

Mapping the Void: Brownfield Inventories by Local Governments

by

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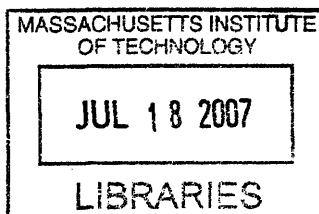
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# Mapping the Void: Brownfield Inventories by Local Governments

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## **Abstract**

Brownfields are abandoned or underused land whose redevelopment is complicated by the presence or perception of contamination. Nationally the United States Environmental Protection Agency estimates the number of brownfields to be more than half a million. As of 2002, the EPA requires states and tribal governments to inventory brownfields within their boundaries in order to receive federal funding for brownfield response programs; municipalities and regional planning offices eligible for competitive EPA brownfield grants are encouraged to first conduct a brownfield inventory. Assessment grants funding inventories are open-ended, allowing local governments to define their own methods of identifying brownfields and prioritizing parcels for redevelopment; as such there is little documentation of the way inventories are conducted. Through interviews with brownfield redevelopment professionals and inventory makers in Alabama, California, Kentucky, Massachusetts and New Jersey this thesis explores the ways local governments prioritize property types for identification, how they locate brownfields, how they incorporate community knowledge, and how inventories influence subsequent public funding allocations.

This research indicates that inventories tend to focus on large sites close to infrastructure with the intention of marketing individual properties rather than strategically incorporating brownfield redevelopment into broader urban or regional planning. While local governments frequently design inventories in partnership with and for use by non-government actors, they tend to work almost exclusively with other professional groups and have marginal success at soliciting community participation. Though inventories are meant to capture brownfields that have eluded regulatory databases of contaminant release reports, fear of litigation from injured property owners and reliance on official property records bias inventory results to represent only the most visible brownfields. I conclude that the EPA should work with planning professionals to educate inventory makers on ways of creating strategic inventories. I also assert that brownfield inventories must include community partnerships in order to align brownfield redevelopment with community objectives and explore the legal and political implications of such partnerships.

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## **The Industrial Void**

Warren, Ohio is a Rust Belt town dreaming of its Steel Belt past. About an hour from Cleveland and a little more from Pittsburgh, Warren enjoyed a post-War prosperity that financed middle-class homes with inlaid Travertine marble and mahogany banisters. Today just beyond those elegant middle-class homes the tawny and jade retention ponds of the Copperweld Steel facility curve with the narrow bends of the Mahoning River. Rust streaks the metal cladding of the Copperweld building's many additions, memories of its days as a Fortune 500 company. The 250-acre colossus is just one of many fallow industrial properties in Trumbull County. Since massive layoffs of skilled workers started in the late seventies, Warren's population has declined precipitously. Rusted phantasms of its former life haunt the streets, reminders of an extinguished vitality and impediments to even a modest recovery. Shuttering an industrial facility is cheaper than deconstructing it, and since 1980 hanging onto a property tainted with industrial chemicals can be much cheaper than selling it.

In 1980 Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), legislation which assigns complete liability for the cleanup of a contaminated property to any former owner or operator of that property. An industrial tenant responsible for one ton of contamination on a property contaminated with thirty tons of chemicals can be compelled to pay for cleanup of all thirty tons. That tenant can also be subject to tort liability for third party injuries—in the case of Copperweld Steel adjacent households whose well water has been contaminated with chemical runoff from the plant could sue for damages in civil court. But regulatory and civil actions depend on soil and water tests, tests which are not required of non-

operating industrial facilities unless the property is being considered for sale. So as long as a property does not change ownership those regulatory and punitive costs can be avoided. Of course the Copperweld property may not be contaminated; no contaminant releases are listed on the Ohio Department of Environmental Protection website. But the possibility of contamination may contribute to perception of the property as a high-risk investment, one that may lead to costs far in excess of purchase price. Vacant or underused properties plagued by the perception or real presence of contamination are called brownfields, a phenomenon recognized by the United States Environmental Protection Agency (EPA) a full decade after the passage of CERCLA.

Since 1994 the EPA has provided more than \$130 million for the assessment and cleanup of brownfields (EPA New England 2006). Many of those assessment grants funded brownfield inventories by states, municipalities, regional planning commissions or tribal governments. The EPA encourages local governments interested in redeveloping brownfields to begin with an inventory in order to strategically direct public funding for environmental assessments and cleanup. State and tribal governments are required to undertake a timely brownfield inventory under a 2002 amendment to CERCLA and are provided federal funding to meet that obligation. However, the few guidelines attached to federal funding for brownfield inventories give states and municipalities substantial discretion in designing their inventories. Because local governments are not required to report their processes for inventorying brownfields or the outcome of inventories beyond the three-year period of a typical grant, the EPA has little information on how grant recipients identify brownfields, how they prioritize brownfields to receive public funding or how effective inventories are in catalyzing brownfield redevelopment.

In theory inventories matter because they influence how public funding will be spent in the future—not just federal funds, but precious state and local funds in the form of grants, loans and contaminated properties assumed by eminent domain or tax takings. Theoretically inventories are the first time policymakers look systematically at brownfield stock and therefore influence how they develop brownfield redevelopment incentives and project review processes. For example, if brownfields are prioritized by their marketability it is unlikely the inventory will position small neighborhood brownfields for redevelopment. Additionally the participants in brownfield inventories likely shape which brownfields are identified, what characteristics of a brownfield are perceived as essential for making redevelopment decisions, and what incentives and processes policymakers institute to facilitate redevelopment. Therefore the beneficiaries of brownfield redevelopment are likely to be selected at the earliest stages of brownfield response programs.

This thesis examines how local governments have performed brownfield inventories, including who participates in inventory design, what sources they use to identify brownfields or verify prior uses, what shape inventories take in terms of content and accessibility and the political, economic and social implications of these inventories. My case studies are constructed from conversations with inventory makers in places with a variety of brownfield redevelopment experience, and include the Kenton County Land Recycling Program sponsored by the Northern Kentucky Area Planning Commission, Renew Alabama: An Alabama Redevelopment Database originated by the Regional Planning Commission of Greater Birmingham and the New Jersey Site Mart developed by the New Jersey Brownfields Redevelopment Task Force. Whenever possible I spoke

with the people who had initiated the inventory as well as the staff responsible for continued maintenance. To contextualize the experiences and beliefs of inventory makers I also spoke with the Brownfields Program Section Chief of EPA New England, a developer in Northern California who specializes in the redevelopment of environmentally-impaired properties throughout the country, and the former Assistant Commissioner of the Bureau of Waste Site Cleanup at the Department of Environmental Protection in Massachusetts.

Through these conversations I found that very often brownfield inventories do not support the most efficient or socially equitable expenditure of public funds. Across the board inventories command more resources than anticipated, often without enabling strategic decision making. The common belief that brownfield redevelopment will be market driven leads local governments to design inventories for use by real estate developers even though it appears inventories infrequently facilitate market deals without public intervention. Communities, frequently perceived as irrelevant or damaging to the credibility of inventories, have no room to participate until development deals are under negotiation. As environmentally-impaired properties in socially and economically impaired places, brownfields must be assessed by all of their attributes and by all stakeholders. Through this thesis I address the needs and modes for integrating brownfields into participatory plans aimed at reviving places and people.

## **Everything You Always Wanted to Know About Brownfields\* \*But Were Afraid to Ask**

The boom and bust of American industry can be mapped by the vacant industrial lands in our most vibrant and stagnant places. While regulatory schemes and private sector innovation have addressed many of the legal and engineering challenges of brownfield redevelopment, economic and social obstacles persist.

### **The Birth of Brownfields: Industrial Waste, Superfund and Liability**

Contaminated land has existed for as long as humans have modified their environment. Mining and metallurgy left their traces among human habitation as far back as the ages of bronze and iron. But the Industrial Revolution catalyzed resource consumption and environmental modification at an unprecedented scale, with commensurate impact on human health. Cities choked with smoke, pastures gave way to factories, and in the coal-rich regions of Pennsylvania and Appalachia, whole cities sprang up around coal veins. The pollution of the city and the industrialization of pastoral lands spurred responses from the urban naturalists designing parks in clever mimicry of natural systems to the popular mythology of the American Romantics, yawping from rooftops their visions of a natural order that may never have existed.

American industry persisted through political scandals, wars and workers' riots, transforming the recalcitrant agricultural fixation of the South and conferring prosperity on some immigrants in the Northeast and Midwest. The vast wealth and reach of the Robber Barons or Ford and his breed of industrialists obscures the neighborhood scale that characterized much of American industry. In working- and middle-class neighborhoods in Warren, Ohio and Dorchester, Massachusetts, locally-owned machine

shops, meat packing plants and water cooler factories provided jobs for skilled workers who lived within walking distance. These small-scale industrial operations sustained neighborhoods and towns, anchoring neighborhoods by providing cash flow for local shops and schools and—often by virtue of organized labor—providing dignified employment with decent wages. The less auspicious aspects of industrial operations—pungent smells, smoggy and discolored air, and polluted waterways—were perceived by many of the affected as an unfortunate but inevitable byproduct of employment and productivity (Solitare 2005).

The evolutionary trajectories of domestic politics and international economics converged to frustrate the relationship between industry and American neighborhoods. The dismantling of mass transit systems, paralleled with heavy government subsidies in freeways, facilitated an exodus of families from city neighborhoods to the new suburban rings. Racial cohesion among newly-defined “white” immigrant groups and racial tensions unresolved in the civil rights movement led to de facto segregation as white families fled to racially homogeneous suburbs and black urban neighborhoods struggled with the capital starvation of redlining practices. Regional and international economics contributed to the shuttering of industrial operations, both large and small. As the organized labor practices in the Northeast and Midwest, which enabled skilled workers to negotiate wages and benefits, tamped the profits of industry, corporations moved their operations to Sunbelt states with less sophisticated labor movements or to developing countries with far lower wages. Corporate consolidation proved too competitive for smaller industrial operations. In other cases, technological advances or resource depletion rendered specialized facilities obsolete. The confluence of these factors left vast amounts

of abandoned industrial operations: small sites even less than an acre in the hearts of residential neighborhoods, huge petrochemical or energy facilities along urban waterways, and mountains of mining tailings in tribal lands. Until the early 1980s, the redevelopment of these sites was almost entirely market-driven, enabling the ready development of homes, schools and parks on former industrial sites (Geltman 2000). The adoption of environmental regulations paralleled these economic and social pressures, converging to further reshape American industry. In 1976 Congress passed the Resource Conservation and Recovery Act (RCRA), which regulated the disposal of chemicals by active industrial operations—in essence regulating future disposal of hazardous waste (Scheller 2005). Although environmental laws governing the emissions of operating facilities emerged in the 1960s and 1970s, no statutory requirements existed for the cleanup or containment of previously disposed waste until 1980 (Scheller 2005).

Discovery of chemical pools and decaying storage drums in the suburban yards of Love Canal, New York, raised the popular perception of risk surrounding industrial contamination and made a national figure of Lois Gibb, the suburban mother who rallied for federally-guided cleanup and resident relocation. Back in the early 1900s the industrialist William T. Love developed what came to be known as Love Canal, a channel connecting the Upper and Lower Niagara Falls to generate electricity from the hydropower of the falls. When economic and technological constraints killed the canal project, the site became a municipal and chemical dump. After thirty years of multiple owners and operators depositing chemical and industrial waste onsite, the Hooker Chemical Corporation capped the canal and sold it to the city for one dollar (Beck 1979). Houses and a public school were developed on land surrounding the canal in the mid-

1950s. Though chemical leakage was investigated as early as the 1960s, the EPA cites federal investigation as having begun in 1978, after an explosion in March triggered by unusually high rainfall (Beck 1979). Chemicals leaching from their underground storage pooled in yards and basements, displaced a swimming pool, and burned children playing on soil. Residents also exhibited elevated white blood cell counts (a possible precursor to leukemia) and reported abnormally high numbers of miscarriages and birth defects (Beck 1979). Within the year, the state department of health recommended that all pregnant women and children under two years of age evacuate, and the state agreed to purchase 239 homes closest to the canal (Love Canal 2007).

The cleanup of twenty-thousand tons of chemicals forced the Environmental Protection Agency to undertake its first residential hazardous waste cleanup and thrust industrial contamination into the national consciousness (Beck 1979). A lawsuit filed in 1979 by the US Department of Justice against the Occidental Chemical Corporation (the parent corporation of Hooker Chemical Corporation), was complicated by the canal having had multiple owners and operators potentially responsible for the contamination, including the United States government (Department of Justice 1995). The scale of contamination, the stark images of chemical pools and disintegrating drums in a suburban neighborhood, and the accounts of ill and injured white, working class women and children lent the incidents in Love Canal a visibility not afforded other environmental exposures. The national focus on Love Canal led to a series of Congressional hearings on hazardous waste which revealed the limitations of existing regulations and led to the passage of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, also known as the Superfund Act (Raettig 1996).



The weight of CERCLA lies in its definition of liability for cleanup, written broadly to ensure that those responsible for contamination cannot hide behind the uncertainty created by transfers of land ownership or facility operation. CERCLA identifies all past or current owners and operators, and any parties who arranged for the disposal of waste or transported waste to the site, as potentially responsible parties (PRPs) (Burnham-Howard 2004; Scheller 2005). Liability as defined by CERCLA has three significant components: it is *retroactive*, meaning that any party who owned or operated the site may be found liable for its cleanup even if they adhered to existing laws during their time of ownership, tenancy or usage of the site; it is *strict*, meaning a party can be found liable for contamination even if they used the best-available technology to avoid contaminating the site; and it is *joint and several*, meaning a PRP can be liable for the entire cost of cleanup regardless of that party's alleged extent of contaminant disposal, length of ownership or tenancy, unless the party can prove dumping by other parties (Geltman 2000). Costs and damages include those costs associated with cleanup of hazardous materials and health studies for contaminant exposures as well as damages to natural resources (Burnham-Howard 2004). Broad liability ensures a source of funding for cleanup costs, either by pooling assets from multiple owners and operators or by assigning the entirety of costs to the party with the most assets.

In the years following the passage of CERCLA companies continued to purchase and sell industrial facilities much as they did before 1980. But as the law was tested in court and its financial implications became better defined, companies altered their behavior, becoming more protective of these potential liabilities. Major corporations especially began to regard their industrial facilities as the chink in their armor, a

vulnerable point of access to their considerable assets. While a local machining or engineering firm may not have the ability to cover costs of cleanup, usually ranging from \$100,000 to several million dollars, publicly-traded behemoths like General Electric or Boeing can afford to pay, and can be found liable for the entirety of damages under CERCLA's *joint and several* liability. As a result, companies like GE regularly mothball retired properties—fencing them off and maintaining them on their balance sheets rather than selling. Mothballing an industrial facility which the owner suspects of contamination has been regarded as perfectly legal due to a peculiarity of CERCLA which assigns no liability for cleanup until contamination is found. No statutory language compels cleanup of suspected contamination, only verified contamination, creating a “don’t ask, don’t tell” policy between companies, shareholders, and regulatory agencies. Though recent accounting reforms including the Sarbanes-Oxley Act make the practice of mothballing properties more costly and may be responsible for the recent upsurge in divestment of retired industrial facilities, it is not yet clear how broad an impact these laws will have on corporate brownfield policies (Leone 2006; Rogers 2006). All things being equal, companies prefer properties without suspected contamination to those suspected of contamination, leading to development of new industrial parcels on greenfields, the term for non-industrial, often formerly agricultural land (Geltman 2000). Aversion to investment in potentially contaminated properties extends to private lenders as well, who can be found liable for contaminated properties pledged as collateral, leading to a new type of redlining—greenlining, in which some banks routinely deny loans in communities with suspected pervasive contamination (Bartsch & Munson 1994; Geltman 2000). During the 1980s and early 1990s it became increasingly clear that the statutory language

surrounding contamination and liability had the unintended effect of arresting the cleanup and redevelopment of industrial facilities. Perception became a primary market force, a phenomenon that took almost a decade to recognize and over a decade to name.

### **The Velvet Claw: Regulatory Force and Development Incentives**

The term *brownfields*, describing abandoned and potentially contaminated properties, emerged in the early 1990s and gained salience through the advocacy and awareness campaigns of mayors in Northeastern and Midwestern cities suffering most from industrial decay. The advocacy of such mayors as Richard M. Daley of Chicago led to the first round of EPA brownfield pilot grants in the mid-1990s, still a staple of limited federal funding made available to cities for brownfield redevelopment (Sheahan & Coley 2002). Today the official definition of brownfield, as given by the EPA, is “real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant” (EPA 2007). A brownfield may be an industrial, commercial, institutional or even residential property, though most brownfields fall within the first three categories (McCarthy 2002; Alberini et al. 2004). The EPA estimates the number of brownfields in the United States at more than 450,000 parcels (EPA 2007); other estimates run to more than a million parcels (Burnham-Howard 2004). No master list of recognized brownfields exists, due to disparate regulation split among state environmental agencies and the EPA.

The EPA is the primary federal agency responsible for the interpretation and enforcement of CERCLA, as well as the primary federal agency involved in brownfield redevelopment. As such, the EPA determines federal cleanup standards for soil and groundwater according to the intended end use of the property, administers funding to

states and local municipalities for brownfield redevelopment, often in the form of grants for environmental assessment of individual properties, interprets and establishes federal enforcement guidelines for CERCLA, and prosecutes federal cases against parties found to be in violation of CERCLA. Potentially Responsible Parties can apply for federal liability relief, which protects them from future liability from previously undiscovered contamination. The Department of Housing and Urban Development also offers some grant funding for brownfield redevelopment through its Brownfields Economic Development Initiative (BEDI), used to improve the viability of development projects benefiting low- to mid-income neighborhoods.

Most states have enacted their own versions of CERCLA, state regulations which define standards for soil and groundwater cleanup and which establish guidelines and liability for hazardous waste cleanup. The Brownfields law of 2002 requires states and tribal governments to establish response programs with capacity to oversee the assessment, cleanup and redevelopment of brownfields (Tucker 2007). State environmental agencies are typically the primary agency responsible for oversight of brownfield redevelopment, funneling federal and state funding to individual projects, reviewing cleanup plans and negotiating liability indemnities with land owners, developers and other PRPs. States establish their own cleanup standards for soil and groundwater, which may be stricter than the federal standards set by the EPA. State agencies also establish institutional controls designed to limit human exposures to remnant contamination after cleanup, including deed restrictions (also known as activity and use limitations), which stipulate prohibited uses—such as gardening or water well usage—which survive title transfer. Many states have developed privatized cleanup

programs, often called voluntary programs, in an effort to ease the burden on state resources and thereby improve the speed and volume of brownfields redevelopment. As part of such privatized programs, licensed professionals with experience in environmental engineering serve as private consultants to PRPs. The autonomy and discretion afforded these licensed professionals varies by state. In some states, voluntary programs do not require state notification until all environmental assessments and remediation have been completed and the PRP files with the state for liability relief (McCarthy 2002). In such a memorandum of understanding, often called a covenant not to sue, the state agrees not to pursue legal action against the PRP in the event of future discovery of contamination, barring negligent action (McCaffery 1997). Some states and tribes have negotiated a Voluntary Response Program Memorandum of Understanding with the EPA, which extends federal liability relief to parties who have obtained state or tribal liability relief (EPA 2006).

Cities and counties typically have limited involvement with liability relief and the technical aspects of brownfield cleanup, but regularly influence the allocation of public brownfields funding from federal and state sources. Many recipients of EPA brownfields grants are local municipalities, which use the funding to build brownfield inventories, develop hazardous materials training or subsidize showcase projects meant to spur brownfield redevelopment within a metropolitan area (McCarthy 2002). Local governments tend to perceive abandoned and vacant land as economic losses, and describe brownfields in economic terms—lost taxes, decreased property values and diminished land productivity.

Though the federal and state statutes which define brownfields use the language of environmental science—contaminant dosage, risk assessment and remediation—the incentive programs designed by federal, state and local governments tend toward economic incentives targeting developers. Developers shy away from liability and unknown cleanup costs, and much policy effort is channeled into the creation of subsidies and liability relief to reduce the perceived risk of investment (Meyer & Lyons 2000; Alberini 2004). Recent federal activity surrounding brownfield redevelopment has centered on clarifying liability for prospective purchasers in an attempt to remove that barrier to private-sector brownfields redevelopment. The Small Business Liability Relief and Brownfields Revitalization Act, an amendment to CERCLA passed in 2002, attempts to clarify potential liability for prospective purchasers (Burnham-Howard 2004). The Revitalization Act also instructs the EPA to issue guidance on its “all appropriate inquiries” rule (AIA). The AIA guidance, published in 2005, requires prospective purchasers to have interviewed past and present owners, operators and occupants of a property and to have reviewed historical sources in order to gain federal liability relief (Black 2005).

Liability protection—both from additional cleanup cost and third party liability—is highly valued by developers whether or not they have experience in brownfields redevelopment (Alberini 2004). Direct public funds to subsidize environmental assessment, cleanup and development are also used as financial incentives for investing in brownfields. Less-experienced developers tend to overvalue cash incentives tagged to project completion (Alberini 2004). However, developers with brownfields experience and those who invest in large-scale brownfields projects often avoid public funding in an

effort to limit red tape and public participation requirements attached to public funds (Meyer & Lyons 2000). The level of public participation required for programs receiving public subsidies is extremely limited; if a developer uses the entirety of a \$200,000 EPA grant to pay for a truck to remove asbestos from a construction site, the developer is only required to address trucking of the asbestos at a public hearing (Tucker 2007).

The private sector has responded to the financial risk presented by CERCLA by developing specialized industries to limit liability for brownfield investors.

Environmental insurance and special purpose vehicles—partnerships created for single development projects—facilitate redevelopment of large brownfields sites by shielding developers from future liability claims and cost overruns resulting from discovery of unknown contamination (Alberini 2004; Mueller 2005). For the majority of redeveloped brownfields, cleanup is funded by private investment (Meyer & Lyons 2000). Since 1980, environmental remediation has become a big business. A wide range of remediation technologies have been developed to extract, neutralize or contain contaminants, which range from heavy metals, such as lead and arsenic, to petroleum (which is not regulated by CERCLA), to volatile organic compounds, critical intermediate chemicals for modern manufacturing. The technique used to treat the contaminated medium depends on several factors, including contaminant type, the contaminated medium (soil, groundwater or both), the intended end use of the property (residential, commercial or industrial), and the amount of funding available to pay for cleanup. Conventional remediation technologies include capping, in which the contaminated soil is sealed with layers of material which prevent human exposure to liquids and vapors emanating from the soil; soil vapor extraction, in which groundwater

contamination is pumped and treated and the cleaned groundwater is sent back into the water table; and soil excavation, in which contaminated soil is dug out, solidified (usually with concrete) and sent to a hazardous waste disposal facility (Reddy et al. 1999). With funding the typical limiting factor, “cleanup” often describes more affordable technologies such as soil excavation and soil capping.

The policy focus on developer incentives such as subsidies and liability relief overlooks other significant barriers to brownfield redevelopment, including zoning battles, demolition costs, awkward parcel sizes, suboptimal infrastructure, unqualified labor force and litigation (Alberini 2004). Additionally, brownfields in low income neighborhoods may elude redevelopment because investors prefer better-understood markets (Bernanke 2006). For example, the standard calculations of purchase power for individual households conceal the cumulative purchase power of dense low-income neighborhoods, creating misperceptions about market feasibility among lenders and developers (Seidman 2005). Such imperfect information likely will not be corrected or compensated for by environmental assessment grants and liability relief, the typical incentives of states and federal brownfield programs.

Recent brownfields support from the White House tends to focus on the economic benefits of brownfield redevelopment, emphasizing the language of investment and private sector. The language of environmental quality and economic development can conceal or distort the actual outcomes of brownfield redevelopment. Claims of improved environmental quality tend to overlook the institutional controls, such as zoning changes and deed restrictions, used to limit the extent and cost of cleanup by restricting land use to limit potential human exposures rather than removing or neutralizing contaminants



(Alberini 2004). Similarly, economic development and its benefits to populations negatively impacted by languishing brownfields may be distorted by the metrics of economic development agencies, which focus on job gain and tax revenue without necessarily tracking the beneficiaries (McCarthy 2002).

### **Brownfields and the Chronic Wasting of Neighborhoods**

The past uses and industrial histories of many cities suggest that contamination, either real or perceived, is the rule not the exception for urban properties. Many brownfields are abandoned neighborhood fixtures, such as dry cleaners and gas stations. Rural areas and tribal lands may be plagued by defunct mines or artillery ranges. While decaying industrial cores may have sprawling multi-acre sites, many brownfields are financially infeasible for individual development because they are “small, oddly shaped, poorly linked to infrastructure, or located in residential neighborhoods” (Greenberg 2002: 703). The typical size of brownfields varies according to studies, but those which focused on municipal inventories, rather than nationwide searches based on media coverage, found median size of an acre or less (Alberini 2004).

Brownfields taint neighborhoods. They threaten environmental quality and environmental health through contaminated groundwater, soil and air (through off-gassing) which can affect not only people who venture onsite but also those in the surrounding area. A study of a Baltimore neighborhood with many brownfields found high incidences of a variety of illnesses and increased mortality compared to nearby neighborhoods with fewer brownfields (Litt et al. 2002). Brownfields can introduce public health risks through criminal activities because vacant land and abandoned

buildings do not appear to be owned or tended by anyone and attract illegal uses prevented in other places by the cumulative vigilance of regular activity (Spirm 1990). Brownfields become dumping sites and criminal hotspots, introducing other forms of risk into neighborhoods (Solitare 2005). To discourage dumping and vandalism, brownfield owners erect chain link fencing around their perimeters, creating voids that fracture neighborhoods and complicate redevelopment.

Brownfields have more inertia than other abandoned or vacant sites. Unlike the vacant housing lots that perforate many declined neighborhoods, brownfields cannot be reclaimed by residents with informal pocket parks and community gardens because owners face liability from injuries through contaminant exposure. Abandoned industrial sites may evoke strong emotions and have high visibility, both for long-time residents for whom they symbolize lost jobs and economic struggles and for recent residents who may associate them with crime, vacancy and blight (Solitare 2005). But brownfields are less often cited by residents—either in personal accounts, neighborhood meetings or community mapping studies—than other neighborhood phenomena perceived with greater urgency (Vajjhala 2007; Wallace et al. 2006). Air pollution hotspots, crime-plagued corners and traffic-clogged streets, which are perceived as greater threats or inconveniences, capture more attention in neighborhood politics than industrial facilities that may have been abandoned for years. Community dialogue around brownfields usually centers on the social, transportation and economic issues related to redevelopment, not environmental contamination (Solitare 2005).

In community meetings and individual conversations feeding into a community visioning process in Dorchester, MA, residents rarely raised concerns over lingering

contamination from past industrial uses, and spent far more time discussing parking, traffic, crime and asthma perceived to be caused by buses and diesel trucks running through the neighborhood (Wallace et al. 2006). Dorchester has some of the highest poverty rates in Boston, the densest housing and many vacant and abandoned buildings, with many abandoned industrial properties embedded in residential neighborhoods. Community development corporations interested in acquiring and developing some of the brownfields along Quincy Street and Ceylon Street in connection with the potential development of a commuter rail stop had organized the visioning process to strategize acquisition and do initial legwork to establish community buy-in on future development projects. When discussing potential end uses for brownfields in the neighborhood, residents were most interested in finding out how proposed affordable housing would impact them in terms of affordability and crime, how construction jobs and long-term employment on the properties would contribute to employment of current residents, and what impact development would have on local traffic and parking constraints. When health and safety emerged, discussion focused on violence, insufficient health care and asthma, prevalent public health crises in communities of color (Wallace et al. 2006).

For many communities burdened with brownfields, the terminology dominating the language of the public and private sectors has little meaning. This mismatch is not so much a problem of vocabulary but of framing. Brownfields—as spaces of lost employment, blight and contamination—are perceived by communities as one piece of the complex landscape of neighborhood development, which cannot be captured strictly in environmental or economic terms (Solitare 2005).

Brownfields are community assets that can be leveraged to yield benefits beyond increased tax base and jobs, including open space and community venues in undersupply in many urban neighborhoods. Projects with high social return but low financial revenue demand extraordinary coordination and planning to marshal resources. Considerable planning is also necessitated for scattered, small brownfields which can be more efficiently redeveloped in coordination rather than as isolated sites (Alberini 2004). Clustered brownfield redevelopment may create economies of scale for remediation technologies and environmental insurance, provide internal subsidies to support products with lower return on investment, increase the rate of return to the developer vis-à-vis single parcel development, and provide concentrated benefit within a neighborhood (Alberini 2004). However, private industry tends to focus almost exclusively on large projects with competitive internal rates of return. If unmarketable brownfields are to be realized as community assets it will be through the efforts of local communities and the support of publicly funded planning processes aimed at strategizing brownfield redevelopment.

## **Brownfield Inventories in Practice**

To learn how local governments have undertaken brownfield inventories I interviewed EPA and state grant recipients in Alabama, Kentucky and New Jersey. My Kentucky and Alabama case studies came from the *GIS for Brownfields Toolkit* provided by ESRI at the 2006 EPA Brownfields Conference; I was referred to the New Jersey inventory by my contact in Alabama. When possible I spoke with the people who had initiated the inventories as well as the staff responsible for continuing maintenance. To contextualize my conversations with inventory makers I also spoke with brownfield professionals with experience at the EPA, the Massachusetts state environmental agency and a private developer specializing in environmentally-impaired properties.

## **Of Mandates and Muddling**

Although the majority of brownfield redevelopment projects are funded exclusively with private financing, public funding still plays a primary role in new brownfield markets and for small projects in developed markets. In fiscal year 2007 the EPA made fifty million dollars available to states, tribes and local governments to capitalize revolving loan funds for brownfield redevelopment, to purchase environmental insurance or develop other brownfield insurance mechanisms, to create brownfields inventories, conduct environmental assessments and fund cleanup (EPA 2007).

According to Carol Tucker, Brownfields Program Section Chief of EPA New England, many grant applicants are “return customers,” grant recipients from a decade ago who seek public funding to assess or remediate properties identified in brownfield inventories funded by their original grants (Tucker 2007). Though millions of dollars of public funding are spent each year based on the results of brownfield inventories, there is hardly

any transparency in the ways inventories are conducted and sparse documentation of prior inventory practices to transfer knowledge between practitioners. Consequently there is very little available information to judge how effective inventories are in spurring brownfield redevelopment.

The Small Business Liability Relief and Brownfields Revitalization Act of 2002 mandated the creation of brownfield inventories for states and tribes without a Voluntary Response Program Memorandum of Understanding, an agreement which extends federal liability relief to grant response actions that have received state liability relief. The explicit goal of these inventories is not to create a list of brownfields but to estimate the number, location and type of brownfields in state and tribal lands (EPA 2006). The unstated motivation for inventories is to justify funding requests to Congress by demonstrating the large number of brownfields across the country; the EPA Brownfields budget has enjoyed significant increases in recent years after cutbacks in the Clinton era and early years of the current administration. Though the EPA has the authority to mandate brownfield inventories for state and tribal governments entitled to federal funding to establish brownfield response programs, the agency does not have the authority to stipulate a particular inventory process. State and tribal inventories funded by authorization of section 128(a) of CERCLA must be timely and publicly available, though not necessarily web accessible. Significantly, the EPA does not require states or tribes to restrict inventories to properties with contaminant release reports, but may include any brownfield, defined as real property whose redevelopment is complicated by *real* or *perceived* contamination. The flexibility of the mandate paradoxically results in a burdensome prospect since state agencies have no idea what properties with contaminant

release reports are currently abandoned or underutilized or what abandoned or underutilized properties without contaminant release reports may be plagued by the perception of contamination. According to Dierdre Menoyo, former Assistant Commissioner of the Bureau of Waste Site Cleanup, the office responsible for brownfield redevelopment in Massachusetts (a state with a memorandum of understanding), the state negotiated with the EPA to use its 21E list, the Massachusetts Department of Environmental Protection regulatory list of contaminant release reports, as its brownfield inventory even though the list includes many active businesses that therefore are not brownfields (Menoyo 2007). While states may resist performing mandatory inventories, for many local governments a brownfield inventory is the voluntary first step in developing a brownfield redevelopment strategy. Municipalities, regional planning commissions and even federal agencies may apply for competitive assessment grants authorized by section 107 of CERCLA. The EPA recommends that grant recipients use at least a portion of their first assessment grant to conduct a brownfield inventory in order to take stock of the contaminated sites in their jurisdiction and better strategize the use of public funding for cleanup and redevelopment.

Carol Tucker (who received her Master in City Planning from MIT's Department of Urban Studies and Planning in 2002) began working in the EPA Brownfields Program just a year after its inception. Tucker has attended numerous ribbon cuttings for parks, schools and housing built on former brownfields. She gets a lot of satisfaction seeing derelict sites returned to use, especially when EPA grants are used to fund projects with tangible community benefit. For Tucker brownfields are a part of community development, so she trains her staff to begin dialogue with municipalities around broad

community priorities and plans, whether that includes ball fields, municipal buildings or downtown revitalization. Though she encourages grant applicants to use money on projects without market viability or in communities with great need, grant recipients have considerable discretion in the deployment of grant funds. According to Tucker the EPA brownfields program retains bipartisan support as an economic development program because of the discretion afforded local grant recipients on the use of federal funding, including projects fully eligible for market-rate financing. When Tucker began working at EPA New England the majority of assessment grants funded inventories; today less than half of assessment grants in New England support inventories because so many areas have used EPA funding to identify key sites and support master planning processes.

Tucker has distributed enough brownfield grants to know that a stand alone inventory is insufficient to spur development. For Tucker, brownfield inventories are about bringing together stakeholders to prioritize brownfields for redevelopment, “communicating a plan to the community,” and fitting brownfields into larger plans for growth or revitalization (Tucker 2007). She recommends that grant recipients use some of their first assessment grant to perform environmental assessments of priority sites and reprioritize if initial inquiries suggest severe contamination. Tucker’s strategies for making the most of EPA grants come from her considerable experience in a regional office with the second greatest number of grants delivered in the country. However, significant variation among EPA regional brownfield programs and the absence of centralized written guidance for inventory makers results in isolated experiments throughout the country as individual grant recipients struggle through the same challenges.



## **Kenton County Land Recycling Program**

Kenton County borders Ohio along Kentucky's northeastern edge. Around 150,000 residents make up the county, with most living in the more urban north (US Census 2000). The county, still coping with the challenges of vanished industry in its north, is increasingly becoming post-agricultural in its rural south. As in many American counties, housing subdivisions are cropping up on former farms while urban parcels lie dormant. The county seat of Covington sits across the Ohio River from Cincinnati and once shared in the industrial wealth of its neighbor city. Covington is the biggest city in the county, one with a downtown: "what you might call a *real city*" (Kent 2006). With no room to grow outward, the city began to take stock of economic expansion opportunities within its developed land.

### *Inventory Origins*

Somewhere in the process of searching for ways to increase the tax base, someone at the City of Covington got the idea to focus on brownfield redevelopment opportunities. An EPA grant funded the city's brownfield inventory, performed as a pilot project with the Northern Kentucky Area Planning Commission, which led to the redevelopment of some sites identified through the inventory. The city's satisfaction with the inventory convinced the county to undertake a brownfield inventory for the whole county, sponsored by the planning commission with technical support provided by Northern Kentucky University and Link-GIS, a geographic information system for Northern Kentucky. The planning commission staff member who originated the inventory has since retired, but Ryan Kent, a GIS specialist at the planning commission who presented

the Kenton County Land Recycling Program at the 2005 EPA Brownfields Conference, now maintains the database. Kent describes the inventory database as being designed to support decision making among public administrators by identifying properties with euphemistically termed “environmental conditions” and providing property details viewed as being useful for promoting their redevelopment (Kent 2005). Its intended users include planning commission staff and city officials, including administrators and mayors. Though technically the inventory is available to the public, who can request to view it on scheduled visits to the planning commission office, it is not web-accessible. Interested developers can gain access to the inventory by contacting planning commission staff (Kent 2006).

### *Populating the Inventory*

When the county began its inventory the project team decided to undertake a comprehensive inventory of county brownfields, recognizing they would have to go beyond the traditional government databases; informal or illegal dumps may never have been reported and long-abandoned factories that operated before the advent of chemical regulation may have been vacant so long that government knew nothing about them. The inventory sources included the old regulatory standards, including federal databases from the National Response Center, RCRA Corrective Action and Superfund. The Kentucky Solid Waste and Hazardous Waste lists provided open dumps and orphaned municipal solid waste landfills, while the Kentucky Underground Storage Tank Branch provided reports of corrective actions on leaking underground tanks. Then the inventory creators went a step beyond federal and state regulatory lists, including typical sources for pre-

acquisition due diligence such as Sanborn Fire Insurance Maps. To fill in the remaining gaps, the inventory creators turned to a variety of local sources including fire departments, mayors, town planning officials, economic development agencies, real estate professionals and neighborhood associations.

To elicit input from local sources, the inventory creators personally contacted organizations and local agencies. Contacts were told what types of sites the inventory creators were looking for: abandoned or vacant parcels with possible contamination, which may be suspected from the site's prior uses or visual cues such as manufacturing equipment, rusty drums, or above ground storage tanks (Kent 2006). Though the concept of a brownfield was new to some, others knew "right off the bat" what properties might be contaminated (Kent 2006). Looking back at the process, Kent says the information of some groups were more useful than others. Most of the reliable information came from city officials, firefighters and police, who usually had a pretty good idea of what sites might be contaminated. Local planning officials who had been in communities for years knew of long abandoned parcels. One employee who had worked with the planning commission since its inception provided a good number of sites through his personal contacts with community members. Local neighborhood associations were somewhat helpful but most often the parcels they reported turned out after further investigation to be nothing more than good, old-fashioned blight: "the property was run down, there was debris and the grass was too high" (Kent 2006).

The inventory team visited and photographed every parcel suggested by local sources and compared what they saw to what had been reported. They also ran background checks on the suggested sites to see if prior uses matched the contaminants

reported by local sources. The county did not have to deal with conflicting reports between individuals, but did sometimes uncover inconsistencies between the type of contamination suggested by local sources and past uses as documented in official records:

There were times when people thought a property was contaminated with something but it wasn't. We found out by checking the site history that the prior use wasn't consistent with the contamination they suggested. People really didn't have an idea what the site was contaminated with but thought it might have been something. (Kent 2006)

To substantiate contaminant claims from local sources, the inventory team checked Sanborn maps, title records, and other official sources of site history. When the two were inconsistent, the official records were given precedence. In some cases zoning administrators who regularly receive and investigate violation complaints gave the planning commission more information on suggested sites. Sites that passed the filter were aggregated into a "community-identified" data layer. Kent remembers there was some overlap between community-identified sites and regulatory lists, but mainly those properties were "pretty blatant" uses including manufacturing plants (Kent 2006). Though a document linking local sources to the properties they reported was retained somewhere in storage, the identifying information was not maintained in the database and that document linking individual sites to local sources is now probably "buried deep in a box" (Kent 2006). Out of 229 sites with "environmental history" identified in the countywide inventory, 23 were community identified (Kent 2006).

### *Inventory Content*

The inventory's linked map and database enables countywide context and quick access to parcel-specific information, but limits data mostly to physical attributes, site history and current ownership. The map data layers include aerial photographs from

1999, 2004 and Mylar from 1963, current zoning, roads, parcel and city boundaries, water and sewer infrastructure, drainage bodies including lakes and streams, hydrological and topographical contours, Census household information by block and tract (income, population, ethnicities, ages), a map of the county's five-year comprehensive plan containing suggested land uses, and locations of real estate development projects of interest such as condominiums (Kent 2006). The inventory database's site-specific information includes the source linking the parcel to the inventory (i.e. "National Response Center Site" or "Community-identified site"), regulatory status, site attributes that may complicate or facilitate redevelopment (such as parking lots), environmental response history, Sanborn maps, aerial photos and site photos collected in the course of inventory development. The database also provides space for indicating whether the site is considered to be a priority for redevelopment.

Prioritizing parcels for redevelopment falls to planning commission staff in collaboration with local administrators and inventory technical partners. The parcel ranking system grew from conversations with planning staff who identified important characteristics such as distance to transportation infrastructure. For example, if a parcel is within a half-mile of an arterial or railroad spur, it receives three points; within one mile, two points, and so on. The more points a site receives, the higher a priority for redevelopment on the three-tier scale of high priority-medium priority-low priority. While some local administrators were consulted during the development of priority attributes, residents' preferences were not elicited or incorporated (Kent 2006).

### *Liability*

When designing the countywide inventory the planning commission followed course with the City of Covington, which had decided not to provide web access to its inventory because of liability concerns. By restricting access to the inventory, the county hopes to avoid damage claims by property owners whose property has been “publicly classified” as a brownfield and allegedly decreased in value (Kent 2006). Keeping the inventory off the web reduces the likelihood of litigation though perhaps not the grounds, since the inventory is not strictly an internal document, being accessible to public viewing on appointment. In addition to access control, the inventory creators sought to avoid litigation by employing a general disclaimer, which states: “The sites listed in this inventory are not necessarily all brownfields. These sites do however have some sort of environmental history” (Kent 2005). The disclaimer was worded without legal counsel in an attempt to keep it “as general as possible” (Kent 2006).

### *Users*

With Kentucky’s brownfield program still in its infancy many property owners and municipalities have very little experience with successful redevelopment. The planning commission sees the inventory primarily as a tool for shifting perception from one of constraint to opportunity. City administrators “often don’t know what they can do with brownfields; they think they might be able to clean them up but it might not be worth the money, and they don’t want to get involved with a lot of it.” The inventory “is about getting them thinking of brownfields positively instead of just negatively” (Kent 2006). Though the inventory’s primary users are public administrators, some private

developers and environmental agency staff have visited the planning commission to view the inventory. No residents have requested appointments to view the inventory, perhaps because of a reliance on newsletters and emails from the planning commission to raise awareness. However, the inventory's low public visibility is consistent with the liability avoidance tactic of limiting public access.

### *Future*

Without grant funding to sustain the inventory beyond the startup phase, the county has had to concentrate resources on maintaining the original batch of parcels. Inputting new sites requires many hours of research, and the county does not have the manpower to dedicate to that task. Meanwhile, the state of Kentucky has identified Kenton County Land Recycling Project as a model as it develops its statewide brownfield inventory in compliance with federal mandate (Petitjean 2007). The state may decide to do online marketing for priority brownfields whose owners are interested in selling. But Herb Petitjean, the state brownfield coordinator expresses concern that the lack of brownfield redevelopment incentives and abundance of greenfields in Kentucky may have the unintended effect of driving developers away from the marketed properties. The state may try to make brownfields more competitive with greenfields by using its online inventory to help potential purchasers find as much public funding as possible.

The state brownfield program may take a few lessons from Kenton County about the level of responsibility the public should assume for priority brownfields in their zeal to market them. After conducting its inventory Kenton County acquired and remediated a few of the most important brownfields. While some of those remediated properties have

been purchased and redeveloped, one site highlighted in the inventory still eludes redevelopment. The Donaldson Art Sign parcel, a medium priority site in the inventory, was remediated with the help of an EPA grant but still has not found a new owner.

### **Renew Alabama: An Alabama Redevelopment Database**

World War II-era Birmingham was the center of southern industry and industry was at the center of Birmingham. Steel, coal and railroad infrastructure sprawled across the city. When these industries evacuated, they left a corroded cityscape more void than mass. Now as industry moves south to the Sun Belt, the once declining urban center of Alabama is gaining population. Downtown loft developments have lured mid- to upper-income professionals from the suburbs, bringing the once nearly-vacant city center a permanent population of 3,000. Booming condominium construction is projected to double that population in less than two years (Wilkerson 2007). Downtown development has pushed up property values in the urban ring surrounding the city center, land which once supported Birmingham's industry. Sites like Trinity Steel, a former steel mill adjacent the middle class African-American neighborhood of Titusville, are now attracting developers as highly sought as WalMart and Target. Local government is aggressively marketing sites like Trinity Steel to developers, forming intergovernmental entities with the exclusive purpose of brokering investment deals. In the case of Trinity Steel, the Jefferson County Economic and Industrial Development Authority purchased the site, completed site cleanup, conducted a charrette process, chose the desired end use, worked some design schemes and started marketing, all within twelve months (Wilkerson



2007). This tactic has proven so successful at garnering attention it actually has given the local government leverage to demand more than just on-site investment. When the board turned WalMart down because it wanted more mixed-use on the site, WalMart parried with what some call an irresistible proposal, offering to invest in infrastructure improvements and infill housing in the adjacent neighborhood. According to Bob Wilkerson, a board member of the development authority, attracting multinational corporations to the industrial wastes of Birmingham would have been “laughable” two years ago. But not every brownfield in Greater Birmingham can be midwived by its own intergovernmental board. To market the vast acreage of underused land a team of federal, state and local government agencies created the Renew Alabama database.

### *Inventory Origins*

After twenty-odd years in the banking business, Bob Wilkerson went back to school to study city design. With his master’s degree in landscape architecture from Auburn University, Wilkerson went to work at the Regional Planning Commission of Greater Birmingham (RPCGB), where he specialized in brownfield and greenspace master planning. Planning objectives at RPCGB include greenspace preservation—in recognition of the loss of important ecological systems—and the redevelopment of abandoned cores. In conversations with EPA Region 4, Wilkerson’s office realized that Greater Birmingham needed a catalogue of its brownfields to help regulatory agencies track contaminated sites. Wilkerson recognized the opportunity to create a tool for marketing land, something that would facilitate redevelopment rather than simply taking stock. Wilkerson crafted the Brownfields Task Force and Redevelopment Initiative

“around the language of economic development,” bringing in professionals including engineers, attorneys, realtors, developers, designers, public agency representatives and economic development specialists to collaboratively build the brownfield database. Originally a body of eight people, in four years the task force has grown to a “powerful network” of over 180 participants, though not all regulars. The task force is action-oriented, and therefore explicitly not an advisory committee (Wilkerson 2007). Wilkerson views partnerships among diverse players, including regulators, private-sector professionals, public sector governments and non-profits, academics and citizens, as the key to successful brownfield redevelopment.

The inventory is intended to facilitate site scouting by developers. From his experiences at multiple brownfields conferences, Wilkerson recognizes that “almost everybody there is in economic development or represents developers” (Wilkerson 2007). After a few conferences at which he represented the RPCGB, Wilkerson “started getting calls from folks in Las Vegas, New Jersey, New York, Miami, London looking for sites” (Wilkerson 2007). In the calls, developers would probe for the same types of information about available sites, such as proximity to infrastructure and parcel size. Many site scouts look to Birmingham in search of opportunities for industrial expansion, though some developers specialize in mixed-use developments and housing in the urban core. Recognizing the utility of the internet for reaching both domestic and international developers, the task force molded the web-accessible database to respond to developers with defined parameters and a familiarity with brownfield redevelopment.

Database development was funded by the EPA, with design and construction provided by the US Army Corps of Engineers of Mobile, Alabama. The structure itself is

based on the database the Corps used to assist with the Indian Ocean tsunami recovery, which enabled short turnaround. The task force determined site content of the beta version. When the Army Corps completed database construction, the task force called a public meeting to present what they considered to be a finished product. Response to public notice of the meeting was so “overwhelming,” the location had to be moved from the regional planning commission offices to the headquarters of the Alabama Power Company. Public feedback from that meeting resulted in substantial changes to the database, which the task force had viewed as already complete: “They came, we showed and they gave use a lot of food for thought, including the things they liked, the things they disliked, things they wanted included and those things they didn’t want in the database” (Wilkerson 2007). With feedback from the meeting, the task force formed a subcommittee charged with making recommendations for revision. Basic revisions responded to public recommendations to make the database more user-friendly, jettison the term “brownfields” from the database name, and create plug-in tabs for various forms of redevelopment information. Renaming the inventory as the *Renew Alabama Redevelopment Database* was one of several redesigns aimed at making the website “more subtle” for those developers outside the brownfield redevelopment niche (Wilkerson 2007). The term “brownfields” has not been shed entirely, though; both the regional planning commission and Army Corps of Engineers inventory web links read *Alabama GIS Brownfields Database*.

### *Populating the Inventory*

In agreeing to fund database development, the EPA negotiated a directorial role in determining the types of sites that would be inventoried. The Brownfields Project Manager of EPA Region 4 decided to limit the database to sites that had received any form of public funds, information that was already in the public domain and did not require the consent of property owners. The regional EPA office worked with the Alabama Department of Environmental Management (ADEM) to aggregate information on land parcels which had received federal or state funding for environmental assessments or similar actions. The entire population of publicly-funded sites went into the database without filtering for size, zoning, or other site attributes. In the hopes of capturing more visitors to the website, the task force decided to include greyfields (abandoned shopping centers or buildings without suspected contamination) and infill parcels, and may eventually use the website to market greenfields.

Although the database includes only those properties which have received some public funding, the regional planning commission did conduct its own informal brownfield inventory, which met with extremely limited success. In a seven-county survey, the planning commission sent a letter “to every county commission, city government, chamber of commerce, industrial development board, large-land holding company including US Steel and Alabama Power, who they know have shuttered properties but have not been officially identified” (Wilkerson 2007). While the commission received notice of about sixty sites from municipalities, no response came from any of the companies contacted. The properties which were identified through the survey—mostly properties owned by municipalities, such as landfills—were brownfields

the planning commission knew about already. At a meeting about the study, a county commissioner said he wouldn't answer the letter that had been sent because "it scared him to death and felt like an invasion of privacy" (Wilkerson 2007). Brownfields inspire fear and privacy protection in private and public owners alike.

Eventually the task force hopes to implement a voluntary participation process modeled on the *New Jersey Site Mart*. Fran Hoffman, one of the creators of New Jersey's inventory, advised Bob Wilkerson as the task force engineered the *Renew Alabama* database. Wilkerson views voluntary participation as a way of creating incentives rather than as a means of avoiding lawsuits. In Alabama,

property owners are under tremendous misperceptions about the way regulatory agencies will treat them if they own a brownfield, so they basically have shuttered these properties and found the legal and accounting loopholes to make it legal. Owners of these properties would like to get rid of these properties but don't want to call it brownfields. (Wilkerson 2007)

In a voluntary participation framework, the property owner is given the opportunity to accept or refuse the opportunity to have his parcel of land included in the inventory, with no repercussions for refusal. By creating a forum for voluntary participation, the task force hopes to recast the relationship between government and private land owners as one of cooperation rather than enmity, and to thereby unravel the practices of regulators, municipalities and property owners that obstruct redevelopment. The task force has not yet implemented the voluntary structure, which has limited the cache of inventoried sites. Eventually the task force wants to implement a site nomination system like that used on the New Jersey Site Mart so anyone can nominate a property for consideration. But changing administrative authority for the inventory may delay the implementation of the voluntary participation framework and site nomination tool.

Currently the Greater Birmingham inventory is not enabled to receive site nominations for potentially contaminated sites and does not present potentially contaminated sites that have not received public funding. Though Wilkerson views citizens as an important component of the partnerships essential to brownfield redevelopment, getting average citizens to participate in the *Renew Alabama* database has proven only marginally successful. “In pragmatic terms,” says Wilkerson, “the database is probably most appealing to city leaders and governments who know where sites are because they’re typically blighted and not generating income.” Though the task force wants to “employ citizens to help us build the database,” the planning commission, the primary agency involved in recruitment for the task force, did not take “the time to identify and step forward to make a concerted effort to get neighborhood organizations in the task force” (Wilkerson 2007). An attempt to engage neighborhood associations in a task force meeting by inviting “a hundred some-odd neighborhood associations” by letter generated response by only about four or five. Along with limited recruitment efforts, part of the low participation may be explained by the perceived relevance: “Until there is a site identified in an organization’s neighborhood they will not just start coming to task force meetings” (Wilkerson 2007). But, Wilkerson added, once redevelopment activity for a neighborhood brownfield gains steam the planning commission does try to encourage involvement of neighborhood associations and local community development corporations.

Wilkerson cites public participation as a key determining factor for public funding allocation in brownfield redevelopment. For Wilkerson a key part of public engagement is creating dialogue with private property owners:

If I'm encouraging a community to do a grant application for the EPA, I tell them they need to establish public dialogue and document it. They need to call a couple of public meetings. On a recent project the city called one meeting in September and one in October. It's a small city but they identified property owners of potential brownfields and personally invited them to the public meeting. When they presented their plan to apply for a petroleum grant, they had people with vested interest and evoked intelligent discussion. The regional newspaper captured that and it became a valuable piece of marketing and communication. The EPA likes to see evidence of public engagement. When you turn in a grant application, and say what your outcomes of redevelopment might be, they want to know if people have weighed in and if you've had public meetings. (Wilkerson 2007)

Certainly private property owners are part of the public and have very-well defined stakeholder interest in brownfield redevelopment policy. The task force is not a decision-making body for permitting brownfield redevelopment, nor is its mission one of arbitrating land use disputes. The task force facilitates brownfield redevelopment by enabling dialogue among various and sometimes historically antagonistic actors both within task force meetings and in the forum provided by the database. However, through participant recruitment and database design, the task force influences who participates and what ideas are transmitted in that dialogue.

### *Inventory Content*

The US Army Corps of Engineers maintains the inventory content in conjunction with EPA Region 4; edits suggested by the task force must be forwarded to one of these two agencies for approval and entry. Site information on the *Renew Alabama Redevelopment Database* is fairly extensive, including GIS mapping layers providing limited site context. Many of the parcels in the database are accompanied by photos of current site conditions and a site history narrative, including operations and potential contaminants. Available environmental assessments are included in individual portfolios,

outlining the contaminants known to be on site, the distribution of contamination, and a description of any cleanup activity to date. Some sites also contain written descriptions of potential end uses, such as the Vulcan Rivet and Bolt file, which describes work between the City of Tarrant and Auburn University to develop a reuse plan including a transportation drop-off, open-air market, shops and green space, and remediating plant species including poplars.

Through his design training Wilkerson has learned the power of images. Though currently the database does not provide room for visual renderings from design charrettes, Wilkerson believes that would be “another vital and attractive potential for voluntary sites database, because images have the power to attract and sell pieces of property” (Wilkerson 2007). A design charrette for the Tarrant Vulcan Rivet and Bolt project organized by the design firm at which Wilkerson currently is employed had a strong influence on the firm’s receipt of cleanup funds and \$300,000 from the Brownfields Revolving Loan Fund of ADEM (Wilkerson 2007). In addition to making projects more competitive for public funding, charrettes “show the community the possibilities of redevelopment and what city leaders are thinking about to get citizens excited or get them to show their own visions” (Wilkerson 2007).

### *Liability*

Though the task force did not dig into legal case studies to characterize the risks associated with the database, inklings of liability shaped the database structure and content. Wilkerson acknowledges that there is “horrendous liability” in the notion of mistakenly identifying someone’s property as a brownfield (Wilkerson 2007).



Furthermore, outing brownfields is inconsistent with the mission of the database: to enlighten municipalities and property owners to the opportunities provided by brownfields. Liability avoidance shaped the initial decision to include only those parcels having received public funding, and makes the framework of voluntary participation very attractive to the task force. But it would be inaccurate to say that the decisions made were strictly a matter of litigation avoidance. Mediated through a multidisciplinary task force and directed by a designer with private-sector background, the database is explicitly a tool for recasting the punitive dynamics between regulators and brownfield owners. The voluntary participation model the task force hopes to emulate is about offering services and resources rather than mandating participation, extending a friendly hand to brownfield owners and demonstrating the potential for productive and beneficial collaboration:

That's how they did it in New Jersey. They compiled a list of sites thought to be brownfields, sent a friendly letter to the owner to say, "You might be a brownfield, if you think you might be, we'd like to include you in our Site Mart." Then they follow up personally, one property at a time. That's how movements get started and if people have successful, profitable deals, the word gets passed around and the thing gets a momentum of its own. (Wilkerson 2007)

### *Future*

The task force counts among its successes raising the profile of brownfields among chambers of commerce and other local decision makers, and thereby "precipitating projects that would not have come to fruition" (Wilkerson 2007). But its hopes to expand the inventory by implementing voluntary participation and introducing a site nomination tool may be frustrated by impending administrative changes. Though the regional planning commission originally was slated to assume responsibility for database maintenance, personality conflicts led the EPA to broker the deal with the Alabama

Department of Environmental Management. Putting the database under ADEM's guardianship contradicts the tacit mission of the database: to disentangle the notion of brownfields from the "authoritative control" wielded by the regulatory agency (Wilkerson 2007). As long as the database is attached to ADEM, property owners will never voluntarily register their land as a brownfield, argues Wilkerson. This has as much to do with financial disincentives as fear of regulatory censure. The cost of applying to the Alabama voluntary cleanup program is upward of \$15,000, compared to \$1,500-2,000 for a comparable program in Georgia. Application in Alabama does not assure admission to the program. Chronically underfunded and understaffed, Wilkerson argues that ADEM is hard-pressed to fulfill its present missions, let alone take on the inventory. Even if ADEM were able to recruit voluntary brownfields, without a regulatory mechanism to purge undeveloped sites from the inventory, ADEM may be in the position of tracking a growing number of brownfields in perpetuity. Therefore not only may property owners be loath to nominate their sites to the inventory, but ADEM has a disincentive for adding to its current catalogue of brownfields. Perceiving the inventory to be at risk, the regional planning commission may opt to build a "cloned database": a duplicate copy administered by a different organization capable of managing voluntary sites (Wilkerson 2007).

### **New Jersey Site Mart**

New Jersey's central location between Boston and Washington, D.C. fuels high property values and secures a solid economy, with residents receiving some of the highest

incomes in the country (Bureau of Economic Analysis 2007). Though industrial economies along the eastern seaboard have shrunk considerably, the state's ports continue to play a vital role in national trade and it remains one of the national hubs of the pharmaceutical and cosmetic industries. But despite its booming economy and high standard of living, New Jersey has not shaken its reputation as the poster child for industrial waste.

### *Inventory Origins*

The New Jersey Site Remediation Act of 1998, which created the Governor's Brownfields Redevelopment Task Force to operate independently of the New Jersey Department of Environmental Protection. The brownfields task force—composed of public and private sector actors—was charged with providing policy recommendations to the legislature and state government offices and specifically tasked with creating a brownfield inventory for the state. The inventory emerged through the efforts of two uniquely qualified, if somewhat unlikely champions.

Lori Sheppard had a history in municipal politics, including time served as mayor. In 1997 when she came to work at New Jersey's newly formed Redevelopment Authority, Sheppard received a call from the state's Department of Community Affairs inviting the Redevelopment Authority to participate in the New Jersey Brownfields Redevelopment Interagency Team (BRIT). Sheppard had never heard of brownfields, along with many people in her office, but "drew the short straw," becoming the agency representative (Sheppard 2007).

When she came to the New Jersey Department of Community Affairs Office of Smart Growth, Dr. Fran Hoffman was skeptical of brownfield inventories. Before coming to work for the state, she had worked with the EPA to assess the agency's 300 pilot brownfield grants, "to find out what was working, what wasn't, to network and provide supportive resources" (Hoffman 2007). Many of the grant recipients had spent the \$200,000 they received on local brownfield inventories. In her conversations with these grant recipients, Hoffman found that generally they targeted areas perceived as being important for redevelopment in the city at large rather than taking stock of all brownfields in the city. A town in Connecticut "that went to extremes" worked with the Weston Consulting Company to develop a software package that would rank different brownfields to assess which sites were more likely to be ready for redevelopment, on which public efforts would be focused. At the end of the two years of development and \$200,000, the municipality felt that what they knew from the gut was more reliable and a lot cheaper than what they had gained from the inventory. Despite being skeptical of costly, time-consuming inventories, Hoffman eventually concluded that a brownfield inventory for New Jersey was worth the effort. New Jersey was "so close to being built out" and open space preservation was so strong, economic growth necessitated brownfield redevelopment. The state's smart growth policies created strong incentives for developers to work on already-developed land. Elected officials wanted higher visibility for brownfield incentive programs, and developers wanted more information on incentives. The combined forces of public and private demand drove the inventory forward (Hoffman 2007).

After passage of the state brownfields act, the task force spent the first couple of years figuring out what information would be needed, “a long, arduous process with discussion after discussion” (Sheppard 2007). The task force consulted at length with private sector specialists including real estate developers who helped the task force sift the “really essential information” from the “unnecessary” (Hoffman 2007). The Brownfields Site Mart home page bills itself as making “it easier for developers to locate and build on land in cities and towns,” advertising “State & Local Incentives : Liability Relief : Streamlined Process : A Better Bottom Line.” But an equally important purpose of the Site Mart is to facilitate information sharing between local municipalities and the state.

### *Populating the Inventory*

The task force had been charged with compiling an inventory of brownfields, but had no idea what type of brownfields to inventory or how to gather relevant information. The task force began by looking to existing inventory efforts within the state. The New Jersey Institute of Technology had been documenting former industrial sites within the state’s ports, funded by the New Jersey Transportation Planning Authority and with assistance from the Department of Transportation. Growth around the ports was booming and the state wanted to understand the number of underutilized sites, the extent of contamination and what would be needed to promote warehouse development. The information incorporated into the port inventory was insufficient for the statewide inventory, and the task force realized it needed to dig deeper and broader to meet its agenda (Sheppard 2007). Next the task force consulted the Department of Environmental

Protection database of contamination events, a comprehensive list of all spills and releases that had been reported to DEP. The DEP database included active businesses and residences, land uses beyond the brownfields rubric defined by the state, which was limited to abandoned or underutilized commercial and industrial properties. To narrow the DEP list, the task force realized it would need to employ the efforts and knowledge of municipalities (Sheppard 2007). At this point, licensing and customizing software for the brownfield database had already cost the state \$100,000 (Sheppard 2007). After a six-month hiatus during state elections, and with money from the EPA, the state hired new staff to work personally with local economic development directors and other local contacts to populate the database (Hoffman 2007).

In 2002 when Fran Hoffman joined the Department of Community Affairs Office of Smart Growth, the inventory project was already straining under tensions between municipalities and the state staffers soliciting participation. Hoffman says: “some of the state staffers contacted municipalities and demanded participation, and you never get anywhere doing that. It’s a hard sell anyway and local governments don’t appreciate being told what to do” (Hoffman 2007). Hoffman waited to pursue the inventory for a while, “to let feelings lie and figure out if it was really needed, if it made sense to expend so much energy on it” (Hoffman 2007). After a few months, outreach staff started visiting municipalities armed with 3.5” floppies of the DEP database, working one-on-one with local staff to compare DEP-listed sites with local records to weed out active businesses and other uses beyond the brownfields definition (Sheppard 2007).

The handful of state staff members deployed to ground truth the DEP database struggled with the workload, not only because of the sheer number of properties needing

cross-checking but the investment needed to generate and sustain interactions with municipalities. Of 560 letters requesting municipal contacts for the brownfield database, five mayors responded. Even when state staff were connected with local contacts and spent hours introducing them to the database, municipal staff—deluged with their own workload—renewed on commitments to complete database cross-checks. Attempts to compile EPA-funded local inventories into the state inventory met with limited success since many of those inventories were already out of date (Sheppard 2007). Eventually the task force struck upon a more successful method of populating the inventory, creating the County Municipal Academic Partnership, which pairs municipalities with academic institutions to gather and import local information into the brownfield database (Sheppard 2007). This system provided the much-needed manpower driven by hard-and-fast semester deadlines. When the grant money ran out and the task force could no longer keep staff hired to build the inventory, CMAP provided the labor to keep the inventory going, cross-checking and entering one thousand sites in a single summer (Hoffman 2007; Sheppard 2007).

Community organizations have collaborated with some municipalities to populate the New Jersey inventory, but collaboration is constrained (at least in part) by the limited resources available to nonprofits. Housing and Neighborhood Development Services, Inc. (HANDS) assisted the city of Orange with the inventory after having partnered on a brownfield pilot project. Students from Montclair College inventorying brownfields for the city of Orange had mistakenly identified a photographed building as being on an adjacent brownfield; the director of HANDS caught the error and notified the site administrator (Sheppard 2007). Though Sheppard suggests that community organizations

engaged in real estate development “add to the richness of inventories” by notifying municipalities of preliminary site assessments they have performed as part of pre-acquisition due diligence, or by informing the municipality of former uses that might not be captured in documentation—“if a munitions factory was actually an old shoe factory”—these organizations were rarely tapped in the Site Mart inventory (Sheppard 2007). Sheppard cites capacity limitations and resource shortages as primary concerns for involving community organizations. Like other public actors, nonprofits have an easier time finding program money than administrative funding, which limits the amount of effort they can invest in projects peripheral to their core missions (Sheppard 2007).

Technically the design of the New Jersey Site Mart enables participation by any interested party. Any visitor to the Site Mart may nominate a site to be considered for entry into the inventory; the user must only register a name and password by providing contact information and affiliation as a Municipal Reviewer, State Reviewer or Guest. The nomination form requests information on the property owner, site history (prior and current uses), condition of existing buildings, site photographs, proximity to utilities, infrastructure and protected or sensitive ecological areas, environmental history (contaminant releases, environmental assessments or litigation), municipal contacts, property value, inclusion in a zone that might confer financial incentives (Main Street, Environmental Opportunity Zone, Brownfields Development Area, Urban Empowerment Zone, etc.), and the status of any predevelopment studies performed (market research, traffic studies). The form also provides space for a Site Description, with explicit emphasis on its importance:

If more space is needed for Site description, please attach separate sheet. Please keep in mind the importance of the description. This is the first thing a Site Mart



visitor will see. It needs to be the “hook” that will grab someone’s attention and encourage them to look at the details of the site.

Municipal contacts or student interns perform a background check on every nominated site to verify it as a “brownfield” under the state definition and cross-check submitted information with the property owner as well as environmental, tax and zoning records. The site nomination function of the Site Mart website was developed for two primary functions: to encourage property owners to register their abandoned or underutilized commercial or industrial properties with the state, and to facilitate information sharing between local municipalities and the state. Although technically anyone can nominate a site to be considered for the inventory, the majority of nominated sites come from municipalities updating records with the state. Recent edits to the site nomination tool emphasize the utility of the site nomination tool as a means of synchronizing information between government agencies. In order to limit redundant paperwork, New Jersey’s site mart nomination tool was recently modified to include information required in reporting to the EPA Assessment Cleanup and Redevelopment Exchange System (ACRES), designed to track the progress of EPA Brownfields grant recipients (Sheppard 2007).

Though the inventory was mandated and developed by the state, municipal management can make or break it. An automatic tracking system requests status updates from municipalities every ninety days for files that have not been edited within that time; if the municipal contact does not respond the file is “thrown into the delete pile” (Sheppard 2007). At one point the inventory had to be shut down because so many files were at risk of deletion.

## *Inventory Content*

The Site Mart is a sequel database built on a content management system called a “dynamic site framework” (Sheppard 2007). Guests to the website see only the “front” end of the database, which currently has less than one hundred sites. Registered municipal and state users have access to both the front and back ends of the database and can search all categories including incomplete files, those pending redevelopment and those already redeveloped (Miller 2007; Sheppard 2007). Individual files contain the information requested in the site nomination form. Though the file indicates whether or not an environmental assessment has been conducted, the results of any environmental inquiry is conspicuously absent from the website. The database organizes information into a brownfields dossier searchable by geography rather than a brownfields map. For each brownfield, the database contains a clear and concise written description with a few accompanying pictures. Though the website provides a link to the DEP brownfield map, that map provides more graphic context in terms of ecological biomes than urban zones.

There is no dedicated space for suggested end uses, either in the nomination form or the database structure, though municipalities sometimes use the additional memo field to include a description of potential reuse, such as “6 acre former shoe factory in area in need of redevelopment; suitable for redevelopment as housing” (Sheppard 2007).

Sometimes end uses may be suggested through other fields such as zoning (Sheppard 2007), though often—and especially in areas in need of redevelopment—the desired outcome is to change the land use (Hoffman 2007). Though it is up to the municipality to determine the suitability of recommending end uses, Hoffman cautions that suggestions might have the unintended effect of limiting development possibilities if the property

owner or municipality has not given ample and creative thought to what could go there. Hoffman suggests that instead of suggesting end uses, a municipality may want to issue a Request for Proposals (RFP) to see what developers suggest. The extra legwork required to provide meaningful suggestions for end use also may delay listing a brownfield on the inventory (Hoffman 2007).

The interagency team attempts to make clear to developers, especially those who have limited experience in New Jersey, that municipalities regularly exercise their power to restrict land use, particularly in areas in need of redevelopment (Hoffman 2007).

Tracking tools on the inventory website indicate that the majority of developers using the inventory are based outside of New Jersey, mainly in California, Virginia, Pennsylvania and New York (Sheppard 2007). This is why the database was designed to direct interested parties to the municipality directly rather than one of many state-level agencies with decision-making power in brownfield redevelopment, explains Hoffman: municipalities know the state resources available for particular projects and in many cases have to approve redevelopment plans. The task force wanted interested developers to contact the municipality as soon as possible, often directing developers who called the state to look at the Site Mart and get an idea of what sites are out there. Says Hoffman:

You have to get out and talk to people in counties and municipalities, the people you'll have to relate to anyway and who you'll have to get to know on their turf. They will lead you to properties where they will be likely to permit redevelopment because those permits are as important if not more than state approval.

The interagency team encourages developers to conduct visioning charrettes “to give opportunity for consensus to be developed and real solid buy-in from all members”

(Hoffman 2007). Essentially the database is perceived as a jumping-off point for collaborative redevelopment.

Alan Miller, Brownfields Program Manager at the Brownfields Redevelopment InterAgency Team and current Site Mart coordinator, views the inventory as being handicapped by a lack of relevant information on the likelihood of redevelopment. Sites on the public portion of the database are identified as “Available for Redevelopment.” But that designation does not necessarily mean that the parcel is on the market: “We can do windshield surveys, do tax surveys, but we don’t know whether it’s a priority for the municipality, or whether the owner wants to redevelop.” Although the Site Mart tells you there are many brownfields in the state, it “doesn’t tell you what buy-in there is in the municipality” for redevelopment of that particular site (Miller 2007).

### *Liability*

During development of the state brownfield inventory a lawsuit was filed against the New Jersey Department of Transportation related to a list created by the agency of contaminated properties—properties which turned out to not be contaminated. The lawsuit created “instant paranoia” on the task force (Hoffman 2007). A small municipality in southern New Jersey also was threatened with a lawsuit by property owners who learned about the inventory. The thorough brownfield list generated by the city has never been forwarded to the task force (Hoffman 2007).

In response to potential liability, the task force created a multilayered process for reviewing site nominations. When a site is nominated, the database sends an email to the municipal contact who reviews the nomination and determines whether the site fits the

state brownfield definition and whether the information agrees with local records. If the municipal contact rejects the nominated site, she explains why. Whether the nomination is accepted or rejected, the municipal contact forwards the nomination to the DEP to review and compare with departmental records. The outcome of both reviews is then sent to the Site Mart administrator who reviews the comments and confers a status on the nominated site: available for redevelopment, pending redevelopment, incomplete, etc. Sites available for redevelopment are posted on the “front end” of the database, where they can be reviewed by anyone; those pending redevelopment or with incomplete information are held on the “back end” of the database until the status changes. By requiring three reviewers, the task force hopes to mitigate personal agendas, and ensure that properties are not illegitimately identified as brownfields (Sheppard 2007).

Before a property can be listed on the public portion of the database, the property owner must sign a waiver (Sheppard 2007; Miller 2007). Only recently the task force had decided—upon consultation with the state attorney general and extensive case law review—that since the law did not require the state to gain permission from property owners to make files public, incomplete files or those without waivers could be posted on the public portion of the database. The newly-elected governor has since directed the interagency team “to take it more slowly than that” (Miller 2007). To flesh out the public portion of the database, which currently only has 88 sites, the team has decided to import sites from the “back end” of the database that are cross-listed on the DEP list of known contamination, itself a public database. That cross-linking will bring the “front end” of the database to 530 sites. Even though contamination of those parcels is already public knowledge through another state agency, property owners will be notified by letter and

have thirty days to decline and provide reasonable supporting arguments (Miller 2007). The interagency team hopes to include even more sites on the public portion of the database by cross-linking the protected portion with lists of sites that have documented environmental assessments stemming from property transfer or pre-acquisition due diligence. That will add an additional 240 sites, bringing the public population of the database to around eight hundred (Miller 2007).

### *Future*

Though only 88 properties are on the public portion of the inventory, the site administrator reports that 130 inventoried brownfields have been redeveloped. Those redeveloped properties are listed on the back end of the inventory but will eventually be moved to the public portion of the database as “success stories” (Miller 2007).

Assumedly those properties were either redeveloped as a result of developers being funneled to municipalities by expressing interest in a different parcel listed on the public end of the database or were redeveloped separately from the inventory. Since those redeveloped sites were never on the public portion of the inventory it seems that the primary role of the Site Mart may be as an impetus for municipalities to prioritize parcels for redevelopment. The state has not yet reviewed the redevelopment of parcels listed on the public portion of the inventory (Miller 2007; Sheppard 2007). The study may have to wait a few years, since brownfield redevelopment can take a good amount of time from identification to construction completion (Miller 2007; Sheppard 2007).

The New Jersey Site Mart changes substantially as state administrations and interagency staff members come and go (Hoffman 2007; Sheppard 2007). As powerful a

force as liability avoidance is, the inventory's greatest challenge may be overcoming political resistance to the negative label of brownfield. The environmental commission of Garfield, New Jersey created a comprehensive brownfield list by combining the Department of Community Affairs list with a windshield survey. What began as a large pool of sites ended as a short list after generous editing by the mayor, who "said he did not want his city to be labeled the brownfield capital of New Jersey" (Hoffman 2007).





## **The Shift from Inventories to Plans: Analysis and Recommendations**

The inventory makers I interviewed worked with limited guidance and resources, creating inventories out of individual tenacity. They faced many of the same challenges, negotiating liability, political cold feet, and complex tensions between private property rights and public will. My analysis and recommendations are crafted with the aim of sharing lessons learned by these inventory makers with other local governments struggling to define brownfield redevelopment agendas and with the state and federal grant makers who provide guidance to these local governments.

### **Inventory Lessons**

Land recycling, renewal, commerce. These proxy concepts supplant the term brownfield in each of the inventories, which are carefully scripted to cultivate a new perception of brownfields among developers, property owners, municipalities and the public at large as opportunities for economic growth and community development. But while the term brownfield is scrupulously avoided it does linger, either to harmonize with existing government programs that govern or facilitate redevelopment or to enable internet searches by the faraway developers these inventories are meant to attract.

### *Attracting Development*

While inventory makers in Alabama and New Jersey recounted experiences of developers seeking real estate deals, it is not at all clear that developers use web-accessible inventories to identify properties. Susan Hollingshead is the founder and managing principal of Renova Partners, a California-based development firm specializing

in environmentally-impaired properties. Typically Renova's clients are corporations seeking to divest properties while managing environmental liability. Though Renova develops brownfields all over the country, the majority of its projects have been in the East or West Coast where property values are high enough to support privately-financed redevelopment. According to Hollingshead, Renova rarely uses online inventories since they tend to focus on properties that are either too small or require public-private partnerships because the land value is too low to justify the cost of remediation. Hollingshead could not recall any Renova projects found through an online inventory and speculates that many inventoried properties are more likely to be redeveloped by "conventional developers from the area with close relationships with the redevelopment agency" (Hollingshead 2007). Indeed it seems that while developers may scan online inventories, they do not seem to provide any added value in terms of their success in funneling developers to municipalities. Various accounts suggest that developers find municipalities independent of inventories by contacting staff at EPA regional offices, state redevelopment authorities and regional economic development agencies, who direct them to municipalities matching their expressed interests. Therefore a municipality should know not just where its brownfields are, their sizes and proximity to infrastructure but be able to communicate a coherent redevelopment strategy to local developers and regional and state agencies with higher visibility to outside developers. Instead of looking at inventories as a marketing tool in themselves, they should be perceived as a deliberative process of crafting a brownfield redevelopment plan so that municipalities can actively pursue investment, locally and, where appropriate, nationally.

Inventories have had indeterminate success in catalyzing private sector

brownfield redevelopment. The Donaldson Sign Art property prioritized in the Kenton County Land Recycling Project has not been redeveloped despite expenditure of public funds on its cleanup; as a medium priority site, it is not clear why it was selected to receive public funding in the preliminary rounds. In New Jersey the majority of redeveloped properties were not listed on the public portion of the inventory, calling into question the purpose of the controversial public website and obscuring the role played by the inventory or municipal governments in spurring that redevelopment. Trinity Steel—a property never inventoried in the Renew Alabama database—attracted competitive bids from multiple corporations and has received more public attention than any inventoried brownfield. Though it may be too soon to account for the utility of brownfield inventories for facilitating site redevelopment, none of the inventories appear to have structured measurement tools into the databases themselves. Properties expunged from the database may not be captured in future analyses, and the resources invested to gather information on those lost sites will be concealed. Brownfields counted as redeveloped may or may not have been redeveloped as a result of the inventory, and may only reflect market dynamics free of public intervention.

### *Planning for Brownfield Redevelopment*

The inventories were established to help public officials understand the brownfield terrain in a given place by providing basic descriptions of sites—how many there are, what they look like, where they are—essential information for developing anything other than a piecemeal approach to distributing public funds for their redevelopment. But the inventories had limited success at creating a concept of

brownfield stock that supported strategic decision making. Because the sample inventories were designed to spur private redevelopment they tended to focus on the physical attributes of individual brownfields—size, condition of current buildings, prior uses, results of preliminary environmental assessments—with hardly any contextual information on the demographics and land uses of the surrounding area. The size and proximity to infrastructure of a brownfield tell public officials very little about the way redevelopment of that brownfield will shape surrounding areas or how that property fits into larger plans for the area. Brownfields should be prioritized not based on the general characteristics important to developers but on the centrality of that brownfield to neighborhood, city or regional plans for future development. For example, inventory makers should consider the impairment of the surrounding neighborhood and the relative importance of a particular brownfield to its redevelopment. Rather than waiting for the developer to suggest the end use the inventory process should be exploited for the opportunity to deliberate over many possible end uses and identify the most preferred alternatives. In short, for inventories to be meaningful they must be integrated into land use and development planning exercises.

Incorporating brownfield inventories into larger plans not only ensures that redevelopment of individual brownfields supports citywide goals, it also improves the likelihood that municipal agencies will continue to support the inventory because it is explicitly linked to their own agendas. Soliciting and sustaining participation among municipalities was one of the biggest challenges faced by the New Jersey and Kentucky inventory staff because brownfields were not perceived as a central concern at the municipal level. Municipal staff resisted assisting regional or state agencies in performing

property background checks and maintaining files on inventoried properties in part because they did not have the funding or mandate to participate. To compensate, the agencies in Kentucky and New Jersey used state and EPA funding to hire staff dedicated to populating and maintaining the inventories, only to realize they did not have the funding to retain those staff once the EPA grant expired. Like any other public initiative, the official organizational structure underlying the inventories belies the centrality of a few champions willing to weather political tides and funding droughts. Legislative mandates and regulatory requirements may lend an inventory an air of structural longevity, but the departure of a dynamic individual can leave it to atrophy. Municipal governments are essential to populating and maintaining inventories because they have better knowledge of historical land uses, tax records, real estate activity and community priorities and struggles. Tying brownfield inventories into municipal or regional planning may not resolve staffing shortages since property background checks are inherently resource intensive. But it will help realize the true purpose of inventories—to prepare local governments to guide development—and potentially inspire greater cooperation between municipalities and the agencies undertaking brownfield inventories.

The flexibility of EPA assessment grants allows for an inventory to be constructed any way the grant recipient chooses, including planning processes with a focus on brownfields. In Alabama and New Jersey much of the funding supported database construction, leaving little left over for populating the database. Rather than spending \$200,000 on a sophisticated database, grant recipients may instead direct this money toward planning processes incorporating brownfields as a focus area. If the purpose of the inventory is to spur a few projects demonstrating the benefits of redeveloping

contaminated land it is not necessary to design a comprehensive inventory. Inventory funding may be best spent on a pilot project in a given geographic area or on identifying properties best suited to a particular reuse such as pocket parks. Unless the locality awarded the grant is exceptionally small or municipalities invest their own resources, attempting to create a comprehensive inventory in the three year life span of an EPA grant is unlikely to provide a well-defined strategy supporting anything other than isolated successes.

### *Planning for Realistic Redevelopment*

Regional economics and local demographics influence the kind of brownfield redevelopment that can be accomplished. Priority site characteristics should reflect the realities of the regional economy and local goals for growth. Low property values and a suppressed economy are unlikely to support the profit margins demanded by corporate real estate scouts and large developers. The economic resurgence in Sun Belt states like Alabama is not likely to be shared soon by the Steel Belt states of Ohio and Michigan; priorities for brownfield redevelopment should acknowledge those constraints. For traditional land uses brownfields cannot compete with undeveloped land unless growth restrictions increase the cost of developing previously undeveloped land or brownfields have a locational advantage to populations or services. If neither of those factors is true in a given place, it does not make sense to prioritize large parcels for traditional industrial or commercial development. Instead industrial sites may be reclaimed to fuel a new economy, as exemplified by the brownfield-to-brightfield project in Brockton,

Massachusetts in which a brownfield was redeveloped as the nation's largest photovoltaic array with funding from a variety of state and federal agencies (Morey 2007).

Many brownfields will not be marketable without public support because the economic circumstances that created them are still in play. A strategic inventory can realize multiple opportunities for productive reuse of contaminated land. Brownfield redevelopment can put delinquent properties back on the tax rolls and create employment. But even brownfields with little potential for creating cash flow or jobs can become great assets that leverage additional investment and make a municipality more competitive in attracting new residents and businesses. Neighborhood parks create more competitive housing markets. Health centers provide needed health care and stabilize desperate neighborhoods. Community centers provide adaptable space for youth and senior activities and cultural events. The final priority properties should be those most likely to facilitate development in the surrounding area and create a cascade of investment. The value and importance of a property does not necessarily correlate to size or marketability but may have more to do with proximity to struggling commercial corridors or potential to provide critical services to underserved populations. Realizing the true value of underused land means returning land to use for the benefit of its neighbors. Creating whole places is not something that can be done through the market alone or even through comprehensive planning by those in power, but requires community-wide participation.

### *Involving Communities*

Though communities should play an essential role in inventories from conception to application, the relationship between inventory makers and communities is convoluted by liability, politics and biases about reliable or useful knowledge. The shape that an inventory takes depends on the priorities and past experiences of the individuals directing it as much as the priorities of the mandating body. In the case of the Renew Alabama Redevelopment Database, Bob Wilkerson's dual background in finance and design led him to recruit task force participants with experience in finance, development, construction, engineering and design. In New Jersey, Lori Sheppard's experiences as a mayor told her that the inventory would be most successful by connecting developers with municipalities from step one. The planning commission staff member who designed the Kenton County Land Recycling inventory, a long-time county planner, sought out neighborhood associations and other community members to flesh out the regulatory lists of contaminant releases. The previous experiences of an inventory administrator enable resilience and creativity but also can constrain the social networks she perceives as legitimate or reliable resources.

The Kenton County Land Recycling Program staff solicited participation from neighborhood associations and public safety personnel to identify brownfields eluding regulatory databases. Of the three inventories studied, Kenton County had the highest level of community participation built into the inventory process. However the information gathered through community participation was limited to identifying potentially contaminated properties and gathering anecdotal property histories; prioritizing properties for redevelopment remained the purview of the planning staff and



end uses were market driven. When performing property history reviews, official documentation outweighed local input, potentially omitting sites with illegal activities not captured in property records.

In Birmingham, the few attempts to invite neighborhood associations into the fray received limited response. Low turnout could be attributed to a lack of saliency for neighbors of brownfields not slated for precipitant redevelopment, especially if the invitations were framed in terms of brownfields rather than neighborhoods. The term brownfield has little meaning to most laypeople; for many of those more familiar with the concept, brownfields are an issue of environmental concern and therefore not perceived as relevant in the face of more pressing environmental and social threats. As with the other inventories, community participation was viewed as being essential to redevelopment but something done in response to redevelopment proposals, not in anticipation.

The New Jersey task force and interagency team felt that public participation was more appropriate at the municipal level, where it would be necessitated by municipal politics. Opinions on the point at which end uses should be negotiated differed according to the staff member, with some asserting that the enumeration of desirable end uses in the Site Mart might hinder development. The site nomination tool, which enables anyone to nominate a property, appears to be driven by a need to centralize data collection from municipalities, not to facilitate the participation of non-professionals. Though the organizers of the Site Mart provided several examples of instances in which local knowledge might provide better information than official sources (including prior uses)

the site nomination tool's verification process defers to official documentation, meaning that illegal or undocumented land uses may slip through the cracks.

New Jersey responded to the lean side of the funding cycle by creating a program pairing municipalities with academic institutions. Though student teams bring technical skills and manpower to the inventory, their limited knowledge of the place sometimes results in potentially costly errors not caught by municipal representatives, as illustrated by the case of mistaken brownfield identification in Orange, New Jersey. As people with day to day knowledge of a place, communities may have unique knowledge of prior land uses, contamination events, and potential reuse. If brownfield redevelopment can be seen as central to the attainment of community goals, residents and organizations may offer time and information to the creation and maintenance of a brownfield redevelopment plan, crucial for local governments working with limited funding and manpower.

Whether in site identification, funding prioritization or inventory maintenance, communities were seen as the last group to be involved. While inventory makers regarded developers and academic institutions as essential partners, communities were perceived as having limited capacity to support the process, both in terms of expertise and resources. But they have an essential role to play in deliberating redevelopment priorities, identifying properties and appropriate end uses and keeping local governments abreast of pending real estate transactions. Community organizations have a constant neighborhood presence and know which properties have new tenants, which have become vacant, which have been taken off the market: valuable knowledge for inventory maintenance.

Clearly community organizations have varying capacities for participating in brownfield planning. As Lori Sheppard argued, many organizations are hanging on a shoestring and have no surplus resources to invest in an inventory. The organization's mission will determine its capacity and interest in participating, and many community organizations—even organizations in areas with lots of abandoned land—may not view brownfields as relevant to their mission. Nonetheless, some community organizations have identified brownfields as a primary part of their mission, and many others have unexpectedly found themselves engaged in brownfield redevelopment. Bethel New Life, a church-affiliated community development corporation on Chicago's West Side, developed its Industrial Triage process as part of its asset-based community development approach:

building on the strengths and capacities of the people and the place, starting with what we have, with what people know and want. We turn liabilities (like brownfields) into opportunities for "smart growth" in an urban community context. (Bethel New Life 2007)

Bethel New Life developed its Industrial Triage system to assess the redevelopment potential of former industrial parcels by considering four factors: real estate value and marketability, extent of environmental contamination, potential to contribute to local jobs, and applicable financial incentives and programs that will enhance the project's viability (McCullough 2006). Bethel New Life's reputation as a leader in community-based brownfield redevelopment led to an EPA-funded collaboration with the American Planning Association, directed at the production of a workbook and training module to engage community groups in brownfield redevelopment.

The participation of community organizations may undermine the perceived legitimacy of the inventory in the eyes of property owners, developers or politicians.

Local knowledge does not mean apolitical or agenda-free knowledge. Many community organizations thrive on politics, exerting political pressure through regular communication with elected representatives, establishing defensible catchment areas recognized by delegates, or fueling internal programs with public funding. Others have explicit political agendas and may have participated in resistance efforts or antagonistic interactions with property owners, city officials and local politicians. Lest the political nature of local knowledge deter inventory creators from seeking it out, it is important to briefly address the political tendencies of professional knowledge.

The real estate developers, engineers, designers and municipal employees engaged in brownfield task forces, being viewed as apolitical, are bestowed with the mantle of professionalism. Despite the perception of these actors as apolitical, their decisions on what information is important, how to test the credibility of information based on its source, and how to attract the participation of property owners are value-based and therefore political decisions. These politics are couched in the language of professionalism: the language of aesthetics, market demand, statutes and risk assessment. These actors' shared objectives—creating an environment attractive to investors and returning land to the tax rolls—are deemed apolitical because they do not obstruct development, though they may attempt to direct it. Divergent goals among professional groups are contested in methods less overtly antagonistic than politics such as competitive bidding. Students from partnering academic institutions, having no financial stake or political history in a particular area, are viewed as neutral information processing units. But students also have objectives (sometimes overtly political) and time constraints

which favor expedient processes for assessing and inputting information, sometimes in contradiction to espoused principles.

Political resistance to collaboration with community organizations will likely correlate strongly to the discretion afforded them. If community organizations were given the same discretion as students in New Jersey’s CMAP program—entrusted with property background checks and allowed to input files to the database—there would likely be substantial opposition from property owners and the elected officials held publicly accountable. But if community organizations were invited to nominate sites for inventory inclusion, and those nominations were then subjected to review by public officials or a “neutral” entity, there will likely be less opposition. Activities in which community organizations might be included in brownfield inventories and the superficial advantages and disadvantages of that engagement are assessed in Table 1.

Table 1. Community Knowledge Inclusion

<b>Knowledge Injection</b>	<b>Advantage</b>	<b>Disadvantage</b>
Designing inventory	Adds to richness of database	Labor-intensive to identify relevant groups  Labor- & time-intensive design sessions
Identifying brownfields	Uncovers brownfields not listed in regulatory databases  Leverages community visioning/inventories already undertaken by community organizations	Requires site history review (background check)  May inflame property owner
Reporting undocumented land uses (e.g. illegal dumping) on known brownfields	Suggests possible contaminants that otherwise may not be tested for  Part of site history documentation required environmental assessment procedure for EPA's all-appropriate inquiry rule (rule only stipulates interview with adjacent property owners)	Without blatant evidence of the undocumented use, may be difficult to determine credibility of information  Suggestion of persistent and costly contaminants may deter property investment  May inflame property owner
Suggesting end uses	Leverages community visioning/inventories already undertaken by community organizations  Potentially leads to consideration of more innovative real estate products  Potentially lowers political resistance to forthcoming projects by initiating dialogue between developer and community	Depends on capacity of organization  Suggested end uses may not seem feasible or desirable to interested developer, obstructing investment
Performing background checks on nominated sites	Supplements limited manpower & funding	Requires training on historical land use documentation and contaminants correlated with land uses  Potentially compromises credibility of inventory by delegating fact checking to group without professional training and with particular political or development agenda
Reporting status changes on parcel availability	Constant neighborhood presence enables real-time updates	Relies on vigilance of community organizations

Involving communities in brownfield inventories can be intimidating as inventory makers are acutely aware of the threat of litigation from injured property owners. Fear of liability to injured property owners contributed to the design of all three inventories. To hedge against the threat of litigation inventory makers performed extended background checks on properties proposed by community members and municipalities, typically weighting property records more than anecdotal accounts of past use. Kenton County's decision to keep the database off the internet may limit its utility for attracting outside developers to the county, and may even limit its usefulness for individual cities. While Bob Wilkerson viewed New Jersey's voluntary participation as ideal, that model has been debilitated by its risk avoidance. The new administration in New Jersey is so risk avoidant it abandoned inventory expansion plans approved by the attorney general as being within the bounds of the law, and plans to allow property owners to decline participation even when contamination on those properties is already a matter of the public record.

### *Avoiding Litigation*

The threat of litigation by property owners is not easily dispelled but can be mitigated by employing parallel strategies. First, inventory makers should recruit brownfield ambassadors: former brownfield owners who have successfully navigated redevelopment and can share their experiences with current owners. Second, framing brownfield inventories as part of larger planning processes redirects the focus from the disposal of potentially contaminated properties to the fulfillment of larger community goals.

Although local governments generally create inventories to market sites for redevelopment, they often omit the most crucial selling point of any property: whether the current owner wants to sell. Getting information on prior uses and future prospects from property owners is one of the greatest challenges faced in building an inventory. For many property owners the prospect of publicly listing their properties as environmentally impaired opens the door to regulatory fines, legal battles and plummeting property values. Written invitations to property owners to nominate their properties to an inventory rarely elicit responses. Without the weight of regulatory compulsion property owners have little incentive to participate and plenty of incentive to respond defensively. But without the participation of property owners, brownfield inventories provide little information on which owners might be more likely to sell. Property owners who have engaged in brownfield redevelopment can provide crucial diplomatic ties between municipalities, environmental agencies and brownfield owners. Seeing proof of other owners' profitable deals may convince owners that it may be in their interest to dispose of properties.

Framing the conversation with property owners around planning for neighborhood redevelopment may further reduce tensions by redirecting the focus from liability; this reframing is better suited to non-regulatory agencies without a history of punitive action against property owners. However, in some political environments the concept of planning will hardly be more palatable to property owners than the concept of CERCLA liability. It is worth recognizing that the sacrosanct nature of property rights evolves with the pressures of urbanization and the attendant political development of



communities. As declining cities repopulate and booming cities meet the limits of their growth, the staunchest property rights advocates may assert the need for planning.

### **A Process Outline**

I do not propose an idealized process for conducting a participatory brownfield inventory. What I propose responds to funding shortages, antagonistic property owners, indifferent municipalities and a dormant citizenry. I attempt to create a method for eliciting participation that will go beyond the token participation of a few development-minded “community” members, while acknowledging the time constraints placed on EPA grant recipients, grants that encourage public participation while limiting the time agencies can spend soliciting participation. The process I outline may be more appropriate for municipalities or regional planning commissions than state-level agencies; at the state level, establishing meaningful contact with community organizations may be untenable, and demanding that municipalities engage community groups likely leads to little more than token participation.

Performing an in-depth inventory throughout a large municipality or region will likely be a time-consuming endeavor with little return, and will necessitate a consistently high recurring investment for maintenance. By creating a pilot inventory with a few responsive municipalities and community organizations the sponsoring agency can achieve the short-term goal of identifying key sites ready for redevelopment with less cost and time. Even if the task force’s long-term goal is to involve as many municipalities and organizations as possible, attempting to do this in the short-term will be resource-intensive and ultimately may be futile. Some municipalities will not respond to requests

for participation. Luckily, county, regional and state-wide inventories are not required to be comprehensive. The earlier an inventory spurs redevelopment, the more likely it is to elicit participation from other municipalities and build a track record with state and federal agencies to ensure future funding. By demonstrating the inventory's role in generating successful redevelopment and explicitly linking redevelopment to local objectives, the task force may best elicit participation.

The inventory should be framed as a community planning process with partnering municipalities and organizations designed to identify underused properties that can be leveraged to achieve local goals. The first step of the planning process is to decide what types of properties to identify based on geographic and physical characteristics. Once priority typologies are determined, the partners must identify properties. Regulatory lists of contaminant releases and regulatory actions are of little use for identifying brownfields; many of the properties listed are active businesses or stations along utility pipelines, not underutilized or vacant properties. Additionally, many sites perceived as being contaminated have not made it onto regulatory lists because no contamination has been reported. Uncovering brownfields takes detective work: combing through regulatory lists, talking with municipalities, economic development directors, public safety officials and community organizations. Many people have little familiarity with brownfields and need to be guided through visual indications of contamination and typical prior uses. Once information has been collected from participants, it must be tested against official documents of land use. Not all past uses of a property will be captured in official documents, especially sites that have been vacant for many years and have become hotspots of illegal activity such as chemical dumping. Anecdotal information that does

not match official sources should be corroborated by multiple independent sources in order to build a substantial burden of evidence.

The planning process should be used to identify the metrics for prioritizing brownfields for redevelopment, taking into account both the physical characteristics of a property and its role in the surrounding area. A property's anticipated contamination is as central to its role in strategic redevelopment as its other physical characteristics such as the condition of existing buildings or size. Some otherwise attractive properties may be expected to have astronomical cleanup costs based on their prior uses or may be surrounded by parcels with severe contamination. Other metrics might include proximity to important land uses such as commercial corridors or schools, severity or frequency of crime at or near the property, its potential to fulfill key needs in the surrounding community such as affordable housing or its potential for innovative developments such as clean energy fields. Planning meetings may also be used to define appropriate development incentives, desired end uses and possible proposed end uses unacceptable to the community. The planning process will also reveal the properties most in need of public subsidies such as brownfield grants or low-interest loans used to leverage financing for projects that cannot sustain themselves. These planning meetings prepare the municipality to issue richer Requests for Proposals with greater details on proposal requirements or bonuses for mixed-use development or commitments to hiring local residents for construction. For privately owned properties the planning process may be used to refine requirements for permitting including peripheral investments that would be required of developments over a certain size.

Early in the process the sponsoring agency should meet with state counsel to determine legal responsibility for notifying property owners. An inventory that requires voluntary participation of property owners may result in very few documented properties. If the brownfield inventory is part of a larger planning process, there is less need to obtain the consent of property owners, in the same way that zoning changes and community visioning meetings do not require property owner consent. However, a planning process will be more substantial if property owners are involved. The first communication with property owners of potential brownfields should include contact information of former brownfield owners who can field questions about the process and offer their own experiences; former brownfield owners also should be present at planning meetings. Development incentives and subsidy programs for property owners may be the key focus of breakout groups at meetings.

Ribbon cuttings, media coverage and civic events are important to creating the hype needed to scale up the inventory beyond the pilot phase. In the short term the inventory's success may be indicated by the number of municipalities demanding to be included, but from the beginning the convening agency should put in place tools for measuring long-term effectiveness. A GIS-based inventory will enable periodic spatial and demographic assessments to see where investment is flowing, who has been excluded and what effect the brownfield initiative has had on the wider community.

There is an irresolvable tension between creating locally relevant brownfield inventories and allocating resources efficiently. Building and maintaining centralized inventories may be complicated by local resistance from municipalities resentful of top-down directives without matching funds, and without local participation the inventory

will be no more useful than existing regulatory databases. Federal grants cannot perpetually support local inventories, and with the majority of inventory grant money funding software acquisition and development, little remains for long-term maintenance. There seems to be little logic to devoting precious funds to redundant software construction for unique inventories in any given place, yet municipalities and regions may have distinct priorities demanding different platforms. As more municipalities and regions build brownfield inventories, the EPA may consider funding the construction of a standard platform with customizable database and mapping features, providing a more affordable option than a custom-built database.

### **A Need for New Resources**

For brownfield inventories to contribute to dynamic plans participants at all levels must acquire the capacity to engage in planning. Communities have the advantage of a pending publication and training modules created in collaboration between the American Planning Association and Bethel New Life. The Community-Based Brownfields Redevelopment Strategies program is intended to help “community groups in low-income communities develop a new set of ‘eyes’ to see brownfields sites as opportunities” (APA 2007). The APA should create a similar resource to help local governments design planning processes for brownfield redevelopment. Such a resource should provide methods for eliciting participation from municipalities and aligning brownfield redevelopment with community goals, metrics for prioritizing brownfields, and strategies for leveraging subsidies to finance innovative reuses.

The Environmental Protection Agency has already contributed enormously to resolving the technical and legal obstacles of brownfield redevelopment; its real task now is to tackle the social and economic impediments to improving local environmental quality. The agency should continue to support external initiatives such as the APA's Community-Based Brownfields Redevelopment Strategies. The EPA must also strengthen its internal brownfields program by attracting more staff with dual proficiencies in the environmental sciences and planning or community development, people who can help local governments revitalize people and places.

## **Conclusion**

Without schemes for making brownfield redevelopment more relevant to the lay population, participatory instruments will be little used. Brownfields must be imbued with a more potent image than interstitial space and be captured in the collective consciousness as images of resurrection and renewed prospects. Stories of promise are not universal; what connotes prosperity and improvement for some spells displacement and aggression for others. If brownfield redevelopment is not to become a new incarnation of Urban Renewal, strategic efforts must be guided by the goals of the plurality, refined through the exchange of ideas.

Localized inventories may best nurture the personal relationships needed to extract and fairly test community knowledge, complementing institutional structures with robust social networks. But not all cultures provide equal channels for local knowledge to be transmitted or tested. Trust and bias will enable or frustrate the incorporation of local knowledge, both in the ways it is pulled from social and organizational networks and the

ways it is assessed by those with power. The capacity of a brownfield inventory to facilitate mutual learning among laypeople and professionals depends on the culture of participation in the particular place in which it is undertaken. Participation may be steeped in a local culture, or may be championed and enabled by individuals empowered to facilitate it. Places where participation is demanded by citizenry and embraced by authorities provide more fecund environments for long-lived, textured inventories. Where participatory inventories persist through the efforts of individual champions their continuation is more tenuous. Yet culture adapts, and the relationship between a participatory inventory and the culture of a place is reciprocal. With investment in the place-based social networks surrounding brownfields, an inventory may do more than simply catalogue potentially-contaminated land; it may create common visions, fostering respect, support and cooperation where none exists.

## Appendix A: Interview Template

Tell me how the inventory project began.	
Who sponsored your mapping project?	
How were you involved in the inventory project?	
Who is the intended audience?	
What sources did you use in creating your brownfields mapping project?	
Is the map web accessible? How did you decide to make it web accessible?	
Must property owners voluntarily participate? If so, how did you decide to make participation voluntary for property owners?	
I noticed that site nomination is part of the process. Who can nominate sites?	
How do you decide if a nominated site will be incorporated into the inventory?	
How many nominations would you say you've received? How many of those make it to the inventory level?	
Are there mechanisms for the public to suggest end uses or provide other	



information beyond site identification? If so, is that included in the inventory?	
How do people find out about the inventory? How did you elicit input?	
<i>If community organizations were involved:</i> Have you noticed overlap between sites identified through regulatory lists and sites identified by the community? What about between community groups?	
What was the nature of the community-identified sites? How did they differ from the regulatory lists?	
How was community feedback filtered?	
Did you have concerns about legitimacy?	
How did you deal with conflicting information?	
Do you have any concerns about liability? If so, how did you address those concerns?	
How familiar were people with the concept of brownfields? How did you orient them to the concept?	
Have you kept track of redevelopment on properties listed on the inventory? How many have been redeveloped, what uses, how many received public funding, etc.?	
Who else should I speak with?	



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