling or transferring ownership, because those other options are more likely to trigger requirements for environmental assessments and remediation. By mothballing property, corporations maintain title to the property, typically fence it off from access, and pay taxes (Brachman, 2004). These actions prevent future and/or new uses for the

property that may impose liability on the corporation at a future date (Brachman, 2004).

The liability concerns include:

- Uncapped liability
- Lost of property control

These concerns are discussed in more detail below.

4.1.1 Uncapped Liability

Although federal and state environmental agencies have enacted changes to limit the strict liability scheme in the earlier environmental statutes, past regulatory actions against large corporations have created a climate where property owners assume that future liability claims are likely. For example, a large corporation crafted an agreement with a purchaser that included an indemnification provision from future liability associated with the cleanup of the property (i.e., to guarantee against any loss which another might suffer from unknown lawsuits or claims stemming from the environmental conditions on a property). Because the new site owner did not perform an adequate site cleanup, the original site owner was held liable for cleanup costs. The indemnification provision did not offer protection to the original site owner because the new owner was not financially secure. Most interviewees say that this prevents the redevelopment of brownfield properties and promotes mothballing of sites.

With the creation and enactment of state voluntary cleanup programs targeted at brownfields, site owners may voluntarily clean up contaminated properties. Most voluntary cleanup programs, such as the brownfield programs in Massachusetts, Ohio, Michigan, Colorado, and Pennsylvania, issue some liability assurance that their cleanup

was satisfactory and releases the volunteer from future liability for the site; however, the strength of these assurances varies considerably among the state programs (Hudak, 2002). These liability releases provide written assurances that the government will not sue responsible parties with respect to pre-existing contamination; however, the agencies will limit them to existing conditions and, usually, to information known to the government as of the date of signing (Meyer, 2000; Hudak, 2002). Future uses of the property may be restricted through the imposition of institutional controls to protect prospective tenants and purchasers. Should there be any new releases, substantial change in kind or duration of exposure to existing contamination due to a shift in use of the property, or should the remedial technology not meet performance standards, the government reserves the right to reexamine the feasibility and extent of cleanup (Meyer, 2000; Hudak, 2002). For example, because asbestos and asbestos-containing debris from military buildings demolished decades ago was discovered in soil, the state agency issued cleanup orders for asbestos removal to levels much lower than historically required. Development work was halted while asbestos containing soil was excavated from a residential neighborhood and hauled offsite. Some homebuilders withdrew from the project while the local redevelopment authority and developers argued with the military and the state environmental agency over who is responsible for the estimated multi-million dollars in cleanup costs. This is a classic example of a regulatory re-opener, which can halt or delay brownfield redevelopment. Regulatory re-openers happen when changes in regulations, technological advances or the discovery of previously unknown contamination result in unanticipated regulatory involvement.

In addition, the state assurances do not necessarily protect the site owner from further federal action, even though some states have signed memoranda of agreements (MOAs) to limit such action (USEPA, 2005d). Participants in state voluntary cleanup programs for which there is a MOA, receive the benefit of an assurance from USEPA stating that the cleanup meets their standards; however, USEPA retains the right to re-open a case under certain conditions (USEPA, 2005d):

- Release or threat of release may present an imminent and substantial endangerment to public health or the environment;
- The State requests the Administrator to take action;
- The response action is not protective of human health or the environment; and
- Cleanup of the site is no longer protective of human health or the environment, as determined by the Administrator or the State, because of a change or a proposed change in the use of the site

Currently, USEPA has established MOAs with 22 states (USEPA, 2005d).

One often-overlooked liability concern is associated with the transportation and disposal of remedial wastes by a third party to an off-site hazardous wastes disposal facility. One corporate participant brought up this issue as a concern for future uncapped liability (i.e., unlawful or unregulated disposal of waste may have created a new contaminated site for which the owner does not hold title to the property but retains the liability associated with the remedial waste). Even though the responsible party performed an environmental site assessment and remediation under CERCLA or state superfund statutes and met all their obligations for their property, the unregulated or

illegal disposal of remedial wastes by a third party can be a liability for corporations. For example, a large corporation entrusted the transport and disposal of its remediation wastes to an off-site disposal facility. Because the off-site disposal facility was not operating in compliance with environmental statutes in effect at the time, the corporation, in addition to several other companies, was held liable for the cleanup of its wastes at the disposal facility. Essentially, responsible parties can end up paying twice for cleanup (i.e., at the original release site and at the disposal site).

Under these conditions and the perceived threat of liability, site owners will prefer to mothball their property rather than face the added potential liability and costly cleanup of off-site disposal facilities.

4.1.2 Loss of Property Control

Participants from large corporations and non-profit organizations involved in brownfield redevelopment stated that the loss of property control is also a major liability concern. Because of the liability, site owners prefer to control the future uses of the site by holding onto the property. Even if the property is no longer used, mothballing a property is preferred to the fear of uncapped liability associated with potential exposures to on-site contamination by new property owners through new or alternate activities on the property.

In addition, many corporations fear the liability associated with the lack of control over institutional controls imposed on the property once it is out of the hands of the

original owners.³ Their fear is that a future landowner may redevelop the property while ignoring the institutional controls imposed on the property. Later, the original owners of the property may become involved in a third-party lawsuit alleging health issues.

Although some states have provided protection to the original owners under this scenario (e.g., Massachusetts), corporations must still defend themselves from third party lawsuits and may be liable for additional cleanup and fines. For example, a large corporation was held liable for the presence of a chemical at a facility almost five decades later. The property had been sold with the understanding that the property was for industrial uses only, which was judged to be an acceptable use for the site. The industrial property was bought and sold several times without any incident. The last owner to sell the property had fraudulently omitted the condition that the facility was to remain industrial. Instead, the owner sold the property as live-in studios. After some time, tenants began to complain of adverse health effects. Residual contamination at the facility was found to have caused these health effects. A search of previous owners identified the original owner of the property that was held liable for the multi-million dollar cleanup of the property even though the property was considered safe for industrial purposes.

³ Institutional controls are legal or institutional requirements that establish procedural and physical barriers to restrict certain activities on or access to specific properties. They can be implemented by proprietary controls within a deed or other property document. Ideally, environmental restoration would always return a parcel of property to a condition allowing unrestricted use; however, the cost would be too high in many instances. In order to insure that whatever action is taken is protective of human health; institutional controls must insure that there is no complete exposure pathway. The most common institutional controls include deed restrictions and zoning ordinances. These controls notify the public and the property owner that the property's permitted use must be maintained, unless the condition requiring the deed restriction is remedied. Restrictions might include prohibitions against digging further than a certain depth, drilling a well for drinking water, or using the property for residential purposes. They can also require the installation and maintenance of access limiting measures, such as warning signs or fencing.

4.2 Economic

Economic conditions are also important barriers to the redevelopment of contaminated sites. The principle economic barrier is the real estate market. If property values are too low, then it is not profitable to initiate a cleanup and the property will be mothballed until real estate conditions improve. Other economic conditions include unknown cleanup costs and lack of funding for assessment and cleanup indemnification relief.

4.2.1 Local Real Estate Market Conditions

Many corporate participants indicated that land values determine whether a site owner should proceed with assessment and cleanup of a site prior to disposal for redevelopment. If land values are depressed, as in parts of the Midwest, it may not be economically feasible to clean up a brownfield site for resale (i.e., the costs associated with the assessment and cleanup may exceed the value of the land). Under those conditions, site owners prefer to mothball properties and wait until market conditions are more favorable. If land values are high, such as those in the Boston or New York City areas, then site disposal becomes a more economically viable alternative to mothballing a property and carrying the costs associated with mothballing (i.e., property maintenance, security, taxes, and unrealized profit from an asset).

4.2.2 Unknown Cleanup Costs

At least one participant in every group indicated that the unknown costs associated with site assessment and cleanup are a deterrent to the redevelopment of brownfields and contribute to mothballing of properties. The cleanup costs can be

considerable. The costs for demolition and cleanup of 65 sites across the country average approximately \$36 million per site (XL, 2002). Although most brownfields are not highly contaminated, assessment and cleanup costs associated with the larger brownfield sites may be significant. Under federal and state superfund programs and brownfield statutes, the responsible parties are liable for cleanup costs (i.e., no funding). Based on the interviews with the corporate participants, all were willing to participate in funding the cleanup of contaminated sites; however, costs associated with the no-end-in-sight remediation have caused financial difficulties for some corporations (e.g., WR Grace, Monsanto/Solutia). Based on this past experience, corporations are unwilling to pursue environmental site assessments and cleanups without clear and agreed upon endpoints for a site. If the regulatory climate is such that it becomes too costly to address contamination at a site, site owners will prefer to mothball the property.

In addition, several corporate and non-profit participants said that when faced with a surplus of property, corporations prefer to mothball rather than face unknown assessment and cleanup costs. Conditions leading to surplus property include:

- A shift of production capacity to another location;
- A shift in the core business operations (e.g., when a petroleum company is getting out of the bulk oil storage to focus on natural gas distribution);
- Installation of new technology that improves efficiency of a plant's production making other production facilities less competitive;
- Acquisition of other companies' production capacity leading to overcapacity; and
- The aging of plant production facilities.

Furthermore, many corporations do not have a policy in place regarding the assessment and divesting of surplus or unwanted property. Essentially, a manufacturing company's core business does not generally include the assessment of environmental conditions and the redevelopment of real estate. A corporation is at a disadvantage when it comes to releasing the property to the real estate market based on the company's own institutional barriers (e.g., lack of internal communication between corporate departments, lack of contact between head office and widely distributed plants). Under these conditions, properties are more likely mothballed.

4.3 Institutional

Because of the regulatory framework that was set up under CERCLA and subsequently under state superfund laws, site assessment and cleanup may fall under more than one legal jurisdiction. In this scenario, conflicting regulatory goals increase the likelihood that site owners do not want to clean up a site and prefer to mothball the property.

Site owners must often deal with conflicting regulatory agendas from federal, state, and local agencies. Although some MOAs exist between the federal and state agencies regarding brownfields, most other states without a MOA in place do not have a coordinated approach for addressing mothballed properties. Multiple bureaucratic layers tend to increase the likelihood that a site owner may need to deal with several regulators from different agencies. This increases the difficulty for site owners to get consensus among regulators and buy-in from the agencies. For example, a large corporation owned a vacated brownfield property in the Midwest with low-level groundwater contamination.

The site owner was required by the USEPA to clean up the surficial groundwater beneath the site to federal drinking water standards. The drinking water standards were considered too stringent by the state agency because the surficial groundwater was not considered as a source of potable water by the city (based on organoleptic quality and low production potential rather than contamination). This additional burden to meet conflicting standards points to the overlapping jurisdictions and the application of inappropriate criteria.

Although many states have moved away from default cleanup standards for all sites based on residential use, background, or pristine conditions, some states may still require the use of the default residential cleanup standards to assess potential future conditions (e.g., “what if the site could be used for residential purposes”) even if the site is designated for industrial uses only based on the surrounding land uses and zoning. For example, a multinational chemical corporation had to perform a site environmental assessment and cleanup using residential standards to account for potential future uses even though the future uses of the site were for recreational purposes only.⁴ The corporation gave the land to the town as conservation land. The site owner was held to a higher standard for the site even though the property was to become conservation land for recreational uses only.

⁴ This was generally the practice to include the residential scenario for future conditions, even though a known future use for the site did not include residential development.

5.0 Policies to Limit Mothballing Practices

In response to the analysis of factors leading to mothballing, this section presents policy measures that could limit mothballing and increase the likelihood of redevelopment. The policy measures are grouped into three categories: legal, economic, and institutional. Table 3 summarizes the policies that could limit the practice of mothballing.

5.1 Legal

The double threat of liability and high cleanup costs increases the likelihood that many landowners of industrial sites will prefer to mothball their properties rather than sell or redevelop. If the threat of liability is removed or substantially reduced, the owners of mothballed sites are more likely to accept opportunities to transfer the property to new owners. Based on the responses from most of the participants, policies to remove or significantly decrease the threat of future liability and better monitoring of institutional controls would significantly increase site owners' level of confidence that future legal action is unlikely, resulting in a decreased incidence of mothballing properties.

5.1.1 Remove or Reduce the Threat of Subsequent Liability

Past legal action, rigorous cleanup standards, and expensive remediation, hallmarks of environmental statutes from the 1980s and early 1990s, have continued to haunt site owners. Under the current regulatory framework, responsible parties are held liable for the assessment and cleanup of past chemical releases; however, many site owners further assume that uncapped liability is still prevalent. Many corporate

participants indicated that the corporations are willing to spend the money to clean up a site because it makes good corporate sense (e.g., eliminates carrying charges for mothballed properties, potentially realizes some revenue from the disposal of unwanted property, and results in goodwill and benefits for adjacent communities). However, the threat of future liability is a primary concern for corporations. Many corporate, non-profit, and legal participants in the interviews advocate for the removal of future liability threat.

The threat of future liability should not be removed because it ensures that site assessments and cleanups will occur that are protective of human health and the environment. Conversely, the goal is to increase the level of confidence for site owners by significantly reducing the threat of liability for the site assessment and cleanup that adequately address and limit potential exposures to contamination on a property. Site owners should be aware that the threat of revoking covenant-not-to-sue or no further action letters is rare. Simons, Pendergrass and Winson-Geideman performed a study that investigated the incidence of re-openers through a systematic inventory of voluntary cleanup programs (VCPs) (Simons et al., 2003). The results of their study show that out of 11,497 environmental cases only 12 cases were reopened or approximately 0.1% of the cases (Simons et al., 2003). Based on the results of this study, brownfield site owners need not fear the possibility of additional assessment and cleanup once the site has met the state's voluntary cleanup requirements. This low rate of re-openers will result in more affordable liability protection insurance and increase a site owner's level of confidence that future negative outcomes can be avoided. (Simons et al., 2003). This

study provides evidence that the threat of uncapped liability arising from re-openers in state VCPs is significantly lower than assumed by corporate America.

Furthermore, USEPA does not generally anticipate taking removal or remedial action at sites involved in State VCPs with signed USEPA/State MOA (USEPA, 2005d).⁵ Each state's MOA protects program participants from federal enforcement actions under CERCLA as long as they comply with the provisions set forth in the state's VCP. The overlapping nature of state and federal laws regarding contaminated property makes the MOA valuable to program participants because it provides liability protection on two levels. Through the MOAs, the USEPA acknowledges the adequacy of state VCPs. USEPA's intention is to rely on the state VCPs to be responsible for addressing sites within the scope of MOAs.

Under the current regulatory framework, this policy is being implemented. Because new or amended federal and state brownfield programs have been enacted in the past five to ten years, property owners may not be fully aware that the regulatory climate is significantly different now than what it was in the 1980s and early 1990s. Although many of the brownfield statutes still require responsible parties to clean up contamination, site owners should also be aware that uncapped liability is a product of past environmental legislation adopted during a climate of fear. If the assessments and cleanups are performed according to the environmental statutes currently in place, it is unlikely that the regulatory agencies would require further action against the responsible parties in the future.

⁵ USEPA virtually never evaluates or reviews voluntary actions, confining itself to properties on the National Priorities List (NPL-Superfund) and candidate NPL sites (Simons et al., 2003).

5.1.2 Monitor Institutional Controls

Corporate and non-profit participants want to see better monitoring of institutional controls applied at a site. There needs to be a mechanism that is triggered whenever the title of a property is transferred to a new owner. The institutional controls need to follow the title of the property and need to be reviewed at the local level to ensure their integrity during the redevelopment of the property. Included in this action is the need to more carefully and more clearly craft institutional controls that are explicit and easily understood. Inherent to the use of institutional controls is a clearly thought out process that includes potential contingencies for the potential future uses of the site. For example, the institutional controls for the Industriplex site in Woburn, Massachusetts, anticipated future redevelopment at the site. One institutional control was the preclusion of digging below three feet; however, the installation of utilities for any future redevelopment would require excavations beyond three feet. To attend to this matter, engineered controls consisted in the installation of concrete utility trenches on the site for future redevelopment. Furthermore, a colored barrier was used to indicate when excavations occurred in a restricted area beyond the imposed limit of three feet.

The clear policy goal here is to provide a level of confidence to site owners that institutional controls imposed on the site run with the property title for the land. For this to occur, it is imperative that institutional controls be attached to the title of the property so that a local review agency can quickly assess whether a planned redevelopment on the property will contravene those controls. It is not possible for a previous site owner to keep track of the redevelopment activities that can occur on a property over time; nor is it

expected that state or federal agencies adequately kept track of redevelopment activities on industrial properties within their jurisdiction. Because real estate transactions occur at the local level, these controls need to be administered at the local level. In order to achieve this goal, a local municipal or regional office needs reliable access to current information regarding institutional controls within its jurisdiction. Because federal and state environmental agencies are closely involved in the negotiations for the selection of institutional controls rather than the local government (e.g., municipal government), the federal and state agencies need to set up and maintain their respective databases of information regarding the institutional controls put in place on a property. Then local governments can access these databases to monitor the sites within their respective jurisdictions. For example, a local government can verify information on the databases prior to issuing a redevelopment permit for a property to ensure the integrity of institutional controls and that construction workers are operating in a safe environment.⁶

Furthermore, local government can help monitor the integrity of institutional controls more frequently due to the relatively smaller number of sites under its jurisdiction. The benefit would be to detect site conditions (e.g., arising from mismanagement of site controls by current property owner) that could endanger human health or the environment. For example, a recent GAO report cited an example at a Superfund site where a restriction on groundwater use had been violated for more than a

⁶ This policy would operate on the same principle of contacting “Dig Safe” prior to excavation activities on a property. Dig Safe is a non-profit corporation located in New England, funded entirely by member utility companies, to promote public safety, protect vital utility services and safeguard against property and environmental damage. State laws in New England require anyone who digs to notify utility companies before starting. Dig Safe will identify where utility lines are located on a property.

year before being discovered by USEPA during a five-year review; more than 25 million gallons had been extracted for drinking water (GAO, 2005). Because another entity assumes responsibility for long-term monitoring and enforcement of the controls after USEPA's involvement, effective oversight requires that USEPA be able to readily identify which sites have institutional controls in place and whether the controls are being monitored and enforced by the appropriate agency. USEPA has recently begun implementing institutional control tracking systems for sites under the Superfund and RCRA corrective action programs. The Institutional Controls Tracking System (ICTS) was designed with the capability to track controls used in a variety of hazardous waste cleanup programs. The objectives of ICTS include improving information exchange with individuals interested in the productive use of a site after cleanup, and allowing notification to excavators of areas that are restricted or need protection prior to digging.

Institutional controls play an important role when a cleanup is conducted and when it is too difficult or too costly to remove all contamination from a site (USEPA, 2005e). Successful implementation of institutional controls includes (USEPA, 2005e; ELI, 1999):

- Early consultation with local governments and any other organization that may be responsible for implementing controls;
- Improving coordination among federal, state and local governments in the selection, implementation and operation of controls;
- Better budgeting and funding of the tasks associated with implementing and operating controls;
- Increasing public participation in the selection of controls;
- Educating the public about controls to be used and in use at a site; and

- Monitoring and enforcing the controls.

As the brownfield statutes mature and are successfully used to redevelop brownfield properties, both regulators and property owners are becoming more familiar in their application. Institutional controls are becoming more sophisticated in their uses and application, even considering potential future activities at a site. Federal and state regulators are also aware that regular monitoring of each redeveloped site is a daunting task and recognize that local agencies need to be involved. The federal government has begun tracking their sites in a data base. Some state agencies are also doing likewise. The logical next step is to improve the quality and completeness of information in the data bases and allow that information to be shared with local governments. Under the current regulatory framework, this policy could be easily developed. As stipulated in the GAO report and by USEPA (GAO, 2005; USEPA, 2005e), local governments need to be included in the process since real estate deals occur at the local level. Additional funding from the federal and state governments may be required to fully implement this policy. The goal would be the administration and monitoring of brownfields over a smaller geographic area which in turn would increase the level of confidence by site owners that institutional controls are being respected while allowing the redevelopment of the property.

5.2 Economic

Almost all participants advocated that economic incentives coupled with substantially decreasing or removing the threat of liability would increase redevelopment of mothballed brownfield properties. The use of economic incentives discussed below

could help decrease the likelihood of mothballing while creating opportunities for both sellers and buyers to redevelop a brownfield property. This in turn would enhance the socio-economic conditions in the surrounding communities. In addition to the economic incentives discussed below (the carrot), there are new accounting regulations that will increase the accountability of corporations regarding the assumed financial liability associated with mothballed properties (the stick).

5.2.1 Tax Credit and Tax Incentives

As discussed earlier, one of the main reasons large corporations decide to mothball properties is due to low real estate values for property. Low real estate values make it economically unfeasible for large corporations to initiate site assessments and cleanups. If a corporation can sell a property that in itself pays for the site assessment and cleanup (i.e., break even), then the site owner may decide to initiate activities to dispose of the property. If this economic situation is not achievable, site owners will mothball the property until the real estate conditions improve. For those borderline sites (i.e., the break-even sites), financial incentives may be required to encourage the redevelopment. If property values are low, this economic condition can be offset by providing some financial incentives, such as tax credits or incentives, to initiate site assessment and cleanup.

There is a bill that will soon be re-introduced in Congress that would allow a property owner to deduct 75% of remediation and demolition costs as a credit against income tax provided that the responsible party pays 25% of the costs (Superfund Report, 2005). Eligible expenses include costs associated with site assessment, monitoring,

operation and maintenance, and cleanup. As described in the new bill, the tax credit can also be used by responsible parties.

USEPA's Brownfields Tax Incentive is intended to remove many of the financial disincentives preventing the cleanup and reuse of blighted property located in economically depressed communities (USEPA, 2005f). Eligibility requirements include the presence or potential presence of hazardous substances on the property and ownership by the taxpayer incurring the eligible expenses for use in a trade or business or for the production of income (USEPA, 2005f).⁷ To meet the geographic requirement, the property must be located in one of the following areas:

- EPA Brownfields Assessment Pilot areas designated prior to February 1997;
- Census tracts where 20 percent or more of the population is below the poverty level;
- Census tracts that have a population of less than 2,000, have 75 percent or more of their land zoned for industrial or commercial use, and are adjacent to one or more census tracts with a poverty rate of 20 percent or more; and
- Any federally designated Empowerment Zone or Enterprise Community.

The Brownfields Tax Incentive encourages brownfield redevelopment by allowing taxpayers to immediately reduce their taxable income by the cost of their eligible cleanup expenses. This incentive creates an immediate tax advantage from these expenses, helping to offset short-term cleanup costs. Under the Brownfields Tax Incentive, environmental cleanup costs are fully deductible in the year they are incurred. The federal government estimates that while the tax incentive may cost approximately \$300 million in annual tax revenue, the tax incentive is expected to leverage \$3.4 billion

⁷ Sites listed, or proposed for listing, on EPA's National Priorities List are not eligible for the tax incentive.

in private investment and return 8,000 brownfields to productive use (USEPA, 2005f). This ability to spur investment in blighted properties and revitalize communities makes the tax incentive a valuable tool for restoring brownfields. The Brownfields Tax Incentive was extended, to cover qualifying expenditures from the original date of the incentive's enactment, until midnight of December 31, 2005 (USEPA, 2005f).

Many of these policies are currently being implemented or considered (e.g., tax credit for remediation). Brownfield site owners need to be more aware of the various tax credits and incentives available to them, especially for those properties where remediation costs would exceed the value of the land. Under these circumstances, tax credits/incentives may improve the economics of a real estate transaction.

5.2.2 Environmental Insurance

Many corporate participants would like to see better protection from third-party lawsuits and other site-related liabilities in the form of environmental insurance policies and indemnification. When first introduced, environmental insurance was expensive and provided limited coverage. As insurance carriers became more comfortable in underwriting the insurance policies (as evidenced by the limited number of sites being evaluated due to re-openers), environmental insurance is a more attractive risk-reduction technique. Site owners can now use environmental insurance to quantify the cost of environmental risks and transfers those risks onto an insurance policy for a fixed price (Abelson and Doukas, 2004). Environmental insurance products now play a critical role in many transactions. The following two main products are particularly beneficial to

parties involved in brownfield purchases, sales, ownership, reuse, and redevelopment (Abelson and Doukas, 2004).

Pollution Legal Liability (PLL) Insurance: PLL insurance is used by the seller and/or the buyer to transfer the risks of cleanup costs for unknown preexisting or new environmental conditions, third-party liability (bodily injury, property damage, and diminution in value), transportation and disposal of waste materials from cleanup activities, and loss of income/extra expenses caused by pollution conditions. PLL insurance protects the seller by backing up the indemnification given to, or received from, a buyer. It can also protect sellers from third-party liabilities resulting from their interest in the divested property. PLL insurance can protect the seller from changes in regulations or new regulations that impose new liability for cleanup.

Cleanup Cost Cap Insurance: Introduced in the mid-1990s, the cleanup cost cap insurance is used to manage the financial risk associated with unexpected cleanup cost overruns. The policy pays for costs in excess of the estimates contained in a remedial action plan (RAP), plus some buffer layer (approximately 10 to 20 % of the estimated budget). The policy responds when cleanup costs exceed the RAP estimates plus the buffer due to the discovery of more contamination than was expected or off-site cleanup costs for known pollution that has migrated. The product can also be structured to provide contingent coverage for an owner who reacquires remedial liability should the buyer become insolvent and fail to complete the cleanup.

As more and more brownfields are redeveloped and the rate of sites being re-investigated is low, the costs associated with these types of insurances will decrease over

time. As mentioned earlier, these insurance instruments may significantly improve the economics of a real estate transaction.

5.2.3 Create Brownfield IRA Accounts

One of the more innovative suggestions would be the creation of a corporate-owned brownfield account where the proceeds, contributed by the corporation, would be tax-free and earmarked for future cleanup and settlement for any potential lawsuits. Since securing resources to pay for site cleanup is the most difficult financing aspect of many brownfield projects, a “brownfield IRA” would encourage companies to earmark funds for site assessment and cleanup (including demolition). The account would be set up essentially like a personal retirement account where the installments are tax-free. The money can then be used for the assessment and cleanup of a property before transfer of ownership. The account would be fully funded by the corporation. Although the brownfield IRA account has been discussed, there is no evidence that this proposed financial option is currently being considered by the federal government.

5.2.4 Sarbanes/Oxley Act and Financial Accounting Standard 143

One regulatory agency participant⁸ mentioned that provisions in the Sarbanes-Oxley (SOX) Act and the Financial Accounting Standard (FAS) 143 might have a strong impact on the brownfield market by increasing scrutiny on environmental disclosure in financial statements. As opposed to the previous incentives, these accounting procedures may act more like a stick to force corporate owners to disclose environmental liabilities.

⁸ It is interesting to note that only one participant mentioned this potentially important change in accounting procedures for environmental liability. The potential reason is likely that these accounting changes are too new and will become only effective for the fiscal year ending after December 15, 2005.

In the past, generally accepted accounting principles (GAAP) have not required companies to report liabilities for environmental contamination, such as asbestos-containing materials in buildings or contamination of soil and groundwater, in the absence of pending or threatened legal proceedings.

Public and non-public companies that prepare audited financial statements will be required by FAS No. 143, "Accounting for Asset Retirement Obligations (ARO)", to report previously undisclosed liabilities for environmental cleanup obligations associated with environmentally impaired properties and facilities when the fair value of such obligations can be reasonably estimated (Rogers, 2005).⁹ This accounting requirement becomes effective for fiscal years ending after December 15, 2005 (2006 for calendar-year companies).

Since the enactment of the SOX Act in 2002, many experts speculate that increased scrutiny of assets and liabilities might spell the end of mothballing (Rogers, 2005). SOX Act Section 404 (which requires an independent audit of a company's internal financial controls) and FAS 143 require companies to inventory their mothballed sites and book the related costs associated with site cleanup (Leone, 2004). Failure to do so under Section 404 could expose the company to bad press, a Securities and Exchange Commission investigation, and shareholder lawsuits against the company and the board (Leone, 2004). Although these accounting provisions are still too new to fully assess their impact, it will be interesting to see if SOX in combination with FAS 143 become

⁹ AROs are legal obligations associated with the retirement of a tangible long-lived asset (e.g., property, plants and equipment) that result from the acquisition, construction or development and/or the normal operation of the asset.

potentially strong inducements to decrease the practice of mothballing and increase the likelihood that the site will be cleaned up.

5.2.5 Tax Property for Highest and Best Use

One regulatory participant proposed that in order to limit the mothballing of brownfield sites, local jurisdictions should tax property at the potential highest and best uses for the site. In this manner, the assessed tax would be at the much higher rate than if the property is assessed under current conditions (vacant lot or disused/abandoned buildings in poor conditions). This policy change could be an incentive for the owner of a property to dispose of it more quickly.

Although the intent of the policy is reasonable, the implementation may prove problematic. First, who decides what the highest and best use will be for the property? Second, how will the process be applied equitably for all sites? Third, because taxes are based on the combined assessed value of the land and structures, there is no way to determine what the value of the land and structures will be in the future. Fourth, the extent of contamination on the property may prove to be too great to allow for a profitable redevelopment at the highest and best use. Finally, the reality of the real estate market may not coincide with the highest and best use for the property (e.g., highest and best use for the property as residential housing; however, there is an abundance of available housing in the community).

5.3 Institutional

Many of the participants stated that in order to move forward in the redevelopment of brownfield properties, greater coordination among regulatory

stakeholders is needed. For brownfield redevelopment to increase, the federal and state regulatory agencies must defer to the local jurisdiction because property redevelopment occurs at the local level. In addition, there should be a standardized approach used nationwide to evaluate risks at a site.

5.3.1 Improve Coordination among Agencies

Many corporate participants would like to see a more coordinated effort among the federal, state and local governments. Coordination is improved where states have a MOA with the federal government regarding brownfield remediation. However, the coordination at the federal and state levels leaves out a critical player in the redevelopment of brownfields, the local government (i.e., municipalities).

In order to more clearly establish separate roles regarding liability and cleanup standards, the federal, state and local governments could each play a different role in promoting brownfield redevelopment. The federal government could provide funding and technical assistance to state agencies overseeing voluntary cleanup programs (VCPs), allowing the devolution of environmental policy to the state or local level. This process would also provide some measure of standardization across the country regarding site assessment and cleanup activities.

In turn, state agencies could work to increase the technical capabilities of officials in their environmental agencies to better prepare them to administer federal brownfield programs. States would continue to provide liability protection and defined cleanup standards through their VCPs. However, states could direct funding and technical assistance to lower governmental levels that wish to develop local, county or regional

brownfield redevelopment programs. For example, the creation of a centralized brownfield-coordinating bureau in each state would help site owners navigate the various federal, state, and other local agencies to get the appropriate information (e.g., funding, state voluntary cleanup programs, federal programs, permits, and database of sites with institutional and engineering controls). In addition, the centralized bureau would have coordinating brownfield redevelopment offices at the local level (city, county or region). Knowledgeable personnel regarding regulatory statutes, financial options, and redevelopment opportunities should staff this local office. The local contact can help direct and coordinate inquiries through the maze of bureaucracy and provide a level of comfort not found under the present regulatory framework. In addition, this system would improve the turn-around time for these projects. Decentralizing brownfield redevelopment control to the local level offers the best opportunity to identify contaminated sites and determine which of those sites could be profitably redeveloped. Putting funding in the hands of local officials would allow local government to apply their expertise regarding area interests, market trends and potential for redevelopment.

In addition, federal and state funding should be provided to the local brownfield office to create and maintain a database of all brownfield sites under its jurisdiction (e.g., brownfield inventory). This inventory could catalog the sites, identifying previous owners, type of contamination, environmental and health risks, institutional controls, estimated cleanup costs, and potential benefits from remediation including job creation and tax revenue.

These policies should be easily implemented as a natural progression from the establishment of MOAs between the federal and state agencies. As discussed earlier, these policies could easily dovetail with the creation of a local brownfield office that would manage brownfields at the local level in addition to the creation and implementation of a data base of information for brownfields. This streamlined process could expedite site preparation for future redevelopment. In the end, the twin goals of site cleanup and redevelopment help bring economic and social benefits to the local community.

5.3.2 Institute Realistic Risk Assumptions

Because of CERCLA's discretionary process for determining appropriate site remedies, the costs and length of a cleanup at a given site often vary substantially from a similar site (Hudak, 2002). To standardize the process and control costs, corporate participants advocated for the use of risk-based evaluation criteria and standardized risk assessment model to facilitate site assessments and selection of remediation technologies. The science of human health risk assessment — and our understanding of the risks demonstrably posed by environmental contamination — have advanced considerably in 25 years (Rubenstein and Gillon, 2005). Superfund was written during a climate of fear when little was known about the nature or extent of the risk posed by hazardous substances and when site remediation was the big unknown. Since the original passage of the federal and state superfund laws, the federal and state governments, and private sector have made huge collective advances in the following areas (Rubenstein and Gillon, 2005):

- Better computer imaging techniques (e.g., three-dimensional representation of chemical plume in groundwater);
- Improved knowledge in chemical toxicology;
- Improved risk assessment assumptions (e.g., better characterization of dermal exposures);
- Increased use of software for better data management (e.g., Microsoft Access); and
- Increased knowledge of remedial technologies (e.g., bacteria to breakdown petroleum contamination).

More recently, the USEPA has started to allow cleanup standards tailored to a property's designated end use as long as the standards remain within the USEPA's targeted risk range. Since the enactment of VCPs by the states in the mid to late 1990s, VCPs offer a choice of standards, rather than mandating a universal standard. By offering participants a variety of clearly defined standards closely tied to future land use, the state VCPs provide a means for property owners, prospective purchasers and developers to anticipate the degree of the cleanup required. In addition, federal and state agencies are allowing the increased use of alternative cleanup strategies, notably the use of engineering and institutional controls.

Furthermore, a market analysis may be needed to determine the highest and best use for a site based on the needs of the community (e.g., housing, recreational, commercial/retail, or industrial). The market analysis can help determine the level of cleanup (e.g., residential, commercial/retail, recreational, or industrial) and remediation that is most appropriate for the site. As part of the site analysis, corporate participants advocate for the use of a nationally recognized risk-based approach, such as the

American Society for Testing and Materials (ASTM) standard Risk-Based Corrective Action or RBCA model. RBCA provides a comprehensive modeling and risk characterization evaluations for chemical release sites. The model combines contaminant transport models and risk assessment tools to calculate baseline risk levels and derive risk-based cleanup standards for soil, groundwater, surface water, and air exposure pathways. The use of the RBCA model would harmonize the process across the country. As part of the risk-based approach, realistic regulatory limits need to be set for the site based on the anticipated use so that cleanups are expedited and less costly. The site remedial action needs to tie into the results of the risk assessment to achieve the goals of protection of human health and the environment while limiting costs on unrealistic or unproven remedies. The results of the risk assessment will help determine what type of use can be supported on the property. For example, a portion of the site may be adequate to support residential uses; whereas another portion should only support industrial/commercial uses due to the residual amount of contamination unless the site owner wishes to spend more money to clean up to residential standards.

In discussions with corporate participants, site owners expressed that they are not opposed to cleaning up contaminated sites. As one corporate participant mentioned, with the availability of new tools to help site owners better characterize contamination (e.g., groundwater modeling in three dimensions), site assessments have become much more sophisticated in recent years. Thus, a better understanding of the contamination at a site helps target the selection and implementation of appropriate remedial technologies to achieve the regulatory goal of no substantial threat to human health and the environment.

These policies are gaining wider acceptance within the regulatory and the regulated communities. As more and more brownfield sites are cleaned up and redeveloped, the development of newer assessment and remedial technologies, including institutional controls, will make site assessments and remediation more efficient and health protective. The underlying premise here is that risk can be managed and need not, necessarily, be eliminated altogether. This approach to cleanup balances multiple considerations, including costs, public health risk, end use, community acceptance, and technical feasibility (Pepper, 1998).

6.0 Conclusions

Brownfields existed long before the enactment of environmental statutes, including CERCLA and its state equivalents. The federal and state environmental statutes did not cause brownfields, but these laws raise barriers to brownfield redevelopment. Based on past regulatory actions, property owners still fear the specter of the strict liability scheme enshrined in the federal and state environmental statutes of the early 1980s. In response to the barriers posed by CERCLA, states developed voluntary cleanup programs (VCPs) as an alternative to enforcement-driven environmental laws and to encourage brownfield redevelopment. Nevertheless, the two overarching factors leading to mothballing are the on-going threat of liability for past disposal practices and land values that are too low to make assessment and cleanup an economically viable option for the disposition of a mothballed brownfield property.

Many liability examples cited by large property owners occurred prior to the enactment of states' voluntary cleanup programs and the ensuing memoranda of agreements between the federal and state governments regarding oversight for the assessment and cleanup of contaminated properties. Large corporations point to the fear of being the only deep pockets around as their reason for not redeveloping property and maintaining control of site access.

Under the current regulatory framework, it is unlikely that regulatory agencies will provide blanket immunity for liability to responsible parties once a site cleanup has been performed; nor should this threat of liability be removed. However, the threat of

revoking covenant-not-to-sue letters and other such guarantees is rare. This information suggests that responsible parties can clean up a site and dispose of the property with significant certainty that future liability is unlikely. This, of course, assumes that the site assessment has adequately characterized site conditions and that cleanup has been properly executed.

As for monitoring institutional controls, regulatory agencies need to provide a mechanism to ensure that restrictions and controls on the property are adequately monitored. Because of the sheer magnitude of brownfield sites to be monitored, the establishment of a local municipal or regional field office responsible for monitoring institutional controls under its jurisdiction would increase the level of confidence for site owners. This policy can be easily implemented under the current regulatory framework. Furthermore, the local office can perform audits within its jurisdiction more frequently. The benefit would be to detect site conditions (e.g., arising from mismanagement of site controls by current property owner) that could endanger human health or the environment. To implement institutional controls successfully on a property will require the participation of the local government as well as the surrounding community. In addition, improved budgeting and funding to operate and monitor the institutional controls will also be required.

Large property owners need to realize that the regulatory climate of the 1980s is no longer applicable in light of the amendments to the environmental statutes and the enactment of new brownfield statutes. Voluntary cleanup programs, although relatively

new, have a respectable record of completing brownfield cleanup and reuse projects with little recourse to re-openers.

The second major concern advanced by large property owners is land values.

Essentially, brownfield properties are classified by property owners into three groups:

- The first group comprises sites where remediation costs are lower than the expected sale price for the property. Under these conditions, the property will be cleaned up and sold. The threat of liability with these sites is usually low.
- The second group comprises sites where remediation costs are approximately equal to the expected return from the sale of the property. Under these conditions, a more careful assessment for the selection of remediation technologies is needed to make an informed decision to sell the property. If remediation costs are greater than the expected value of the property, there is a strong probability that the site will be mothballed until real estate conditions improve. As an alternative, the site owner may decide to impose institutional and engineering controls on the property. This action can significantly reduce remediation costs; however, the imposition of institutional and engineering controls may decrease the value of the property below the expected return and create potential future liability.
- The third group includes those sites where remediation costs far exceed the value of the property. Under these conditions, the property will likely be mothballed until real estate conditions improve and/or remediation costs decrease significantly through new remediation technologies.

For the second and third group of properties, financial incentives may be required to encourage the redevelopment. If property values are low, this economic condition can

be offset by the new tools that have emerged in the last few years to deal with these concerns, including financial incentives and bonding for cleanups with insurance policies covering the remaining long-term concerns. Engineering and institutional controls can also help decrease remediation costs by managing long-term risks to sellers while providing community protection, especially when remediation may prove too difficult or costly to remove all contamination from a site. Looking forward, companies should be given the opportunity to create a brownfield cleanup account. Tax-free contributions to the account can be made during the active use of a facility. When the property owner wishes to dispose of the property, monies invested in the brownfield cleanup account can be used for site assessment and remediation. The willingness of federal and state regulators to understand and adopt new tools to initiate brownfield redevelopment will go a long way toward reducing seller anxiety.

As opposed to the carrots discussed above, new financial accounting procedures may act as a stick for property owners who elect to mothball property. The Sarbanes-Oxley Act Section 404 and the Financial Accounting Standard 143 will require companies to inventory their sites and book the related costs associated with site cleanup. Although these accounting provisions are still too new to fully assess their impact (only effective for the fiscal year ending after December 15, 2005), it will be interesting to see if Section 404 of the Sarbanes-Oxley Act in combination with Financial Accounting Standard 143 decrease the practice of mothballing and increase the likelihood that the site will be cleaned up.

The other barriers to brownfield redevelopment include the overlapping jurisdiction and the inappropriate evaluation criteria. As mentioned earlier, coordination between the federal and state agencies is improved where states have a MOA with the federal government regarding brownfield remediation. However, this coordination leaves out a key player: the local government. In order to improve coordination among the various levels of government, the federal government's role should be to provide the funding and technical assistance to state agencies overseeing VCPs. States would then be freed up to improve technical capabilities of state regulators and direct the funding and technical assistance to lower governmental levels that wish to develop local, county or regional brownfield redevelopment programs. The local contact can help direct and coordinate inquiries through the maze of bureaucracy and provide a level of comfort not found under the present regulatory framework. In addition, the local office would create and maintain a database of brownfield sites under its jurisdiction, including any institutional controls imposed on a property, to help a developer identify potential sites for redevelopment. This streamlined process could expedite site preparation for future redevelopment, while ensuring the appropriateness of the redevelopment on the property due to the presence of institutional and engineering controls.

With the enactment of voluntary cleanup programs, state agencies allow the use of cleanup standards that are tailored to a property's designated end use. These programs allow the use of clearly defined cleanup standards that are closely tied to future land use. Correspondingly, the use of institutional controls as an alternate cleanup strategy has increased in the past ten years as a means to increase the likelihood of redeveloping a

property rather than remaining fallow. The premise here is that there will always be some risk associated with a property; it cannot be eliminated but can be adequately managed to be protective of human health and the environment.

In summary, the brownfield industry is evolving. With the recent changes to the federal and state environmental statutes and the enactment of statutes geared specifically to brownfields, the regulatory climate has changed. Not only have the rules changed for property owners, but also regulators must adapt when enforcing the new regulations; the status quo is no longer acceptable. Property owners should no longer assume that liability and uncapped cleanup costs are the norm. Instead, property owners should avail themselves of the many opportunities that present themselves for the redevelopment of brownfields (e.g., new brownfield regulations, new and less costly insurance plans, new tools for site assessments, wider acceptance of institutional and engineered controls, tax credits and incentives, new environmental disclosure rules). Although many of these changes are new and evolving, large property owners need to incorporate these factors in their decision-making process to determine the best option for their property.

Because of the evolving nature of the brownfield sector, future areas to investigate should include:

- What is the influence that a state voluntary cleanup program has on preventing the mothballing of brownfield property?
- What impact will the new accounting practices have on a company's assets and liability associated with mothballed property?

- Are properly crafted institutional controls effective in limiting a company's future liability?
- Are there distinctions in the decision-making process for mothballing property among the various industries?
- Under the state voluntary cleanup programs, how many sites are re-opened for assessment and additional remediation?

Further investigations into these areas would help improve and facilitate the redevelopment of mothballed brownfield properties.

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Table 1 Interview Participants and Affiliation

Name	Company	Interview Date	Reference
John Pendergrass	Environmental Law Institute	March 11, 2005	Pendergrass, 2005
James Sherman	Formerly of Monsanto/Solutia	March 24, 2005	Sherman, 2005
Deirdre Menoyo	Assistant Commissioner for Waste Site Cleanup, MADEP	March 24, 2005	Menoyo, 2005
James Wong	Large Multinational Corporation	March 31, 2005	Wong, 2005
Catherine Finneran	Brownfield Coordinator, MADEP	April 1, 2005	Finneran, 2005
Barbara Landau	Boston Law Firm	April 6, 2005	Landau, 2005
Mark Sloan	General Motors	April 11, 2005	Sloan, 2005
Brooke Furio	USEPA Region 5, Cleveland Office; City of Cleveland, Land Revitalization Manager	April 18, 2005	Furio, 2005
Nancy Kafka	Trust for Public Land	April 19, 2005	Kafka, 2005
Participant	Petroleum Company	April 20, 2005	Petroleum Company Representative, 2005
James Hamilton	Conservation Law Foundation Ventures	April 21, 2005	Hamilton, 2005
Vivien Li	The Boston Harbor Association	April 29, 2005	Li, 2005
Nancy Kaplan	Keegan Werlin LLP	May 6, 2005	Kaplan, 2005
Participant	Large Multinational Corporation	May 9, 2005	Multinational Corporation Representative, 2005

Table 2 Factors Leading to Mothballing Brownfield Sites

	Legal	Economic	Institutional
Corporations	<ul style="list-style-type: none"> • Losing control of property • Liability from remediation wastes • No end to liability • No control over institutional controls 	<ul style="list-style-type: none"> • Land values too low • Large costly site evaluations • Market shift/over capacity • Aging structures/inefficient production 	<ul style="list-style-type: none"> • Overlapping Regulatory Jurisdiction • Divergent regulations • Inappropriate evaluation criteria
Regulatory Agencies	<ul style="list-style-type: none"> • No liability protection 	<ul style="list-style-type: none"> • No funding for responsible party • Asking too much for property 	<ul style="list-style-type: none"> • No trust in institutional capabilities of state
Non-Profit	<ul style="list-style-type: none"> • Losing control of property • No end to liability 	<ul style="list-style-type: none"> • No funding for responsible party • Unknown cleanup costs • Market shift/over capacity • Aging structures/inefficient production 	<ul style="list-style-type: none"> • No corporate policy • Too many stakeholders • Inefficient process • Not interested
Law Firms	<ul style="list-style-type: none"> • No end to liability 	<ul style="list-style-type: none"> • Unknown cleanup costs 	<ul style="list-style-type: none"> • Site owners not aware of available programs • Not interested

Table 3 Policies to Reduce the Incidence of Mothballing Brownfield Sites

	Legal	Economic	Institutional
Corporations	<ul style="list-style-type: none"> • Institutionalize control of deed restrictions and institutional-engineering controls • Limit future liability 	<ul style="list-style-type: none"> • Create corporate-funded Cleanup IRA account • Environmental Insurance/Indemnification 	<ul style="list-style-type: none"> • Better coordination-consistency between agencies • Create one centralized brownfield bureau • Use standardized RBCA method and appropriate evaluation criteria
Regulatory Agencies		<ul style="list-style-type: none"> • Tax property at highest/best use • Tax credit/incentive for site assessment and remediation • Accounting procedures 	
Non-Profit	<ul style="list-style-type: none"> • Improve control on deed restrictions and institutional-engineering controls • Remove/restrict re-openers from covenants not to sue • Cutoff future liability 	<ul style="list-style-type: none"> • Tax credit/incentive for site assessment and remediation 	<ul style="list-style-type: none"> • Link up cleanup to market analysis • Build consensus for buyer • Include local government
Law Firms	<ul style="list-style-type: none"> • Decrease liability 	<ul style="list-style-type: none"> • Tax credit/incentive for site assessment and remediation 	<ul style="list-style-type: none"> • Create office at local level • Prepare and market inventory of properties • Remedy based on risk assessment and future use