Financing Mechanisms for Addressing Remediation of Site Contamination

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List of Case Studies

Abbreviations

BBIA: Bond Backed Investment Authority
BEDI: Brownfield Economic Development Initiative
CSO: Civil Society Organization
CSP: Collateral Support Program
DDA: Downtown Development Authority
ERF: Environmental Response Fund
IPF: Investment Project Financing
LRF: Loan Loss Reserve Funds
NMTC: New Market Tax Credit
PAB: Private Activity Bond
PCB: Polychlorinated Biphenyl
PPP: Public Private Partnership
RLF: Revolving Loan Fund
TIF: Tax Increment Financing
VCP: Voluntary Clean Up Program

Currency Equivalents

(Exchange Rate Effective May 1, 2014)
1.00 United States Dollars (US$) = 0.72 Euro (€)
1.00 Euro (€) = 1.39 United States Dollars (US$)

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Introduction

Industrial and commercial facilities provide great economic benefit to communities throughout the world. Unfortunately, many industries use or have used practices and materials which have proven toxic to the environment and to those who live and work near contaminated sites. The definition and degree of contamination varies at national and regional levels of government, but leaders throughout the world now recognize the hazard that contaminated industrial and service sites present to the wellbeing of their communities and seek innovative ways to finance the remediation of these challenging sites.

Industrial contamination can have a severe, direct impact on adjacent communities. The cleanup and redevelopment of a so-called "brownfield"[1] can "improve a community's economy, provide an opportunity for habitat restoration, and create public space."[2] Cleanup and redevelopment of brownfields can be an effective economic development strategy, with benefits seen in two timeframes. First, there is an immediate and one-time capital expenditure for cleanup activities, infrastructure, and construction. The initial investment generates tax revenues, temporary family-wage jobs, and indirect economic benefits within the community. Secondly, there is a long-term economic impact from remediation projects in the form of higher property values, long-term tax revenues, and the attraction of external capital to the community by tenants of the revitalized property. [3] The economic benefit of contaminated site redevelopment is perhaps most clearly illustrated by permanent job creation from the restored properties.[4] The deleterious effects of industrial contamination across all facets of a community typically provide a strong incentive for leaders to seek financing mechanisms that make site remediation possible.

There is a tremendous variation in the definition and severity of industrial contamination across countries. Countries with the longest history of industrialization and largest number of contaminated sites, such as those in North America, Europe, Australia, and East Asia, tend to have the most well-defined policies and regulations for contaminated sites, but many other countries lack definitions or regulations related to site contamination.

Regulated contaminants vary among jurisdictions, commonly ranging from "solvents, oils, petrol, and heavy metals, to radioactive substances."[5] Many countries differentiate between contaminated sites which can be assessed according to a standard, and those which require specialized assessment. Australia, for example, considers "unexploded ordnance, radioactive substances, biologically pathogenic materials and wastes, and contaminated sediments" to fall into specialized categories of contamination.[6] Again, variations exist among countries in the definition and priority of contaminated sites—the preceding information is intended to illustrate the variety of type and severity of contamination on a global scale.

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[1] The definition of "brownfield" is a formerly developed industrial site whose future development prospects are impaired by real or perceived contamination. For the purposes of this report, "brownfield" may include operational or abandoned factory sites, dumping sites, or any structures containing (or perceived to contain) substances hazardous to human health.

[2] State of Washington Department of Ecology (2009). *Guide to Leveraging Brownfield Redevelopment for Community Revitalization: Building Capacity in Washington State.* Retrieved from http://www.cdfa.net/cdfa/cdfaweb.nsf/ordredirect.html?open&id=wabrownfieldsguide2010.html

[3] Ibid.

[4] Ibid.

[5] Scottish Environmental Protection Agency (2013). *Contaminated Land.* Retrieved from http://www.sepa.org.uk/land/contaminated_land.aspx

[6] National Environment Protection Council (2013, April 11). National Environment Protection (Assessment of Site Contamination) Amendment Measure. Retrieved from www.comlaw.gov.au

Experience in countries with contaminated site programs has shown that the complexity and cost of remediation and restoration of sites only grows with time. While most countries have some legislation or actions related contaminated site management, they are insufficient or not fully effective and thus low and middle income countries need to development and implement a program for contaminated sites.[7] This involves policy, legislation, regulatory, implementation, and organizational aspects. An action agenda of short- and longer-term actions should be established, including the possibility of creation of a national management plan for contaminated sites.

Historical models for contaminated site remediation have placed the financial burden upon the companies whose operations led to the contamination. This so-called "Polluter Pays Principle," though economically fair, does not take into account the lack knowledge regarding environmental releases underlying earlier decades of the industrial age.[8] Additionally, many contaminated sites are products of companies which no longer exist or do not possess the capital to remediate the sites to legal standards. Some of these sites have transferred to the ownership of a bank or a government entity, while others may remain in the ownership of an extant corporation. A site could still be operational, but the presence of contaminants in certain areas may require remediation to ensure compliance with government regulations. A variety of possible ownership and occupancy conditions may exist where the Polluter Pays Principle is not entirely feasible, and in such cases the surrounding community often suffers from unfavorable economic and environmental conditions. In the absence of a clearly identifiable and financially capable polluter the burden of financing industrial site remediation typically falls on the public sector.

Government entities frequently prioritize abandoned sites to receive public financing for remediation. The intent of this paper is to address financing mechanisms which can help remediate operational contaminated sites in addition to abandoned brownfields. That said, most targeted remediation programs are specific to abandoned industrial sites, and the bulk of specific resources referenced herein will necessarily be limited to the remediation and redevelopment of vacant contaminated sites.

The purpose of this study is to provide an introduction to the multitude of diverse financing mechanisms currently being used to remediate contaminated sites. The report is based upon various mechanisms that exist in the United States and some emerging financing models and tools developed in Europe.

How to Use This Report

This report is intended to provide information to communities and countries interested in identifying potential financing tools for the remediation and redevelopment of contaminated industrial sites. Specific audiences who will find this report useful include finance officials, contaminated site program managers, and economic developers.

The report is by no means exhaustive, and individual governments are encouraged to research programs of interest in greater detail prior to implementing any of the financial models referenced herein. All financing mechanisms must be examined prior to implementation to ensure compliance with all applicable laws and tax structures. It should also be noted that fundamental tax code and economic status often dictate the efficacy of a specific financing mechanism within a country. For instance, the United

[7] World Bank (2014). Developing a Program for Contaminated Site Management in Low and Middle Income Countries. Retrieved from https://openknowledge.worldbank.org/handle/10986/18631

[8] Cordato, R. (2001). *The Polluter Pays Principle: A Proper Guide for Environmental Policy.* Retrieved from http://iret.org/pub/SCRE-6.PDF

States government has granted state and local governments the right to issue tax-exempt bonds, thus creating a municipal bond market through government intervention. In order for countries to implement the types of programs addressed in this report, fundamental legal structures may have to be established or adapted by national government.

Wherever possible, case studies include a diversity of applications for a given financing mechanism. This has been done to illustrate how programs can be adapted to various levels of government (national, regional, local), economic systems, and degrees of contamination. The general infrastructure of each program is relatively the same but the implementation structure can vary widely.

This report is divided into the following categories of financing mechanisms:

1. Bond Finance Programs
2. Loan Fund Programs
3. Tax Increment & Special Assessment Finance Programs
4. Tax Credits & Incentives Programs
5. Grant Financing Programs
6. Emerging Finance Models

The report includes four appendices:

Appendix 1: Capitalization of Loan and Grant Programs for Contaminated Site Remediation
Appendix 2: Financing Mechanisms at a Glance
Appendix 3: Glossary of Key Terms
Appendix 4: References

Each section provides an overview or introduction to the financing tool at a basic level, identifying underlying economic and legal conditions that must be in place prior to creating programming to address contaminated site remediation. After the description of each financing mechanism is a discussion on how the mechanism can be implemented and administered to greatest effect. Case studies of existing programs follow to illustrate how concepts can be adapted to diverse situations.

Finally, there is an analysis of the relative strengths/opportunities and weaknesses/limitations presented by each financing mechanism and a discussion of its potential to address contaminated sites globally. Appendices list supplemental information related to the funding, development, and administration of remediation programs, as well as matrices comparing financing mechanisms and evaluating their global applicability. Individuals seeking more in-depth information related to the implementation of any of the financing mechanisms outlined within this report should seek the guidance of the World Bank for customized technical assistance.

Section 1: Bond Finance Programs

1.1: An Introduction to Bond Finance

Bond financing is a highly effective development finance tool. For example, bond financing in the U.S. has emerged over the past 100 years as a mechanism to address essential governmental functions, such as the provision of transportation, infrastructure, clean water and environmental remediation. Bonds are, in fact, one of the most prevailing financial mechanisms for addressing brownfield redevelopment through a variety of structures and schemes.

A bond is essentially a loan with the entity issuing the bonds on the capital markets[9] in return for cash. The cash is then put into projects and the loan is repaid through dedicated revenue streams such as taxes, assessments, fees and tolls. Two types of bond issuing entities are: governments and private sector/company. The distinguishing feature of governmental bonds in the United States, such as those issued by state and local municipal entities, is that the interest income earned by the bond holder is exempt from federal income taxes.[10] Typically, states also exempt the interest income from bonds issued by the state, its agencies, and political subdivisions from its state and local income taxes. The tax-exempt feature of municipal bonds makes them attractive to individuals and other buyers in higher marginal tax brackets. The tax exemption enables state and local governments and their various political subdivisions to come to capital markets and borrow funds at lower interest rates than those prevailing in the taxable markets such as the corporate bond market.

One of the key strengths of bond financing is the relative flexibility when using this tool. Bonds can be used for directly financing the cleanup of certain contaminated sites. However, bond proceeds are also frequently used by communities to seed brownfield-specific loan programs or in partnership with other tools such as tax increment finance and tax credits. These tools will be discussed in more details in subsequent sections.

1.2: Governmental Bonds

Governmental bonds[11] may be used for many public purposes (e.g., highways, schools, bridges, sewers, jails, parks, government equipment and buildings, etc.), and private entities may not significantly use, control or own the facilities financed. Governmental bonds benefit the general public and should address an "essential government function." In contrast, qualified Private Activity Bonds (PABs) benefit private entities.[12] Whether bonds are governmental or PABs depends on whether there is an arrangement that will likely transfer the benefits of tax-exempt financing to private (nongovernmental) entities. The cleaning up of brownfields can be defined to qualify as an "essential government function."

The objective of issuers is to raise capital at the lowest cost. The tax-exempt treatment of governmental

[9] Capital markets consist of individual and institutional investors active in buying and selling stocks, bonds, and other securities.
[10] Section 103(a) of the U.S. Internal Revenue Code (IRC) of 1986 specifically exempts the interest income earned on municipal bonds from federal taxation. The Tax Reform Act of 1986 represents the most recent fundamental reform of the tax exemption to a select number and type of municipal bonds.
[11] The Tax Reform Act of 1986 also distinguished between two types of municipal bonds, Governmental Bonds and Private Activity Bonds (PABs), and sets forth requirements relating to each type. The interest on governmental bonds is exempt from federal taxation, while the interest on PABs is not, unless the bonds meet certain conditions, i.e. are "qualified."
[12] A third type of bond, corporate bonds, may also be available to finance the remediation and redevelopment of contaminated sites. However, these bonds are coordinated solely between private borrowers and lenders and are therefore not a public finance tool and are not covered in this report.

bonds makes them the lowest cost alternative. However, to prevent the abuse use of tax-exempt bonds, the private business use, private security or payment, and private loan financing tests act to limit the amount of private sector involvement with facilities financed with governmental bonds. These tests, part of federal law in the United States, are inherent in making sure the precious public benefit of tax-exempt bonds is preserved and protected. Qualified PABs, on the other hand, permit almost unlimited private sector involvement, but at a higher interest rate, given the same purpose for which bonds are issued.

1.3: Private Activity Bonds

PABs are issued for the benefit of private individuals or entities and can only be issued on a tax-exempt basis if they are "Qualified PABs." In order to be qualified, a bond must first meet the definitions of private activity. These include being issued for a substantial private purpose and/or being structured as a private loan. Additionally, the bonds must be issued for a specific purpose defined in the tax code as worthy of receiving the benefit of tax-exempt interest. The Internal Revenue Code (IRC) of the U.S. permits the financing of numerous categories of facilities as qualified PABs. The most relevant to brownfield remediation are found in the table below.

U.S. PAB Category	Description
Exempt Facility Bonds	Issued for private infrastructure projects, including: airports, docks, wharves and rail; water and sewage; solid waste; certain energy projects; and more.
Redevelopment Bonds	Issued for redevelopment projects in blighted areas, including contaminated sites.
501(c)(3) Bonds	Issued for charitable nonprofits, including hospitals and educational institutions, for facilities and certain other costs.
Small Issue Bonds for Manufacturing	Issued for eligible, small manufacturers to expand their manufacturing facilities.

With each of the above categories of qualified PABs, bonds must meet very specific requirements of the United States IRC. These requirements could vary in a global application of this concept, depending on national economic, social, and legal conditions. Qualified PABs are used either entirely or partially for private purposes and are given federal tax-exempt status.

1.4: Representative Case Studies

1.4.1: City of Chicago, Illinois

The City of Chicago established the Chicago Brownfields Initiative in 1993 to acquire, assemble and rehabilitate properties, returning them to productive use.[13] The Initiative links environmental restoration with economic development by cleaning up and redeveloping brownfields and by improving policies to promote private redevelopment of brownfields. The City funded the Brownfields

[13] City of Chicago (2013). *Chicago Brownfields Initiative*. Retrieved from www.cityofchicago.org/city/en/depts/dgs/supp_info/chicago_brownfieldsinitiative.html

Pilot Program with $2M in general obligation bonds, expecting it would pay for environmental testing on the five selected properties and remediation on two. In fact, the City was able to return all five sites to productive use for a total of about $850K. The City's assessment and cleanup of the sites also resulted in new construction activity and the creation of more than 100 jobs. The City's experience with these sites laid the groundwork for continued innovation with an aggressive large-scale cleanup program.

The impact of the Chicago Brownfields Initiative has improved environmental and economic conditions in a variety of urban neighborhoods. The California Avenue Business Park, for example, located in the Western Ogden Industrial Corridor, was created through a brownfields revitalization project using proceeds from general obligation bonds.[14] 37 acres of contaminated land were remediated through a $1.8M investment, removing 964 tons of contaminated soil and creating an estimated 600 positions upon park development.

1.4.2: State of Oregon

Oregon's Brownfields Program is available to provide financing for the full range of environmental activities—assessment through cleanup—associated with brownfields redevelopment. The department manages two brownfields financing funds: the $9.5M Oregon Brownfields Redevelopment Fund, funded by proceeds from the sale of state revenue bonds; and the $2.85M Oregon Coalition Brownfields Cleanup Fund, capitalized through a revolving loan grant from the U.S. Environmental Protection Agency. (See Section 2). Both programs are primarily revolving loan programs, with a maximum term of 20 years; however limited grants can be awarded on a case-by-case basis for publicly-owned projects, depending on a financial analysis of the applicant's debt capacity and public benefits of the redevelopment project.[15]

In 2004, the Port of Portland acquired a 700-acre abandoned site which once housed an aluminum smelter.[16] Partnering with Alcoa, FedEx Ground, Business Oregon, the Oregon Department of Environmental Quality, and other entities, the Port remediated and redeveloped the site to create recreation, wetlands, and natural space in addition to a regional distribution hub and industrial park. Estimates for job creation surpass 3,500 positions upon the completion of redevelopment.

1.4.3: State of Ohio

The Clean Ohio Bond Program is a bond-backed investment authority supported by revenue streams from liquor sales. The state program invests in brownfield site assessment and remediation through two subprograms, Clean Ohio Revitalization Fund and Clean Ohio Assistance Fund.[17] These subprograms provide grants and loans to remediation projects. The program was funded by a $400M bond issue that allocated $200M for brownfield redevelopment and $200M for preservation of green space. Since its inception the program has proven to be highly successful in catalyzing community and private investment into revitalization efforts. The return on investment ratio is nearly $10 for every dollar spent.

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[14] City of Chicago (2003). *Chicago Brownfields Initiative: Recycling Our Past, Investing in Our Future.* Retrieved from www.csu.edu/cerc/documents/ChicagoBrownfieldsInitiativeRecyclingOurPastInvestinginOurFuture.pdf.

[15] Business Oregon (2013). *Brownfields.* Retrieved from www.oregon4biz.com/Business-financing-resources/Oregon-Finance-Programs/Brownfields-Redevelopment-Fund/

[16] Siemers, E. (2011, April 7). Port's Troutdale Project Wins National Brownfield Award. *Portland Business Journal.* Retrieved from www.sustainablebusinessoregon.com/articles/2011/04/ports-troutdale-project-wins-national.html?page=all

[17] Ohio Development Services Agency (2013). *Clean Ohio Fund.* Retrieved from development.ohio.gov/cleanohio/BrownfieldRevitalization/Default.htm

The Ohio State Controlling Board approved $896,048 through the Clean Ohio Revitalization Fund to assist the City of Dayton in the remediation of a 12-acre contaminated industrial site located west of downtown.[18] Funds were used to clean up soil and groundwater as well as demolish structures associated with the former NIBCO foundry site. Potential job creation was considered in funding the project, but no commitments or estimates were required.

1.4.4: State of California

In November 2006, California voters approved a proposition which authorized the issuance of $2.85B in bonds for the direct remediation and reuse of brownfields throughout the state. Later, the Legislature allocated monies to CALReUSE, a state administered program focused on "brownfield cleanup that promotes infill residential and mixed-used development, consistent with regional and local land use plans." CALReUSE offers low-interest loans and grant funding from $50K to $5M.[19]

The City of San Diego received $1.5M from CALReUSE to finance the remediation of a site contaminated by petroleum hydrocarbon, with both soils and groundwater affected by a former underground storage tank. After remediation, development of a mixed-use, transit-oriented development commenced, adding 200 units of affordable and senior housing to the city.[20]

1.4.5: City of Elizabeth, New Jersey

The city of Elizabeth issued general obligation bonds to spur a $320M investment now known as the Jersey Gardens Metro Mall. The site was a 166-acre former garbage dump on the New Jersey Turnpike, just outside of New York City. The Landfill Reclamation Act allowed for the assessment of a 3% franchise fee on all mall sales, revenue from which could be used to service the bonds.[21] The developer of the site stood as guarantor to the deal. Today, a 1.5M square-foot mall employs 5,200 people, mostly area residents. The site now generates $4.2M in annual tax revenues for an area that essentially generated nothing before this transformational project.

1.4.6: City of Bridgeport, Connecticut

Bridgeport financed part of its $21M Harbor Yard minor league baseball stadium with general obligation bonds.[22] Jenkins Valve Corporation closed its doors, leaving 18 acres of contaminated property along Bridgeport's waterway. Creatively structured, the bonds are paid using a share of gate and concession receipts. These bonds provided low-cost, long-term capital to transform an abandoned and heavily contaminated brownfield site into a catalyst for urban revitalization. 700 jobs were created through this project, which continues to attract hundreds of thousands of visitors to the city each year.

1.4.7: Europe 2020 Bond Project Initiative

Within Europe and Canada, project bonds are more common financing mechanisms for the remediation of contaminated industrial sites. Project bonds are issued by public-private partnership project companies and typically held by institutional investors such as pension funds and insurance

[18] Funding Approved For Dayton Foundry Site (2009, February 18). *Whiotv.com,* Retrieved from www.whiotv.com/news/news/funding-appproved-for-dayton-foundry-site/nHzZ5/

[19] California Pollution Control Financing Authority (2011). *CALReUSE Program: California Recycle Underutilized Sites.* Retrieved from www.treasurer.ca.gov/cpcfa/calreuse/annualreport/2010.pdf

[20] Ibid.

[21] Bartsch, C. and Wells, B. (2006) *Local Brownfield Financing Tools: Structures and Strategies for Spurring Cleanup and Redevelopment.* Retrieved from policy.rutgers.edu/vtc/tod/newsletter/vol6-num2/Brownfield%20local%20financing%20tools.pdf

[22] U.S. Environmental Protection Agency. *A Brownfields Toolkit: From Brownfield To Ballparks in Bridgeport, CT.* Retrieved from www.epa.gov/region4/brownfieldstoolkit/casestudies/csnatlsports.pdf

companies.[23] Canada has a more mature market and regulatory system surrounding project bonds, which are still a relatively new concept in much of Europe. Unfortunately, institutional investors are moving away from this mechanism due to higher reserve requirements, construction risk (sometimes mitigated through strong completion guarantees), and the long-term nature of the investment.

To further the use of this development tool, the European Commission launched the Europe 2020 Project Bond Initiative in 2010. The Initiative, a collaboration between the European Commission and the European Investment Bank, is intended "to provide EU support to project companies issuing bonds to finance large-scale infrastructure projects" in the fields of transport, energy, and broadband.[24] Brownfield projects are specifically listed as an area of investment interest within this structure. The Initiative will share risks during the construction period, offering guarantees or loans to support the bond project. The pilot program for the Europe 2020 Project Bond Initiative launched in November 2012, injecting €230M of seed funding to stimulate up to €4.5B in total project investment.[25]

1.5: Strengths/Opportunities of Bond Financing for Contaminated Site Remediation

Low Interest Rates: Tax-exempt governmental bonds are highly desirable for investors due to historical repayment history and security. These bonds therefore foster low interest rate environments for borrowers seeking to redevelop contaminated industrial sites.

Large-scale Funding: Bonds can provide significant sources of upfront capital for addressing a wide range of project financings. Because of this feature, sites with more expansive or more complex forms of contamination can tap into larger sources of financing than private markets alone could supply. This lowers the barrier of access to financing redevelopment projects.

Ability to Pool Projects: By combining multiple, related projects into one issuance, the fees associated with bond issuance are shared and can lower the cost of capital for borrowers. Additionally, aggregating projects and having a diverse source of repayment can help achieve lower interest rates. The pooling feature can be used to refinance active projects or to seed loan programs dedicated to brownfield redevelopment projects.

Precedent: Bonds are a well-established economic development tool with a very mature market in the U.S. and Western Europe. Although these tools have not been utilized as often—if at all—in other countries, the extensive program examples, case studies, and legal precedents provide a strong foundation for new adopters.

Public Endorsement: The credit strength of a governmental jurisdiction can strengthen transactions as a result of taxing authority. This added security for investors can increase the capital available to finance contaminated site redevelopment efforts.

Credit History: Bond markets are generally sophisticated, and investors are prepared to price deals according to their level of risk. Governments or projects accessing the markets with a credit rating from a

[23] Eurofi (2011). *The Europe 2020 Project Bond Initiative.* Retrieved from http://www.eurofi.net/wp-content/uploads/2012/09/Eurofi_Project_Bond.pdf
[24] European Investment Bank (2013). *The Europe 2020 Project Bond Initiative—Innovative Infrastructure Financing.* Retrieved from http://www.eib.org/products/project-bonds/
[25] Ibid.

ratings agency will be able to have their bonds priced appropriately.

Cost Sharing: Private Activity Bonds present significant potential for public-private partnerships. With public and private sectors investing in a contaminated site, a wealth of expertise and resources becomes available to promote the ultimate success of the redevelopment project.

Credit Enhancement Tools: Projects with insufficient creditworthiness can benefit from programs and tools designed to enhance a borrower's credit, such as a letter of credit or guarantee. This allows a greater pool of potential developers to invest in brownfield sites by lowering barriers to acquiring the necessary capital to redevelop a contaminated site.

Bond-Backed Investment Authorities (BBIAs): BBIAs generate large pools of monies which can be used to capitalize targeted secondary and tertiary spin-off programs (e.g. revolving loan funds [See Section 2]). Spin-off programs such as brownfield redevelopment revolving loan funds have the potential to generate revenue to be used for repayment.

1.6: Weaknesses/Limitations of Bond Financing for Contaminated Site Remediation

Legal Requirements: Considerable legislative action and regulatory policies are essential to a successful bond program. Additionally, the definition and remediation of contaminated sites must be expressly approved by legislative and regulatory action.

Potential Lack of Established Markets: Often little bond financing experience exists in developing countries. Furthermore markets may be immature and volatile. Unless already present, the lack of a dedicated revenue stream will put pressure on outstanding bonds as more bonds are issued. Governments will need to pool brownfield projects to bring a critical mass of deals together to achieve issuance.

Positive Attributes Dependent on Market Conditions: Credit risks and poor credit quality of both issuers and borrowers impact feasibility of use, potentially rendering positive aspects of bond finance moot. In addition, the lack of a critical mass of successful projects could make bringing new issuances to market difficult.

Public Debt: Potential for default and risk to the sponsoring entity's credit rating is considerable. Higher risk bonds typically must be backed by local guarantees.

Requires Supplemental Support Programs: Issuing bonds for brownfield remediation will likely require considerable credit enhancement through collateral, insurance, letter of credit or other means. The process could be very challenging if these supplemental programs are not in place.

Generally Not Cost Effective for Projects <$3M: Most bond financings require the assistance of multiple financial professionals, rendering the projects prohibitively expensive for small deals. However, several agencies have created standardized systems to enable smaller projects.

Administrative Costs: Proceeds need to be delegated and monitored which requires significant professional oversight. Initiating new programs can be complicated. Furthermore, consultants are needed for smaller borrowers who are new to the process.

1.7: Applicability of Bond Programs to Address Contaminated Sites Globally

Bond programs can be used globally to provide capital toward the remediation of contaminated sites, but the structure of existing bond markets and individual national economies will greatly shape these programs and determine to an extent their efficacy.

In countries that lack a well-established bond market, the effort required to first create one may not be practical for the purpose of brownfields redevelopment or site remediation alone. Additionally, the cost savings associated with tax-exemption may not be available in countries which lack taxation on interest income. Ultimately, bond finance works most efficiently in countries with existing bond markets and a sufficient density of contaminated sites and potential developers to make pooling projects worth the investment of the community.

In countries or regions where those circumstances are present, the applicability of bonds for site remediation is great. Bonds provide a reliable source of financing from a large pool of investors with well-established expectations of return on their investments. The variety and scope of bonding mechanisms mean that this form of financing can work in small clean-up and site contamination projects, or a pooling of associated small projects, as well as in large, complicated remediation and redevelopment projects.

In the U.S., bond financing is one of the most highly used forms of financing to address brownfield redevelopment. One of the reasons bond financing is so applicable is because of the flexibility of this tool. Bond proceeds can be used to finance the costs associated with site remediation as well as to create brownfield-specific loan programs. In addition, bonds are often paired with other financing mechanisms, such as tax increment finance and tax credits, because of their reliability and flexibility.

For a more concise breakdown of this tool's use and applicability for site-contaminated clean-up, refer to Appendix 2: Financing Mechanisms at a Glance, which further breaks down this tool by structural requirement, level of government and level of contamination.

Section 2: Loan Fund Programs

2.1: An Introduction to Debt Financing

A Revolving Loan Fund (RLF) is a self-replenishing pool of money, utilizing interest and principal payments on active loans to issue new loans. Unlike with a grant or other expenditure-based fund, which must be recapitalized as the initial money is spent, the "fund" for a revolving loan program is intentionally designed to be self-sustaining as original loans are repaid. External capital is only required to initially establish or expand an RLF.[26] Achieving this sustainability goal requires careful attention to balancing the loan program's interest rate and fees with the level of default risk posed by the program's average borrower. RLFs are a widely used development financing tool in the United States and elsewhere. They are a financing measure primarily used for development and expansion of small businesses. While the majority of RLFs support local businesses, some target specific areas, such as health care, minority business development, and environmental remediation.

A RLF provides access to a flexible source of capital that can be used in combination with more conventional lending sources. Often, the RLF fills a gap between the amount a borrower can obtain in the private market and the amount needed to start or sustain a business. For example, a borrower may obtain 60% to 80% of project financing from other sources.

Quality RLFs issue loans at market or otherwise competitive and attractive rates. Many RLF studies have shown that access to capital and flexibility in collateral and terms is more important to borrowers than lower-than-market interest rates. RLF programs should be built on sound interest rate practices and not perceived as free or easy sources of financing. RLFs must be able to generate enough of an interest rate return to replenish the fund for future loan allocations, allowing for conservative default projections. With competitive rates and flexible terms, a RLF provides access to new financing sources for the borrower, while lowering overall risk for participating institutional lenders.

Eligible uses for RLF loans can include working capital, professional fees, acquisition of land and buildings, site remediation, new construction, facade and building renovation, landscape and property improvements, and machinery and equipment. Each RLF may set different eligibility guidelines, depending on the source of its funding or the goals and objectives of the fund.

2.2: Administration of Revolving Loan Funds

Initial funding, known as capitalization, for a RLF is very important. Capitalization of a RLF usually comes from a combination of public sources—local, state, and federal governments—and private ones, like financial institutions and philanthropic organizations. Understanding the potential resources available for fund capitalization is vital to developing a successful program. RLF programs must also be driven by goals and objectives that meet the needs of the community served. Identifying program standards and goals prior to seeking capitalization is critical to successful program development. The goals of a RLF program must be clearly stated and articulated to all involved throughout the process. More information on the process of capitalizing RLFs is available in Appendix 1.

It is important to determine the characteristics of loans to be offered by a RLF early in the process. Loan terms will vary according to the use of funds and the depreciation of any assets to be purchased. For

[26] See Appendix 1 for more information on sources of initial capital.

instance, a loan used for working capital may require repayment in three to five years, while a loan for equipment could last up to 10 years, and a real estate loan could last 15 to 20 years. Loan amounts for municipal funds may range from small ($1K to $10K) to midsize ($25K to $75K), with larger amounts ($100K to $250K and up) available when the borrower has secured a significant portion from private lenders or demonstrated an exceptional financial position. The amount available for lending is also dependent on the individual fund's structure and requirements. Interest is usually at a low fixed or variable rate, accounting for the repayment required to sustain the fund given a conservative estimated default rate. These are just a few of the many structural questions that need to be addressed early in development.

Administration of a successful RLF Program requires highly specialized staff with extensive financial experience. On the originating side of the office, a manager will oversee a team of loan officers, who bring corporate and real estate underwriting experience to examine potential deals and act to protect the fund's investments. Roles vary from RLF to RLF, but there is usually a small support staff to assist with up-front administrative duties such as ensuring regulatory and policy compliance, running credit reports and background checks, ensuring complete files, and providing general assistance to the manager and loan officers. Access to a strong, experienced legal team is essential to the success of a RLF. Legal specialists, internal and/or external, verify compliance with applicable lending regulations, spell out protections for the lender and obligations of the borrower within loan documents, and provide support in the event of defaults. Strong servicing and fiscal staff are also required for the administration of a RLF, though partnerships with local banks may provide an opportunity to contract some of these services. Fiscal staff process disbursements and payments, maintain reports on fund activities, monitor repayment, perform collections work, and make recommendations for policy changes.

An independent or external loan review committee is an industry best practice involving the solicitation of industry professionals to assess and recommend approval for potential loan projects. It is beneficial to have a RLF committee with broad expertise and backgrounds, and some RLF programs specify member expertise requirements for the committee. This provides a well-rounded review and assistance in areas where the RLF staff may have minimal expertise. RLF committees frequently feature members with the following backgrounds:

- Accountants
- Lawyers
- Bankers with lending background
- Local business owners

New RLF program managers need to establish policies for the review committee, such as appropriate procedures for meetings, the number that represents a quorum, and whether a unanimous or a majority vote is required for project approval. It is helpful to establish term limits for RLF committee members, as they are volunteers and motivation can wane. RLF committees must be trained on the specifics of the various programs that the organization administers. Committee members must understand clearly the programmatic and (if applicable) legislative requirements of the fund so they can act as a backstop for eligibility. It is also beneficial to educate the committee in the terminology of commercial transactions, the focus of the organization, and the components of risk.

RLFs should be designed and funded to be financially sustainable. In the U.S., however most funds are too small to fully recycle the initial capital. Many times, these funds are created without sufficient consideration for what loan size and risk portfolio is sustainable. Those considering a RLF should identify

the minimum loan fund size and key efficiencies of scale that are required to diversify risk and operate on a sustainable basis. Depending on the rate being charged for loans, a reasonable estimate is that a fund of $2M is the size needed to sustain 1.5 full time-equivalent staff members.

2.3: Revolving Loans for Contaminated Site Remediation

RLFs are a common mechanism used by public and private entities to finance contaminated site remediation. Reasons for this are straightforward: the viability of the project and its potential for return to the community are assessed before any investment is made to avoid a fruitless loss of resources, and funds are typically repaid with interest providing a financial return to the community.

On a typical site remediation or redevelopment project, the owner of the contaminated property is the applicant. There can be multiple borrowers in more complex projects, with individual lenders establishing a framework for the management of such deals. The borrowing entity (or entities) submits development plans, financial documents, and a clearly defined project scope of work to the RLF for analysis and underwriting. U.S. funds typically require a government-approved environmental site assessment to verify the degree of site contamination and estimate total project costs. Underwriting considers cash flow (from operations or the eventual sale of the site), collateral (the value of the site once remediated/redeveloped), capital (the borrower is typically required to contribute toward the project, and in some cases multiple lenders or investors are brought in for gap or contingency financing), and the ultimate character of all parties involved in the deal.

Upon approval, conditions of financing, such as job creation requirements or maximum concentrations of residual pollutants, are drawn up as covenants within the loan documents. These legally binding instruments record the debt obligation and responsibilities of both parties. Funds are then disbursed to the borrowing entity for the remediation and/or redevelopment of the contaminated site. During the period of construction, when the site produces no revenue, there may or may not be a deferment of payments to allow the borrower to focus its resources on the completion of the project. Servicing may be contracted to a traditional bank or administered in-house, to ensure payment collections, maintenance of borrower records and information, enforcement of the covenants of the loan documents, and management of collateral issues.

Though the essential components of debt finance are fairly intuitive, the actual shape of contaminated site remediation loan programs varies dramatically from one project to the next. At times a public entity at the municipal or state level may provide capital, underwriting, administration, and servicing, maintaining sole financial control of the remediation project. Loan programs can be specifically earmarked for contaminated sites or brownfields, or they can be part of a job creation, urban revitalization, or other related loan program. For larger projects, it is not uncommon to see governments at multiple levels—state, city, and national—contribute to the remediation of a significantly contaminated site. The private sector can also contribute debt financing to remediation projects, either independently or as part of a Public-Private Partnership (PPP) with related governmental entities. The public sector can leverage these private funds through a number of credit enhancement programs, strengthening areas of weakness identified by traditional lenders through indirect or conditional investments and reserves.

Debt financing can be applied toward many aspects of contaminated site remediation. Funds can target site assessment, cleanup, or professional fees for final development design. This category of investment will require additional security, as little project collateral is generated through these activities. Another potential application of loan funds entails the investment in renovations, construction, machinery and

equipment, or furniture and fixtures. These project assets can serve as collateral for the deal, and this type of project may not require supplemental security or credit enhancements. Communities typically deploy loan funds toward final development work, utilizing grant funds or developer equity for site assessment, cleanup, and professional fees.

2.4: Representative Case Studies

2.4.1: State of Washington

The State of Washington presents a successful model for site remediation revolving loan programs. The Washington Department of Commerce manages a RLF targeting urban and rural brownfields that present an immediate danger to human health and the environment.[27] Eligible applicants include government entities, site owners, and developers, provided that private sector applicants are not responsible for the initial site contamination. Loan funds do not cover pre-remediation site assessments, as site assessments form an important piece of the underwriting for these projects. Washington's interest rates are fixed "at or below the prevailing prime interest rate" and determined on a borrower by borrower basis. Loans range in size from $10K to $450K, with no listed minimum requirement for an equity contribution.

Rainier Court, an urban mixed-use district located in Seattle's Rainier Valley, leveraged under $1M in Brownfields Revolving Loan Funds from the State of Washington with city financing and multiple grants, earning the project a national award for excellence in brownfield redevelopment in 2005.[28] The seven-acre site had previously been a public health and safety concern due to illegal dumping, abandonment of vehicles, hazardous chemicals, and leaking underground storage tanks. After development, the project yielded nearly 400 units of low-income and senior housing and created an estimated 50 permanent jobs.[29]

2.4.2: Federation of Canadian Municipalities (FCM)

The Federation of Canadian Municipalities (FCM) finances studies and remediation projects with a focus on brownfields, energy, waste, water, and transportation. Contaminated site remediation projects can receive up to 80% of eligible costs through low-interest loans, with a maximum principal limit of $10M. Rates can be "as low as 1.5% below the Government of Canada bond rate for the respective terms."[30] Eligible borrowers include municipal governments, private sector development partners, and municipally-owned corporations.

In the City of Trois-Rivières, Quebec, the FCM contributed a $904K loan towards a $1.13M project to rehabilitate a former Ivaco steel plant in 2010. Over 11K tons of contaminated soil was removed from the site for offsite remediation and disposal. The city remediated and re-vegetated the site, planting over 400 trees, creating a wildlife habitat and green space for residents. Part of the site is in development to become a "technopark," providing new property tax revenues to the City of Trois-Rivières.[31]

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[27] Washington Department of Commerce (2013) *Brownfields Revolving Loan Fund: Gateway to Industrial Development.* Retrieved from www.commerce.wa.gov/Programs/Infrstructure/Brownfields-Revolving-Loan-Fund/Pages/default.aspx

[28] GeoEngineers (2013). *Rainier Court Brownfield Development.* Retrieved from www.geoengineers.com/project/rainier-court-brownfield-development

[29] Cook, D. (2006, March 30). Brownfield Project Demonstrates Seattle's Creative Know-How. *Building Green.* Retrieved from www.djc.com/news/en/11177212.html

[30] Green Municipal Fund (2011). *Green Municipal Fund Case Study: City Decontaminates Ivaco Plant Site.* Retrieved from gmf.fcm.ca/search/pdf/gmef10177_cs_en.pdf

[31] Ibid.

2.4.3: Cuyahoga County, Ohio

Cuyahoga County contains the City of Cleveland, a rust belt city with myriad brownfield sites related to early industrial activities. The county has developed a RLF to address these sites and reclaim land for future development. The Commercial Property Reutilization Fund (CPRF) was established in 1998 to provide debt financing of up to $1M for demolition, site clearance, and environmental cleanup. The maximum loan term is 10 years, with interest fixed at 4%.[32]

The City of Fairview Park received a $1M CPRF loan from the Board of County Commissioners in 2000 as part of a $1.2M project to redevelop 9.4 acres located on Lorain Road. The project involved joint land ownership, with seven parcels owned by six different property owners. The County's funds were used "to remove the asbestos and lead from three blighted, substandard motels at the site before they were razed. The County's funds were also used for the demolition."[33] The loan created two office buildings which now house 170 employees.

2.5: Debt Forgiveness

Some public lending entities forgive all or part of a company's debt obligation for site remediation projects in the event that a borrower meets certain environmental or social requirements. Fund capitalization in this case is typically not self-sustained, meaning that programs are either temporary in nature or require periodic recapitalization from public and/or private sources. Forgiveness of principal is contingent upon the borrower meeting specific objectives, such as achieving acceptable pollutant levels or job creation. Sometimes the economic condition of the surrounding community or site property values are considered when determining the rate of forgiveness. The possibility of debt forgiveness can act as an incentive for companies to meet stated objectives in an efficient manner.

Administration of forgivable loan funds mirrors that of RLFs aside from the obvious limitation of cash flow available for the lending organization's operating capital. Projects must still undergo environmental assessment and underwriting, and after approval standard servicing functions are still required. For forgivable loan programs, the company's performance against objectives must be closely monitored by the lending entity to determine eligibility for forgiveness. Due to operating budget constraints, it is rare that a program will forgive a loan in its entirety.

2.5.1: State of California

The State of California in the U.S. has a revolving loan program very similar to the State of Washington's, but with a competitive opportunity for partial debt forgiveness. Eligible sites must be contaminated specifically by either "hazardous substance release or petroleum," but other eligibility factors mirror those of Washington State.[34] Interest rates for these loans vary from 2% to 4.5% based on the length of the loan term. Loans range in size from $200K to $900K, with the borrower expected to contribute a minimum of 10% to the project. Competitive "subgrants" (forgivable portions of the debt, up to 30% with a maximum forgiveness of $200K) can be paired with RLF financing in the state

[32] Cuyahoga County Department of Development (2013). *Commercial Property Reutilization (formerly Brownfield Redevelopment Fund).* Retrieved from http://development.cuyahogacounty.us/en-us/brownfield-redevelopment-fund.aspx
[33] Cuyahoga County Department of Development (). *Brownfield Redevelopment Fund Return on Investment.* Retrieved from http://development.cuyahogacounty.us/pdf_development/en-US/Brownfield_ROI.pdf
[34] California Department of Toxic Substances Control (2008). *Fact Sheet, May 2008: California Brownfields Cleanup Revolving Loan Fund (RLF) Program.* Retrieved from http://dtsc.ca.gov/sitecleanup/brownfields/upload/final-rlf-fact-sheet78-4-08-2.pdf

of California.[35]

2.5.2: State of Massachusetts

MassDevelopment, the development finance entity of the State of Massachusetts, likewise allows for the forgiveness of certain loan funds. Criteria for forgiveness include "if the economics of the project would have warranted a grant and there is a 'forgiveness event' as defined by the successful completion of activities described in an approved application." The possibility of forgiveness therefore acts as an impetus for developers to meet their stated remediation goals within their promised timeframe.[36]

2.6: Private Loan Enhancements

Public entities frequently partner with traditional lenders such as banks and credit unions to ensure that a remediation project has access to the full amount of financing required to complete the project. As mentioned above, this can include direct co-investments through RLFs or forgivable loans. Other complementary incentives will be discussed in more detail below. A significant barrier to financing may involve the reticence of traditional lenders to consider financing a remediation project, or offering a sustainable interest rate, if it fails to meet specific underwriting criteria. In such circumstances a community may offer indirect enhancements to projects, such as collateral support, loan loss reserves, or guarantees, to mitigate the weaknesses perceived by the private financial institution.

2.6.1: Collateral Support

Collateral is a fairly typical area of weakness in regards to contaminated site remediation projects. Due to the contamination, existing property values are frequently much lower than the cost of remediation. Third-party appraisals of future property values are necessarily limited in utility and do not mitigate collateral shortfall during the period of remediation/construction. Unless the borrower has external assets in addition to the contaminated site which they are willing to pledge as collateral, traditional lenders will be unable to ensure full collateralization of their loan funds.

Collateral support programs (CSPs) cover all or a portion of a borrower's collateral shortfall, as calculated by the lending organization. The entity supplying collateral enhancement will set up a cash collateral account with the lending institution to be pledged as collateral for the project. The deposit will bear interest during the term of the loan, though the balance will be reduced periodically in line with the loan's amortization. Should the loan fall into default, the lending entity will have recourse to the entirety of funds in the cash collateral account, less any servicing or liquidation fees required by the enhancement entity.

CSPs can serve to supplement existing collateral for either private or public loans. In contaminated site remediation projects with some promise of revenue, such as a letter of intent from a current or prospective occupant, a private lender may be enticed to invest in the development of the site if provided with supplemental collateral. This reduces the direct exposure of the government to project losses while mitigating collateral risk to private lenders.

[35] California Department of Toxic Substances Control (2008). *Brownfields Cleanup Revolving Loan Fund (BCRLF): Implementation Plan/Loan Policies and Procedures Manual.* Retrieved from http://dtsc.ca.gov/sitecleanup/brownfields/upload/dtsc-loan-pp-manual.pdf

[36] MassDevelopment (2013). *Brownfields Redevelopment Fund: Fiscal Year 2012 Report.* Retrieved from www.massdevelopment.com/wp-content/uploads/2013/01/brownfields_annualreport_12.pdf

2.6.2: Loan Loss Reserve Funds

Loan loss reserve funds (LRFs) can also act as support for projects that lack an ideal investment profile. Rather than targeting a borrower's collateral shortfall, as a CSP does, LRFs target lenders' requirement to maintain a certain percentage of liquid backing for disbursed principal in the event of default. An external source of liquid capital—earmarked specifically towards a given project—can help to strengthen the deal, lower the interest rate, or provide flexibility in loan terms which would not be possible without the mitigating factor of the LRF. From a broad perspective, CSPs and LRFs are very similar and will primarily differ in the terms and nuances of banks' credit analyses.

Again, within site remediation projects, a loan loss reserve helps to mitigate risk to project lenders in the event that development plans fall through. Private lenders will have access to the LRF in the event of default, and developers will gain increased access to private money or favorable terms as a result of this factor. LRFs are another way that government can support private sector investment in contaminated industrial sites without investing directly in these high-risk, capital-intensive projects.

2.6.3: Loan Guarantee Programs

Another way that public entities can contribute to private financing of site remediation projects without direct investment is to provide guarantees for private entity loans to the property owner. Most loan guarantee programs set aside funds in a dedicated account to guarantee a given percentage of the private lender's exposure. Governments vary in their approach to underwriting such deals, with some entities reviewing the bank's underwriting and others accepting projects from preapproved lenders with little internal oversight. The length of the guarantee varies as well, with some funds remaining encumbered through the length of the private loan term and others released after a shorter period of time.

Through a guarantee, a government can stand behind a contaminated site remediation program with its fiscal reputation and project-specific monetary reserves. This encourages additional private or public investment to ensure that full project development can take place. Project completion is essential to spurring future revenue from the project site and restoring physical and economic conditions of affected communities.

2.7: Strengths/Opportunities of Loan Financing for Contaminated Site Remediation

Fund Repayment: Borrower repayment replenishes a revolving loan fund so capital is available for subsequent projects without the need for significant reinvestment. Ideally, a fund will remain sustainable in perpetuity, with no further investment required. Repayments can be applied to other brownfield projects, ensuring a constant supply of capital for distressed sites.

Legal Protection: Legally crafted documents ensure certain protections for the lender and spell out obligations of the borrower, leaving little ambiguity for future administration. Positive and negative covenants can ensure that government funds are applied appropriately toward brownfield remediation projects.

Security: Assets pledged as collateral may be liquidated and awarded to the lender to recover some or all outstanding loan funds should the borrower default on payments. For most contaminated site remediation projects, security consists of land, buildings, and any equipment or furniture located at the site under the developer's ownership. Collateral may come from assets outside the project scope, such as other buildings owned by the developer, in the event of a shortfall.

Performance Incentive: Partial or total debt forgiveness can be employed to incentivize borrowers to meet certain levels of remediation or employment surrounding the project. This may affect the overall sustainability of the fund, but can improve the efficiency and effectiveness of the borrower's remediation.

Penalties: Borrowers who fail to meet the legal requirements spelled out within the loan documents may see a higher, "default" interest rate and/or other penalties which act as incentive for the borrower to perform. Penalties may be applied, for example, should the developer fail to meet certain pollutant levels or create a minimum number of jobs at the developed site.

Industry Development: Participation in projects with multiple lenders can strengthen a municipality or state's expertise within the industry as well as broadening the network of financing available to developers of contaminated sites.

2.8: Weaknesses/Limitations of Loan Financing for Contaminated Site Remediation

Salary Expense: To administer a successful RLF program, it is essential to invest substantially in salaries to attract and retain staff and consultants with highly specialized skills. Underwriters, legal counsel, fiscal specialists and other key figures require a high level of compensation. It may also be necessary to hire environmental specialists to perform site assessments.

Servicing/Software Requirements: To ensure that loan payments are correctly applied against principal, interest, and fees, it is essential that an RLF program either identifies a quality third party to manage the fund, or invests in reliable servicing software and IT infrastructure.

Fund Planning: A significant barrier to starting a RLF lies in calculating the minimum required investment to seed the fund and provide adequate cash for operational expenses until repayment reaches a sustainable level. An organization must consider a reasonable, conservative default rate and set interest and fees to compensate for charged-off loans as well as fund administration.

Initial Investment: To set up a truly sustainable fund, a large initial investment is required. If this capital is not readily available, as through bond proceeds or government direct investment, it may not be possible to initiate the RLF. Additionally, even after inception, most RLFs are undercapitalized and require periodic injections of bond proceeds or revenues to continue operations.

Defaults: Poor planning, inexperienced staff, or bad luck can lead to substantial losses of capital through default. Despite the legal protections of collateral and guarantees, it is not uncommon for a lender to lose the majority of invested funds in any given default. Significant losses can occur from the default of several smaller sized loans over time, or one or two larger loans.

2.9: Applicability of Revolving Loan Funds to Address Contaminated Industrial Sites Globally

Revolving loan funds can be created and sustained through nearly any economic structure. Public funds may be required to capitalize a RLF, but thereafter the fund can be designed to provide a sustainable stream of revenue for the funding of future projects. Loan recipients can be public or private entities, provided that the ultimate borrower is capable of repayment. Individual project structures can be designed strategically—such as interest-only payments through construction and either a lump sum due at the sale of the property or amortization upon occupancy of the site—to suit underlying economic

conditions within a given region.

RLFs lend themselves well to the financing of contaminated sites in several ways. Publicly administered RLFs have the flexibility to set repayment terms that match the unique needs of contaminated sites: if a company remains operational, traditional amortization can apply, whereas repayment can start as far as 24 months from disbursement if the site is vacant and severely contaminated. Terms can be set to 30 or 40 years to manage cash flow, and a portion of the principal (or perhaps deferred interest) can be forgiven to meet publicly stated objectives. RLF loans are still required to be repaid, but administering governmental bodies have a great deal of flexibility in fund design and administration.

Contaminated sites may encounter difficulties by traditional underwriting standards. Regardless of economic system or geographic location, the value of the affected property comprises the collateral or security position for the loan (this can, of course, be supplemented with unrelated assets or credit enhancements, as discussed in subsection 2.6). Prior to redevelopment, property values are likely much lower than the expense required to remediate and redevelop the site. As such, valid appraisals of the anticipated future development must be used to gauge collateral. Experienced appraisers with an understanding of the local economy, construction risk, and brownfield redevelopment projects must be readily available. Another underwriting risk specific to contaminated industrial sites is the risk of improper or inadequate testing for contamination. Ethical professionals with expertise in performing environment tests are another prerequisite for any country or locality considering the implementation of a revolving loan fund for this purpose.

With a nearly universal foundational concept, RLFs are one of the most flexible tools that public entities can use to finance contaminated site remediation and redevelopment projects.

For a more concise breakdown of this tool's use and applicability for site-contaminated clean-up, refer to Appendix 2: Financing Mechanisms at a Glance, which further breaks down this tool by structural requirement, level of government and level of contamination.

Section 3: Tax Increment & Special Assessment Finance Programs

3.1: An Introduction to Tax Increment Finance

Tax Increment Finance (TIF) is a financing tool that allows local governments to invest in infrastructure and other improvements and pay for them by capturing the increase in property tax revenues (and in some areas, other types of incremental taxes) generated by the enhancements. TIF can be used to finance a variety of costs and improvements pertaining to public infrastructure, land acquisition, utilities and planning costs, and other improvements. The list of potential costs and improvements may be extensive, depending on the authorizing statute. Environmental remediation can be an explicitly approved improvement, making TIF particularly applicable to contaminated site clean-up.

In the U.S., TIF began in 1952 California and has spread throughout the country. Today, 48 states and the District of Columbia have TIF enabling legislation. While TIF has become an economic development staple in cities like Chicago and San Diego, it has grown in popularity as a prevalent financing tool in smaller and mid-sized cities such as Gahanna, Ohio and Kenosha, Wisconsin.

The first step in implementing TIF is to set the TIF district's geographic boundaries. The second step is to establish the initial assessed value of all the land within the district. A comprehensive analysis of current tax revenue from property tax, sales tax and other taxes should be conducted at this time to benchmark the current proceeds from the site. TIF generates money for a local government by capturing the tax revenue, or increment, above the initial assessed value during the life of the district. The tax increment from a TIF district is created without raising taxes and without dipping into the tax value present at the time of adoption.

Most state statutes permit the capture of incremental property tax revenue as a means to finance certain project costs. The capture of other incremental revenues, such as sales tax increment, utility tax increment and earnings tax increment is permitted by the statutes of several states. The amount of increment is determined by setting a "base" on a prescribed date prior to the development or redevelopment. In the case of property tax, the base assessed valuation is determined once the TIF plan is approved.

As new development occurs within the TIF project area, the assessed value grows. Incremental property tax revenue is the difference between the base assessed valuation and the post-development valuation. [37] For example, if a project's base assessed value was $90K, and one year after the approval of the TIF plan becomes $1M, the difference, or $910K, is the incremental valuation.

The increment becomes a repayment stream for debt used to finance project elements that will drive the increase, such as retail, commercial, residential or mixed-use development. Capturing the tax increment enables municipalities to pay for improvements without relying on other government funding or issuing other forms of debt that could put the local government's general fund at risk. TIF is attractive because TIF-generated funds must be spent to improve elements within the TIF district. Some states allow TIF funds to cross the district's boundaries, but typically only for use in contiguous TIF districts or for activities and improvements directly benefiting the TIF district.

[37] Rittner, T. (2013). Tax Increment Finance: A Success-Driven Tool for Catalyzing Economic Development and Social Transformation. *Community Development Investment Review,* 9 (1), 131.

3.2: Why TIF?

TIF has grown in popularity since the 1970s, when state and local governments experienced a decrease in federal funding for redevelopment-related activities. Spending reductions, increased restrictions on tax-exempt bonds and a major shift of urban policy to the local governments forced many communities to find more creative solutions to address redevelopment.

TIF is a popular development finance tool that is generally used to address blight, promote neighborhood stability, inspire district-oriented development and clean up contaminated sites. While each state's TIF statute is different, common policy goals and objectives exist. These intentions include blight elimination—which is discussed in nearly every state's statute—as well as infrastructure additions and improvements.

Often TIF is used to advance economic development priorities, such as:

- Guiding the use of precious public finance dollars for targeted investment and development
- Developing industry niches and opening new markets for non-existent services
- Supporting the development of a specific geographic area
- Recycling infrastructure and cleaning up brownfields
- Creating or retaining jobs and supporting industrial development

While TIF is a powerful tool that can address many needs within a community, it is most often used to encourage development, eliminate blight, and address environmental issues, as well as supporting adaptive reuse purposes.

3.2.1: Eliminate Blight

TIF was created as a tool to help remediate blight in American cities. Most state TIF statutes continue to highlight this important aspect of TIF. In fact, creating a TIF district or TIF project in most states' municipalities requires a finding of existing blight. Each state has its own way of defining blight, and, even though they differ somewhat, each is designed to address the same underlying conditions.

An examination of several states' TIF statutes indicates common conditions legislatures are trying to eliminate or address. For example, in Illinois, various factors can support a finding of blight and a certain number must be met for TIF-based redevelopment to go forward. Several targeted conditions exist nationwide as a representative sample including dilapidation, obsolescence, deterioration, failure to meet code, inadequate utilities, deleterious land use and environmental clean-up. Although each state statute differs, this list is indicative of a typical blight statute in many states.

3.2.2: Environmental Issues

Any discussion of blight includes properties with widespread environmental problems, also known as brownfields. The New York statute provides a simple, clear definition of brownfields: "any real property, the redevelopment or reuse of which may be complicated by the presence or potential presence of a contaminant."[38] Brownfields present complicated obstacles for municipalities and developers. Parties need to spend a lot of money to plan and eventually redevelop an area, and must

[38] New York Statute, ECL §27-1405

first spend a considerable amount of money making the site development ready. Soil remediation and the elimination of contaminants is a costly endeavor—but TIF can help.

3.2.3: TIF for Economic Development

TIF is frequently used as an economic development driver. If the economic performance of an area is poor, it becomes difficult to not only attract residents and business to the area, but also to maintain them. When people and businesses move out, so does their spending power. However, areas that are appealing and have a supply of jobs encourage current residents to stay and attract new growth.

Since economic development is an important objective of TIF, several communities have implemented TIF as a cornerstone of their redevelopment efforts. The following are a few examples that demonstrate TIF's ability to stimulate economic development.

3.3: TIF's Ideal Usage

TIF is most effective and least controversial when the goals are to:

- Remove severe blight
- Direct public finance resources pursuant to a community plan/policy
- Address environmental remediation
- Finance infrastructure

Many times property cannot be redeveloped without sweeping changes. Polluting property owners create land that is prohibitively expensive to rehabilitate, enhancing the value—or necessity—of public financing assistance. The common reasonableness test for TIF is nicknamed the "but for" test, which is a reference to the fact that the best usage of TIF is when the potential site improvements would not happen *but for* (without) the TIF assistance.

Infrastructure improvements are the most common and accepted ways to spend TIF-generated funds. Infrastructure refers to an area's necessary utilities and services, such as water, sewer, roads, lighting and electricity. In fact, most TIF statutes list public infrastructure improvements as an eligible TIF cost. This type of TIF cost is rarely criticized because it falls squarely within the intent of the "but for" test and is typically considered an appropriate role for government.

Adequate infrastructure is a prerequisite for private development, and TIF is commonly used to finance the necessary additions that will entice commercial developers to enter the district. Transit-oriented services, such as improvements to roads and to public transportation, are commonly the focal point of TIF districts. The BeltLine project in Atlanta, Georgia, used TIF funds to finance a 22-mile transit system that will provide unprecedented access to the city's under-served neighborhoods.

Some states' enabling statutes allow for the use of incremental revenues for additional purposes. These included non-infrastructure facilities or amenities such as police and fire stations, libraries, parks and trails, parking facilities, and convention centers. In some cases, TIF revenues may be used to make both loans and grants to projects to facilitate and assist deal financing. In most of these instances, other economic development goals need to be met, such as meeting minimum job creation levels, tax base expansion requirements or specified timeframes for capital investment.

3.4: Developing Policies for TIF Use

As TIF use grows in popularity and plays an increasingly important role in financing development projects, several communities have taken steps to develop policies and procedures for administering and determining TIF use. While these policies vary, they inherently spell out which projects qualify for TIF and help the public and developers understand TIF application. Policies show that TIF is selectively applied, and that its purpose is to generate new economic value and community benefits.

Guidelines should serve as the foundation for the sound application of TIF. Furthermore, TIF policies should clearly explain to a developer the need to demonstrate how a proposal may contribute to meeting community goals. The policies should clearly define the step-by-step TIF process.[39]

TIF can elicit an emotional, negative response by the community. These responses seem to occur more with TIF than with other public finance tools. This may be because the relationship between taxes—always a sensitive subject—and private development is clearer when "captured" for TIF than when used out of the government's general fund to capitalize other programs. Regardless of the reason, the adherence to, and communication of, well-crafted policies and guidelines is strongly encouraged. Communities that employ TIF in a transparent and deliberate manner tend to experience greater success with fewer obstacles in the way of development. The use of these policies and guidelines provide a foundation of support for local elected leaders and economic developers to use when justifying and evaluating potential projects.

3.5: Special Assessment Financing

Often, special districts may be formed to finance certain project costs. Such districts include special assessment districts, transportation districts, community improvement districts, or business improvement districts among others. While special districts are not TIF, they offer additional financing options and can be overlaid with TIF to enhance a financing package.

In the United States, most special districts can impose, by a vote of the residents or property owners within the district's boundaries, one of the following types of taxes: sales tax, property tax or special assessment. When new sales taxes and property taxes are imposed within a special district, 100% of those taxes, net of collection fees, can be contributed to paying the costs of project improvements. No "base" is excluded from the revenue stream, as happens with TIF.[40]

Special assessments cover the costs of certain improvements within a district, and are typically billed along with property taxes. The cost of the improvements is distributed among all of the properties within the district, depending on each property's share of project costs. Special assessments can be paid in a lump sum or in installments over time.

The property owner's liability for paying special assessments creates a lien, which typically has priority over all other liens on the property except for the property tax. If special assessments are not paid, the property could be sold at a tax sale. While a property tax is determined by multiplying a tax rate, or mill levy, by the assessed valuation, special assessments reflect a property's share of a project's costs. The

[39] Council of Development Finance Agencies (2008). Recommended Practices: Effective Tax Increment Finance Program Management. Retrieved from: http://www.cdfa.net/cdfa/cdfaweb.nsf/ord/recpracTIF.html/$file/Recommended_Practices_Effective_Tax_Increment_Finance.pdf

[40] Saikia, D. and Messina, M. (2013). Targeted Tools - TIF & Special Assessments. *Council of Development Finance Agencies*. Retrieved from http://www.cdfa.net/cdfa/cdfaweb.nsf/ordredirect.html?open&id=fedfc13-saikia-messina.html

amount of special assessment installment payments due each year is predetermined and is not a function of assessed value. In tax increment finance, the generation of incremental revenue requires that there be incremental assessed value growth. If a TIF project is not constructed, or its construction is delayed, TIF increment may not be available within the timeframe originally anticipated when the project was undertaken. As a result, when TIF revenues are used to support a bond issue, bondholders are subject to "construction risk," i.e., the risk that they will not receive a timely bond payment if construction is delayed.

It is becoming increasingly common for special assessments to be used as a means to mitigate such construction risk, since special assessments do not rely on assessed value growth. In some cases, TIF revenues are attached to some costs and special assessments are attached to others. However, if state statutes permit the financing of the same types of improvements using TIF or special assessments, the special assessment can cover all of the project costs. Then, to the extent that construction occurs and TIF revenues materialize, the TIF revenues can be used to reduce the amount of special assessment a property owner pays that year. Each state has different methodologies for reducing, or abating, the special assessment payment.

3.6: Revenue and General Obligation Bonds within TIF

TIF can be used to provide a revenue stream for other financing mechanisms, such as bonds, which are used to finance contaminated site remediation projects. Tax increment-backed bonds fall into the revenue bond category, and typically the sole source of security for the bonds is the tax increment revenue generated within the boundaries of the TIF district. Unlike general obligation bonds where the full faith and credit (as well as taxing authority) of the local government is pledged as security for the bonds, TIF bonds may not have a source of security beyond the incremental taxes collected in the TIF district. Similarly, TIF districts by themselves do not have independent taxing authority (absent some special tax or special assessment overlay), which further constrains their security.

In some instances, a local government may issue general obligation bonds that attempt to mimic tax increment bonds. For example, in 2005, the city of Wilmington, Delaware elected to issue general obligation bonds rather than TIF bonds to finance the construction of public improvements associated with new development at Christina Landing. The city's rationale was (1) that the difference in the cost of funds between an insured general obligation bond and a non-rated TIF bond was close to 250 basis points and (2) since the city would have been the only participant in the TIF district (as it was believed that neither the county nor the schools, the other affected taxing jurisdictions in the area, would participate in the TIF) it was in their financial interest to issue general obligation bonds rather than TIF bonds. In determining the amount of bonds to issue, the city retained a feasibility consultant to estimate future property tax dollars from the Christina Landing project and then sized bonds based on a static millage rate over 25 years. In this regard, the city attempted to determine what the incremental taxes generated by Christina Landing would be and in doing so subsidized the project in an amount equal to the present value of taxes to be generated over the 25-year life of the bonds.

This method worked for the city, but it does have implications beyond the Christina Landing project. By issuing general obligation bonds in place of TIF bonds, the city used a portion of its limited general obligation bond authorization for a private development (albeit one with important public good). But more importantly, the city transferred the risk of the project from the developer/TIF district to the voters (because had the project failed, the city's full faith and credit was still pledged).

An alternative approach to the city's general obligation bond financing might have been to issue TIF

bonds with a general obligation-backing that fades away when certain credit milestones are met; for example, when annual tax increment revenue is equal to some predetermined coverage requirement above debt service. In this regard, the city would have enjoyed the benefits of the improved interest rate on the bonds with the possibility of eliminating the general obligation backing in the future.

3.7: Representative Case Studies[41]

3.7.1: City of Dearborn, Michigan

Michigan commonly uses TIF to finance brownfields projects. As one example, the city of Dearborn used TIF to finance the cleanup and renovation of an abandoned 150K square-foot building formerly occupied by Sharon Steel.[42] Since 1922 the steel company had occupied three buildings in varying stages of dilapidation. The Sharon Steel annealing and pickling facility went bankrupt in 1989, and the company abandoned its Dearborn facilities. The property deteriorated further upon heavy use by trucking and storage entities.

In 1996, the City of Dearborn commenced redevelopment of this large, abandoned parcel. First, the city formed a commission to perform several site tests. Test results revealed significant environmental problems with the property: flooring and transformers left behind contained PCBs (polychlorinated biphenyl—toxic chemical compounds linked to cancer and birth defects) and heavy metals. Asbestos roofing and pipe wrap were also found, along with underground storage tanks containing petroleum compounds.

The property would require extensive cleaning before development of the site could take place. To finance environmental remediation and the subsequent improvements, Dearborn established a TIF district. TIF proceeds reimbursed entities who were able to make the property a safe location. Once the site was clean, the city took steps to make it a family-oriented area. The city re-zoned the property and built a school where the Sharon Steel facility once stood.

3.7.2: City of Palatine, Illinois

The Village of Palatine, Illinois also used TIF to transform an environmentally challenged area. A parcel of land in the village's downtown area had been used as a gasoline station, an automobile service station, a single family home, and a dry cleaner. The property was vacated in 1999, leaving behind decades of environmental impacts. Two years after its abandonment, an environmental assessment company declared that the property had chlorinated solvents and various other contaminants in the soil. They determined that the primary cause of this condition was leaking underground storage tanks left behind by the dry cleaning facility. The land's condition greatly hindered Palatine's redevelopment plans, as the city sought to use part of the existing foundation. To clean the soil and keep part of the foundation intact, engineers used a hydrogen-releasing compound within the soil to help eliminate the contaminant's harmful effects instead of removing the soil altogether. Further, they put safeguards in place so groundwater that may have been contaminated would be unable to leak into and affect other areas. The detection of the contaminants and subsequent remedial measures were financed, in part, by TIF. This once-contaminated property now contains 43 condominium units.

[41] These case studies, except as noted, have been adapted from a joint project, *Tax Increment Finance Best Practices Reference Guide,* produced by the Council of Development Finance Agency and the International Council of Shopping Centers.
[42] Council of Development Finance Agencies and International Council of Shopping Centers. (2007). *Tax Increment Finance Best Practices Reference Guide.* Retrieved from https://www.cdfa.net/cdfa/store2.nsf/browse.html?open&so=popularity

3.7.3: City of Denver, Colorado

Denver, Colorado used TIF to encourage development of the Stapleton project. The Stapleton TIF district, spanning 4,700-acres, was home to the Denver Municipal Airport from 1929 until 1995. Once the airport was relocated, the property languished. Municipal authorities created the Stapleton Redevelopment Project, with the goal of bringing new residences, business facilities and public parks to the site. The city relied partly on TIF funds to help achieve these goals.

The Denver City Council estimated that $93M in TIF funds would be collected and spent within the district during the 25-year life of the project. TIF funds are being used to support the infrastructure for 12K new homes, ranging from high-end homes to affordable rental homes for seniors. Additionally, 17M square-feet of commercial development is being created, enough space for 34K workers. Furthermore, the plan adds 1,700 acres of parkland for residents to enjoy. The FBI is moving its Denver offices to the Stapleton area, enticed by the TIF-assisted resurgence.

Overall, the diversity of development projects in a large area, such as Stapleton, exemplifies how TIF can help transform a neighborhood and create a diverse economy.

3.7.4: City of Chicago, Illinois

While the Stapleton area became a vacant property overnight due to the closure of the Denver Municipal Airport, a certain part of Chicago—Uptown—took many years to deteriorate from a residential and commercial hot spot to a run-down part of the city. Much like in Stapleton, TIF was adopted and used to help redevelop the area.

Uptown was a popular location prior to World War II because of its proximity to Lake Michigan, theaters and nightclubs. For a variety of reasons, the area declined in population and activity after World War II. In 2001, a redevelopment plan was created for Uptown that included the adoption of TIF. The plan targeted a 73-acre area consisting of 121 buildings, almost 90 percent of which were over 35 years old.

The City of Chicago used the TIF funds to preserve the neighborhood's historic pre-war structures and used them as the cornerstones of a mixed-use district to include residential, commercial and entertainment uses. Among the buildings within the district were the legendary Aragon Ballroom and the Uptown Theater. Over the 23-year life of the TIF district, the city will rehabilitate buildings in poor condition, improve the design and appearance of storefronts to complement the area's historic architecture and update the infrastructure.

3.7.5: City of Kansas City, Missouri

Kansas City, Missouri used TIF to help spur a $364.5M economic development project to construct new Internal Revenue Service (IRS) headquarters.[43] In 2003, the IRS decided to consolidate its paper income tax return processing to three locations: Fresno, California; Austin, Texas; and Kansas City, Missouri. The 1.14M square-foot Kansas City campus consists of three office annexes, utilizing the former main building of the Kansas City Post Office. The $364.5M project was financed by a private developer who arranged $316.5M ($30.5M in developer equity, $214M in private debt and $72M worth of other local and state financing).

An additional $48M was needed to finance the project. Kansas City adopted TIF and used it to fill the financing gap, allowing the project to proceed. The headquarters opened in 2007. This project used TIF as gap financing, which assists a developer when they have exhausted all financial resources, but still lack the money to pay for all of the project costs. Often times in these situations, the local government and the developer agree that the developer gets either a percentage of the tax increment collected, or tax increment up to a certain amount—the amount needed to completely finance the project.

3.7.6: City of Atlanta, Georgia

The 138-acre site of Atlantic Steel's former fabrication facility created a blight within Atlanta's Midtown district.[44] The City of Atlanta dedicated TIF proceeds within the district and other financing tools, such as water and sewer bonds, in combination with federal and private funds. The total development project surpassed $2B for the complete remediation and redevelopment of the site. Over $200M of this financing was raised through TIF bonds.

The final Atlantic Station project involves the creation of a dense, multi-use development focused on smart growth. Atlantic Station will ultimately feature nearly 3,700 residential units, two million square feet of retail space, over 1,200 hotel rooms, and five million square feet of office space.

Despite the successful development created to date, the finance team faced two significant challenges.[45] First, the allowable period for bond interest payment from bond proceeds under state law (18 months) was too short to generate the associated incremental tax revenues needed to pay bond interest. To compensate for this deficiency, Georgia's Redevelopment Powers Act was amended to permit interest capitalization on the bonds for up to 42 months.

Second, there was a risk that development efforts could wane over the course of the project such that the incremental tax revenues received would be insufficient to pay scheduled bond debt service. This risk could not be mitigated without private developer guarantees. Unfortunately such guarantees could jeopardize the exclusion of bond interest from federal income taxation. To enhance the creditworthiness and preserve the tax-exempt status of the bonds, the plan recommended that the city create a special district coterminous with the tax allocation bond district. As part of this arrangement, the city agreed to levy a tax on all special district taxpayers if pledged incremental tax revenues were ever insufficient to pay bond debt service. With additional security from this "generally applicable tax," rather than from private developer payment guarantees, the federally tax-exempt status of the bonds would not be affected.

3.7.7: Redford Township, Michigan

The Redford Township Medical Building is located on approximately 1-acre in Redford Township in Wayne County, Michigan. The area is a traditional commercial and residential neighborhood within the Redford Township Downtown Development Authority (DDA) District. In Michigan most DDAs, including Redford Township, are also tax increment finance districts with the ability to capture most non-school taxes. The project site was previously a gasoline station but had been underutilized.

Redevelopment plans called for a 12,000 square-foot specialized medical office building connected to the local hospital. The project would help advance the Redford Township DDA's overall development

[44] United States Environmental Protection Agency (2009). *Smart Growth: Atlantic Station (Atlantic Steel Redevelopment Project).* Retrieved from http://www.epa.gov/smartgrowth/topics/atlantic_steel.htm

[45] Paull, Evans (2010). *Tax Increment Financing and Brownfields Redevelopment.* Retrieved from

plans for the area. Due to previous land uses, contaminated soil and fill material were required to be removed and disposed of in a Type II Landfill to ready the site for construction. This dramatically increased developer expenses.

Three financing programs were used for this project, including TIF, capture of state taxes, and Brownfield Redevelopment Single Business Tax Credit (a Michigan-specific tax credit program).A TIF plan was created to allow the development project to capture the available increase in property taxes resulting from the development. The captured taxes were used to reimburse development costs for eligible activities.

No state tax dollars were required to reimburse environmental activities because the overall proportion of eligible remediation expenses was comparatively low, and the Township supported local tax capture only on these activities. The state supported non-environmental development activities because the project site was in a DDA which had already captured the majority of real local taxes. The project developer successfully obtained supplemental financing for the project, and TIF reimbursement for Eligible Activities began in 2008. Total brownfield and other financial incentives secured for this project were estimated at $363K, nearly 12% of the overall project costs.

3.7.8: Scotland TIF Efforts

In 2010 the Scottish Government passed legislation, The Non-Domestic Rating Contributions (Scotland) Amendment Regulations 2010[46] under existing provisions in the Local Government Finance Act 1992,[47] to enable local authorities to implement TIF pilots. Under the pilot program, local authorities must propose their own TIF schemes that are supported through a Business Case[48]. Each Business Case must detail the necessity to utilize TIF to deliver investment. Each proposal must demonstrate: (1) the enabling infrastructure will unlock regeneration and sustainable economic growth; (2) it will generate public sector revenues; and (3) it is capable of repaying the debt required to finance the enabling infrastructure.[49] Currently, the Scottish Government has approved several projects[50] for TIF projects and has received 16 proposals from local authorities seeking to establish TIF projects. While Scotland has yet to approve a TIF for a brownfield remediation project, the statutory authority provides potential for such investments.

3.8: Strengths/Opportunities of Tax Increment & Special Assessment Finance for Contaminated Site Remediation

Transformative Project Development Potential: TIF projects generate revenues in proportion to project scale. The greater the future estimated tax revenues for a development, the more financing can be made available through TIF. Due to the dramatic increase in property value that is expected from most brownfield redevelopment projects, future property taxes can provide backing for otherwise prohibitively expensive projects.

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[46] Scottish Government (2010). *Non-Domestic Rating Contributions Amendement Regulations 2010*. Retrieved from http://www.scotland.gov.uk/Topics/Government/Finance/18232/NDRC

[47] National Archives (2014). *Local Government Finance Act 1992*. Retrieved from http://www.legislation.gov.uk/ukpga/1992/14/introduction

[48] Scottish Government (n.d.). *Business Case*. Retrieved from http://www.scotland.gov.uk/Resource/0043/00435789.doc

[49] Scottish Government (2010). *Non-Domestic Rating Contributions Amendement Regulations 2010*. Retrieved from http://www.scotland.gov.uk/Topics/Government/Finance/18232/NDRC

[50] Scottish Futures Trust (n.d.). *Tax Increment Financing*. Retrieved from http://www.scottishfuturestrust.org.uk/our-work/funding-and-finance/tax-incremental-financing/

Stronger Credit Quality: As a targeted financing tool, TIF allows for stronger credit quality of financing due to its inherent revenue stream and relatively strong project underwriting. Property taxes beyond the baseline form a reliable, fairly predictable revenue stream.

High Potential for Public-Private Partnerships: TIF alone likely cannot finance total redevelopment, but can encourage commercial developers to enter into a blighted district, forming a partnership of investment in the community.

Adaptable Repayment Stream: TIF provides a revenue stream that can be used as it is received or that can be combined with numerous financial mechanisms to provide the underlying financing (i.e. bonds, loans, grants). This allows larger projects to utilize multiple project financing sources to increase the prospects for successful project completion.

Localized Financing Solution: By breaking the project down into a contained district, TIF allows cities/counties to directly impact site contamination remediation within their own region.

Timing Flexibility: TIF may be used to finance many stages of development, from cleanup through infrastructure improvement.

Adaptability to Site Conditions: TIF may be applied to occupied sites, but is particularly effective in addressing abandoned brownfield remediation projects. Abandoned sites typically serve no strategic importance to property owners and are less likely to be cleaned up and redeveloped without adequate incentive.

3.9: Weaknesses/Limitations of Tax Increment & Special Assessment Finance for Contaminated Site Remediation

Cumbersome Legislative Requirements: TIF requires considerable legislative/federal action and policy and the remediation of contaminated sites must be expressly approved by legislative action.

Technical Administrative Requirements: TIF can be very complex to administer and implement, requiring significant training, oversight and transparency.

Tax Revenue Requirement: TIF projects must have an underlying tax revenue stream that is collected. Property or sales tax provisions must be applicable to the site.

Lack of Project Development Flexibility: Projects of a speculative nature and those without solid development plans and financing can be very difficult to complete using this model.

Potential for Project Failure: Potential for project failure is high, as underwriting is based on future development conditions within the TIF district and final project costs or market values may differ from preliminary estimates.

Credit Enhancement: TIF underwriting frequently requires credit enhancement in the form of collateral support, loan loss reserves, guarantees, insurance, etc.

3.10: Applicability of Tax Increment Finance to Address Contaminated Sites Globally

Tax increment finance is one of the most applicable tools available for site contaminated industrial sites for many reasons. TIF is a targeted financing tool and incentive that can catalyze private investment by leveraging public contributions. The ability of a governmental unit to directly leverage public money for private engagement allows for a host of options beyond traditional financing sources.

With TIF in place, project developers can think beyond clean-up by focusing both current and future tax revenues towards paying down the costs of clean-up as well as new development. It also allows the government to direct tax revenue in a manner that targets major contamination, while incentivizing sustainability and green development.

TIF is also a performance-driven tool: future tax revenues are only generated if actual clean-up occurs. Project partners and stakeholders are held to a high level of performance and the tool affords considerable oversight, transparency and due diligence. In public finance, these elements are critical when dealing with significantly troublesome projects, such as site contaminated industrial sites.

Finally, TIF is perhaps most applicable for site contamination clean-up because it is justifiable and forward looking. TIF recognizes the deficiencies in the markets surrounding site contaminated properties and addresses the core of these issues. TIF is often used simply as a lever to catalyze interest and demand in a development site. The ability to address market forces through a relatively benign tool like TIF, allows for great potential and longer term opportunity.

For other countries to utilize TIF for the remediation of site contamination, the country must already have a property tax, sales tax, or other reliable stream of municipal income in place. Without the proceeds from these taxes, there can be no revenue stream such as TIF requires. As a country develops its TIF infrastructure, it must be cognizant of the total development to take place on the contaminated site and set into place security measures that protect against the development not taking place. Guarantees from developers, credit enhancements from state governments, reserve funds, or insurance must be sought to protect against potential losses. Legislative policy must be carefully crafted to govern the use of this tool and limit its applicability to projects which benefit the public sector. TIF is a flexible financing tool with a great deal of potential to expand brownfield remediation efforts worldwide.

For a more concise breakdown of this tool's use and applicability for site-contaminated clean-up, refer to Appendix 2: Financing Mechanisms at a Glance, which further breaks down this tool by structural requirement, level of government and level of contamination.

Section 4: Tax Credit & Incentive Programs

4.1: An Introduction to Tax Credit and Incentive Programs

A tax credit is a monetary reduction of a taxpayer's tax liability. It is different from a tax deduction, which is a reduction of a taxpayer's income subject to tax, on which the taxpayer's ultimate tax liability will be determined. Tax credits can be used to reduce federal taxes or state taxes, depending on legislative authorization.

Both tax deductions and tax credits are government subsidies used to reward or encourage certain activities (e.g., home ownership through credits for home mortgage interest, family support through child care tax credits). A wide variety of U.S. tax credits and incentives exist that can influence contaminated site clean-up including New Markets Tax Credits, Federal Historic Rehabilitation Credits, Low-Income Housing Tax Credits, Energy Tax Credits, and the Brownfield Tax Incentive. For the purpose of this report, Brownfield Tax Incentive will be most closely examined.

Ultimately a tax credit is a government vehicle designed to encourage investment in certain socially or economically favored industries or activities. Tax credits accomplish important public policy objectives by encouraging the private sector to provide social benefits through projects that probably would not be developed but for the tax credits. Many tax credit projects are located in areas with a median income significantly below that of the surrounding region. Encouraging developers to construct such projects by enabling the developers to receive compensation commensurate with the related risks encourages the development of such projects. Accordingly, tax credit programs are intended to promote "public-private" partnerships in order to accomplish the goals of governments. As illustrated above, although tax credits are available to individuals and businesses, these important public policy goals with tax credits are achieved by developing tax credit programs designed for businesses to utilize.

Tax credits, while they come in many forms, are authorized by several levels of government to implement public policy. In an effort to encourage the private sector to provide a public benefit, the initiating government allows a participating taxpayer a monetary reduction of their tax liability for investments in projects that probably would not occur but for the credits. Before a tax credit (or incentive) can be valuable, the taxpayer must have tax liability (i.e. sufficient income). Without a tax liability, a straightforward tax credit has no real value to the credit holder. Unfortunately, project developers can easily have negative income, and therefore no liability, in the early years of a project. To heighten the benefit of the credits, certain programs allow the sale of credits to other parties or allow a "refund" if the tax credit value is more than the payer's tax liability.

In the U.S., demand for financing projects with tax credits is generally competitive, and the tax credit market generally is robust. In other words, demand outpaces supply in that the number of tax credit projects submitted to state agencies and other entities responsible for making tax credit awards exceed the aggregate tax credits that are available for such purposes. However, as stated above, tax credits reduce federal tax liability and, accordingly, a key condition that must exist in order for tax credits to successfully accomplish the intended public policy outcome is the existence of federal tax liability.

4.2: Tax Credits as Financing Vehicles

As stated above, tax credit programs are designed as public-private partnerships to be used as a means to accomplish certain public policy goals by financing certain socially preferred activities. However, if tax

credit benefits were available only to project developers, the tax efficiency of the program would be severely limited, and the corresponding public policy goals may not be accomplished. Thus, the extent to which the public policy goals are accomplished through tax credit programs depend to a large degree on making tax credits generally available to any investor who anticipates ongoing tax liabilities.

Tax credits are generated through the direct development and ownership in specific projects and activities. For example, an insurance company does not directly develop affordable housing projects, so in order for the company to take advantage of available tax credits, it is necessary to structure the project in a manner by which the insurance company is an owner of the project.

4.2.1: Tax Credit Syndication

Syndication refers to combining investments in tax credits of several taxpayers into a vehicle (e.g., a fund) that, in turn, invests directly in specific tax credit projects. The fund generally specializes in the type of tax credits in which its investors want to invest, is professionally managed, and invests in a sufficient number of projects to adequately diversify its risks with respect to any particular project.

For example, instead of investing directly into a project, an insurance company invests in a syndicated tax credit investment fund that specializes in brownfield redevelopment investments and has invested in over 50 other similar projects. The insurance company purchases an interest in the fund that entitles it to tax credits generated by the various projects that, in the aggregate, provides tax credits to the insurance company.

4.3: Brownfields Tax Credits and Incentives

A growing focus of tax credit finance is environmental remediation. Most notably, brownfield tax credits have expanded in recent years. Several states, including Missouri[51] and New York,[52] have adopted brownfield clean-up and redevelopment tax credit programs, and the U.S. Environmental Protection Agency operates a federal Brownfields Tax Incentive program.[53]

The Brownfields Tax Incentive, a tax deduction, reduces an investor's tax burden by lowering the investor's taxable income. The incentive allows the investor to claim up to 100% of the eligible costs of cleaning up brownfields land as current expenses—rather than capitalizing these expenses as long-term assets. This is the only federal brownfield incentive targeted for private site owners and has worked to attract new owners to abandoned and contaminated brownfield sites. Many investors prefer such deductions, because they reduce their current income and allow them to capture the tax savings immediately, rather than waiting for a net future benefit. The incentive program, which provides an immediate incentive to offset short-term project costs, encourages the cleanup and development of polluted land.

The incentive offers considerable value, including offsetting brownfield cleanup costs, the tax advantages of remedies can be integrated into project design, and it encourages developers to pursue brownfield, infill, smart growth and vacant property strategies.

[51] For more information on Missouri's Remediation Tax Credits, visit http://www.ded.mo.gov/BCS%20Programs/BCSProgramDetails.aspx?BCSProgramID=3

[52] For more information on New York's Brownfield Cleanup Program tax credit, visit http://www.esd.ny.gov/businessprograms/brownfieldcleanup.html

[53] This credit sunset at the end of 2011 and has not been renewed. For more information on the U.S. Environment Protection Agency's Brownfield Tax Incentive, visit http://www.epa.gov/swerosps/bf/tax/index.htm

The true value of the incentive is the ability to level the economic playing field between shovel-ready and brownfield sites through the favorable tax treatment of cleanup costs. Qualified environmental cleanup costs include costs paid to abate or control a hazardous substance at a "qualified contaminated site". This can include site assessment, remedial planning, cleanup, monitoring costs; costs necessary to install an institutional or engineering control (e.g., roads, parking lots); state voluntary clean-up program (VCP) fees and associated costs; and removal of demolition debris.

The incentive can only be used on a Qualified Contaminated Site, which must be held by the taxpayer using the incentive. In some instances, long-term leases may qualify. In addition, the qualified site must meet two requirements. It must be held for use in a trade or business, for production of income, or as inventory; and it must have had release, threat of release, or disposal of a hazardous substance at or on the site. The U.S. Environmental Protection Agency defines the eligible hazardous materials, which are generally ignitable, corrosive, reactive, or toxic.

The state environmental agency must provide a statement that site meets the latter requirement. Verification that property is in the state VCP is sufficient, and all states should be able to process these in less than one month. The state does not determine whether any work has taken place; only that the brownfield exists. Sites listed or proposed for listing on the Agency's National Priorities List are not eligible for the Brownfields Tax Incentive.

4.4: Layered Financing Approaches

Tax credits are often used to fill a financing gap that exists on a project. Brownfield projects, due to the difficulty of predicting the extent of contamination, potential collateral shortfall, and the future property value of the proposed development, frequently encounter such financing gaps. Governments regularly partner with developers to achieve projects. Often tax credits are just one of multiple sources of capital contributing to a project, alongside equity, loans and other tools.

Tax credits can be an especially powerful means of financing when layered or combined with amounts from other federal, state and local funding sources. Such sources can include federal funding, tax increment finance, bond financing, public/private lending structures, foundations and contributions from charitable partners.

It should be noted that not all types of financing sources can be combined with all types of tax credits. Consultation with an experienced tax advisor is strongly recommended.

4.4.1: Leveraging and Combining Tax Credits

As discussed previously, tax credits themselves are not a direct source of financing. Typically, a tax credit project also requires leveraging or debt financing. Leverage loans can come from bank loans, tax-exempt or taxable bonds, bridge loans, sponsor loans, city or other governmental loans, and from federal programs. In the U.S., frequent leverage sources come from programs such as Community Development Block Grants and "Section 504" Small Business Administration loans. Applicability of these options for brownfield developers depends on the location and end-use of the contaminated site. Only after the tax credits are valued and monetized can tax credits be used to finance a project. Frequently, tax credits are simply converted to and become equity.

Another type of leveraging involves using tax credits to increase the amount of financing that otherwise would be available if solely non-tax credit financing were used. In this arrangement, non-tax credit financing is leveraged with tax credits to effectively increase the total project funds. Doing so permits an otherwise fixed amount of financing to be increased solely by structuring a project as a tax credit project.

4.4.2: Bonds as Leverage

The primary means of leverage for contaminated site remediation projects include direct taxable loans to project developers or bond financing through a governmental issuer acting on behalf of a private owner/operator. The issuer loans bond proceeds to the developer. Depending on the structure, use, and security, bonds can be exempt from federal and often state income taxation, which can produce a lower interest rate than can be obtained in a private loan. It is important to note however, that certain tax credits and bond finance structures may be incompatible[54]—consult with a public finance lawyer before combining these tools. Bonds are explained in greater detail in Section 2 of this paper.

Types of security include a mortgage on any existing buildings present on the brownfield or other collateral that one might expect to include in a private loan, such as machinery and equipment or furniture and fixtures. In addition, bonds are often insured or supported by liquidity or credit support from banks, insurance companies or other providers, or supported by the obligation of a larger governmental entity, such as a state or by special assessments or other revenues. The U.S. federal government also provides a number of guarantee structures through a variety of programs, including the U.S. Department of Housing and Urban Development's "Section 108" loan program.[55]

4.4.3: Tax Increment Finance (TIF) Bonds

Tax Increment Finance[56] works particularly well with tax credits targeted to low-income area development, such as for projects designed to eliminate blight, promote building rehabilitation, facilitate environmental cleanup, and encourage economic development, job creation, or affordable housing.

TIF Bonds can be used to leverage tax credits. In addition, special districts may be formed to finance certain project costs, such as site cleanup. Such districts include special assessment districts, transportation districts, community improvement districts, business improvement districts among others. While special districts are not TIF, they offer additional financing options and can be overlaid with TIF and NMTC to enhance a financing package.

As an example, a TIF district and a special assessment district are created with coterminous boundaries to support the development of a new mixed-use project eligible for tax credits on a former industrial site. While the project is in the development stage, the special assessment is used to address debt service needs until the proper amount of increment can be generated. When the project is complete and the full increment is generated, the special assessment contribution is no longer needed.

[54] In the U.S., for example, the New Markets Tax Credit program and tax-exempt Private Activity Bonds are often difficult to combine in a single project, depending on the exact financial structure and nature of the private user.
[55] U.S. Department of Housing & Urban Development (2013). *Section 108 Loan Guarantee Program.* Retrieved from http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs/108
[56] Council of Development Finance Agencies and International Council of Shopping Centers. (2007). *Tax Increment Finance Best Practices Reference Guide.* Retrieved from https://www.cdfa.net/cdfa/store2.nsf/browse.html?open&so=popularity

In this example, the special assessment is used to effectively guarantee the payment of principal and interest to bondholders, enabling the financing to be accomplished even though the tax increment and tax credits are not sufficient alone.

4.4.4: Taxable Tax-Credit Bond Programs

Tax credit bonds are taxable instruments may be issued by governments and governmental entities for a wide array of purposes. A variety tax credit bonds have existed in the U.S., including Qualified School Construction Bonds and Qualified Energy Conservation Bonds. Unlike tax-exempt bonds, where the investor is able to exclude interest from gross income on federal tax return (and on many state returns), tax credit bonds allow investors to receive a tax credit at a rate set by the government. The bond issuer maintains the responsibility to pay the principal on the bonds, and in essence, these programs provide an interest-free loan to the issuer.

In the U.S., the use of tax credit bonds was enhanced in 2008, when Congress amended the tax credit bond rules to permit tax credits to be sold separately from the related bond in what is known as "stripping" the tax credit in order to make these instruments more attractive to investors. The U.S. Congress generally authorizes specific amounts of available funds for each tax credit bond program. The formula for how the authorization is allocated is usually set for each state by the Treasury or, for some programs, the Treasury approves specific projects for which tax credit bonds will be issued.

4.5: Representative Case Studies

4.5.1: City of West Chester, Pennsylvania

Alliance Environmental is a demolition and environmental service company located in West Chester, Pennsylvania. In 1997, faced with the need for larger office and storage facilities, the company sought to expand its headquarters. The company identified a nearby, 8.5-acre property with a building that Alliance hoped to renovate. The site's former uses included a brick quarry, a landfill, and a pharmaceutical manufacturing facility, Wyeth Incorporated. Wyeth had produced penicillin in the 1970s and '80s and groundwater on the property remained contaminated from this and other activities. Before any construction could begin, Alliance would have to address the environmental cleanup issues associated with the property.

The cleanup and redevelopment process began with Alliance purchasing the property in 1998. A combination of the Federal Brownfields Tax Incentive and a local, municipal tax incentive program provided Alliance with nearly $800K in tax relief. Alliance was able to expense its cleanup costs at the end of the year and receive an injection of cash as a tax refund. Once the site was cleaned up, the existing building was renovated, and other buildings were constructed from the ground up. The site is now home to the Good Will Business Park. Income from leasing of the Business Park has enabled Alliance to expand its revenue base. The company has also expanded its scope of work from primarily asbestos abatement and demolition work to include property cleanup and redevelopment.

Alliance also made use of local tax incentives for the Good Will Business Park project. In particular, Alliance used a municipal tax extension in Chester County called LERTA, which offers a three-year abatement for increased value in property taxes. As a result, Alliance only had to pay taxes on the previously determined value of the property. Alliance was also able to use state programs to assist with brownfields restoration, which dovetailed well with the Tax Incentive. The first was the Pennsylvania Act 2 Program, which provides indemnity to the developer from liability issues; the second was the Pennsylvania Act 3 Program, which provides indemnity from liability issues to lenders.

A local bank had initially expressed concern about loaning money to Alliance due to possible environmental liability issues. The use of Pennsylvania Acts 2 and 3, along with the Federal Brownfields Tax Incentive, eased its worries about liability through clearly indemnifying the developer from liability issues and providing future cash flow enhancements through tax credits. A precedent was set within the local lending community that financing brownfields could be easier than originally perceived. Alliance has since obtained financing for other cleanup and redevelopment projects in the area. In October 2003, Alliance purchased a 13.5-acre former concrete plant. Again, the Federal Brownfields Tax Incentive was utilized to aid in the cleanup process.

4.5.2: City of Milwaukee, Wisconsin

As a local environmental engineering firm in Milwaukee, Wisconsin, J. Spear Associates advises multiple clients on the advantages of using the Federal Brownfields Tax Incentive. Among these clients was a contractor who had recently purchased a property on Martin Luther King (MLK) Drive. The approximately one-acre property was within the Historic King Drive Business Improvement District, and the contractor was looking to create a mixed-use office/residential/retail redevelopment project to coincide with the area's general revitalization. Initial assessments of the site revealed a high level of PCBs in the groundwater and some cleanup would be needed before any redevelopment could occur.

Cleanup of contamination on the site was easier than originally suspected, as tests revealed that the property's contamination had actually migrated from another site. J. Spear Associates advised its client to cap the contamination; a portion of the cap was then used as a parking area for the site. Through the Federal Brownfields Tax Incentive, the developer expensed more than $100K in cleanup costs. The site now features a dentist's office and two new apartments units.

Due in part to the efforts of brownfields stakeholders, the MLK Drive area and surrounding neighborhood are experiencing a positive transformation. Redevelopment of the formerly contaminated site on MLK Drive improved the area's business environment by providing additional commercial and sought-after urban residential space.

4.5.3: City of Lawrence, Massachusetts

The City of Lawrence, a mid-sized city on the Merrimack River in northeast Massachusetts, has an industrial history that covers more than 150 years. At the entrance to the city stands an 8.6-acre property used for industry for more than a century. Originally home to a machinery plant, the site was later used to produce textiles, rubber, and plastics. Today, the property is at the center of the Lawrence Gateway Project, a program to improve the entrance to the city which is itself part of a broader initiative to revitalize the City of Lawrence.

The site at Lawrence's gateway closed its operations in 1981, and by that time its soil and groundwater were contaminated with PCBs, solvents, oils, metals, and other industrial materials. In addition, contaminants were found to be migrating from adjacent industrial properties onto this site. Since 1987, the property's owner, GenCorp, has been working with federal, state and local government agencies and community groups to clean up and redevelop the property.

To clean up the property, GenCorp faced significant expenses related to the demolition of numerous buildings, excavation of subsurface materials and soils, temporary capping, removal of concrete slabs, the sealing of drainage pathways, and the reconfiguration of draining systems. Ultimately, cleanup and redevelopment of the site would exceed $80M.

The Federal Brownfields Tax Incentive was one of the key components of this project, allowing GenCorp to expense the costs of cleanup for each year in which they were incurred rather than having to capitalize each year's cost over multiple years. In 1998 alone, these tax advantages provided GenCorp with $2.4M in returned cash-flow.

The decision to redevelop the property into much-needed parking was a shared decision between the City of Lawrence, MassDevelopment (Massachusetts' Economic Development Authority), and community stakeholders. Because Lawrence is a dense, industrial city, there has long been a shortage of available parking; new parking, currently under construction, in this convenient location will enable neighboring institutions and industries to thrive. The plan for the GenCorp property also contains an option for a future conversion of a section of the site into a multi-story parking structure, if the demand for parking continues to grow.

4.5.4: City of San Francisco, California

In December 1995, the San Francisco Giants baseball team announced plans to build the first privately-financed Major League ballpark in more than 30 years. The China Basin Ballpark Co., LLC, a subsidiary of the Giants, identified a 13-acre former industrial property located at China Basin near downtown San Francisco. This property was adjacent to the Rincon Point-South Beach project, a 115-acre redevelopment effort focused on revitalizing a blighted portion of San Francisco's northeastern waterfront for commercial, residential, and open-space uses.

Once the 13-acre site had been selected, the China Basin Ballpark Company leased the land from the Port of San Francisco. Home to a waterfront landfill and industrial warehouses, the property was surrounded by dilapidated warehouses, cargo storage yards, abandoned buildings, crumbling piers, and unimproved streets. The site's landfill still contained waste from a coal gasification plant and other past industrial activities.

The China Basin Ballpark Company needed to address the site's environmental contamination issues before any redevelopment effort could begin. Its use of the Federal Brownfields Tax Incentive in 1999 helped the project to proceed by allowing the company to quickly recover its considerable cleanup costs. According to the Northeast-Midwest Institute, a non-profit research organization, the Federal Brownfields Tax Incentive is estimated to have returned several million dollars in cleanup expenses to the developer. Total construction costs of the new ballpark exceeded $300M. Although some were concerned that these privately-funded construction costs would hurt the Giants' franchise, the team has seen revenue increase every year since the 41,000-seat SBC Park was completed in April 2000. Ultimately, the City of San Francisco contributed $15M through tax increment financing.

Since the opening of SBC Park (now AT&T Park), the surrounding area has blossomed with restaurants, offices, and housing. Activity in the vicinity of the stadium has only increased. Light rail and open space improvements now link the area with other areas of San Francisco, and the ballpark draws crowds from throughout the Bay Area and beyond. The ballpark also spurred the redevelopment of the rest of the northern waterfront including the Ferry Building, Piers 1-5, and a new mixed-use cruise ship terminal at Piers 30-32. Eventually, redevelopment and construction projects within the entire Rincon Point-South beach area will have created more than 30,000 new jobs and housing for more than 11,000 residents.

4.6: Strengths/Opportunities of Tax Credits for Contaminated Site Remediation

Societal Benefits: As discussed above, tax credit programs promote activity in certain "favored" areas as determined by governments. These areas can include redevelopment and rehabilitation of brownfields; preservation and rehabilitation of historic structures; energy conservation and development of alternative energy sources; commercial and non-residential investment in designated low-income areas and locations; and development of affordable housing.

Source of Financing: Tax credits provide a stable, more immediate and (generally) predictable means by which the identified activities can be financed by society. Government investment yields the social benefits from the remediation of contaminated industrial sites, such as better health, a stronger local economy, and improvements to the physical landscape.

Stable Markets: Markets for tax credits can exist such that they provide a reasonably efficient means by which tax credits can be purchased and sold. These markets would allow for a wider distribution of credits, reaching developers with less access to primary markets.

Developer Incentives: As discussed above, without the economic benefits that flow to developers, many tax credit projects would not be able to be justified under traditional underwriting standards. Tax credits reduce tax expenditures, allowing more expensive brownfield remediation projects to take place.

Economic Development: Tax credit projects provide a significant means by which government encourages private and public sector investment and redevelopment activities in identified low-income and brownfield areas.

Public-Private Partnerships: Tax credit programs generally are structured as indirect public-private partnerships. At least arguably, these programs have a history of success that surpasses other direct incentive/subsidy governmental programs. In other words, governmental incentives and subsidies for brownfield remediation projects are awarded to private developers, but the applicable projects are subject to higher degrees of governmental approval and oversight.

Bank Investment: Banks and certain other lenders can receive credit if established under local legislation (e.g., such as the Community Reinvestment Act (CRA) in the U.S.) for providing financing and investment in designated low-income projects. CRA credits are available for investments for certain tax credit programs.

4.7: Weaknesses/Limitations of Tax Credits for Contaminated Site Remediation

Expense/Inefficiencies: Tax credit projects can be expensive to develop, construct, and operate. For example, tax credit projects generally require significant up-front investment by a developer in order to prepare a tax credit application and provide the necessary supporting documentation. Several studies have concluded that the average cost per unit of affordable housing constructed under the low-income housing tax credit program are more expensive than units that do not utilize tax credits.

Compliance: The ultimate penalty for failing to comply with tax credit program rules is recapture (i.e., the amount of the tax credits must be repaid to the government). In order to reduce the likelihood that non-compliance will occur, certain types of tax credit projects are subject to significant compliance monitoring requirements which can extend for 15 years or longer after a project is placed in service. Compliance

could involve reducing contaminants on an industrial site by a certain amount, or creating a specific number of jobs or housing units. Such compliance monitoring often may be duplicated by the various project stakeholders. The recapture risks (and related compliance costs) are in addition to, and not in lieu of, the "traditional" risks to which a market rate development is subject. For example, underwriting risk, performance, construction, cost of capital, credit pricing, tax losses, cash flow, unsuccessful tax credit applications, etc. In addition, tax credit projects may be subject to ongoing compliance monitoring and reporting requirements by state allocating agencies/entities, investors, banks and lenders, federal, or state tax authorities (e.g., where state tax credits have been received).

Guarantees: In order to reduce the likelihood that a tax credit project continues to comply with the various program rules, investors and lenders frequently will require a developer to provide guarantees to the effect that tax credits will not be recaptured. Such guarantees are in addition to the types of guarantees that a developer may need to provide with respect to a market rate project (e.g., construction, lease-up guarantees).

Recapture: In the event that a tax credit project fails to satisfy all of the various program requirements, federal and state tax authorities can recapture the tax credits that initially were awarded to a project. Recapture generally is pro-rated over a predefined compliance period (which can extend for up to 15 years). In addition to the tax credit amount, an interest charge will be added.

4.8: Applicability of Tax Credits to Address Contaminated Sites Globally

Existing corporate taxation regulatory framework is a prerequisite to the implementation of tax credit incentives for contaminated site remediation programs. Legislative changes must allow for the credit to take place, at either a state/province level or at the national level. Programs must be designed to ensure that adequate tax revenues remain to maintain essential services in the affected community. Governments should also implement relatively simple access to tax credit programs to ensure that developers will utilize the program and invest in the targeted social outcomes.

Once in place, tax credits present the highest potential positive outcome for site contaminated site clean-up. Tools like bonds, TIF and loan funds are certainly excellent public financing mechanisms, however, tax credits are perhaps the most accountable and affordable.

Tax credits are strictly performance based meaning developers and project partners receive virtually nothing if they do not perform. Since tax credits are awarded after clean-up, they afford for nearly flawless execution. If project developers do not preform, they do not benefit from the incentive.

Tax credits also offer perhaps the most affordable public financing alternative. Tax credits are net-positive for government. While there is a tertiary loss in tax revenue from the taxpayer's standpoint, the clean-up and remediation of contamination factors can far outweigh these costs and impacts. Contaminated industrial sites are a blight and burden on a community. They present significant financial and more importantly environmental hazards and dangers. A tax credit is a low cost, secure and nearly effortless financing mechanism for addressing these considerable challenges.

For a more concise breakdown of this tool's use and applicability for site-contaminated clean-up, refer to Appendix 2: Financing Mechanisms at a Glance, which further breaks down this tool by structural requirement, level of government and level of contamination.

Section 5: Grant Financing Programs

5.1: An Introduction to Grants

Grants are the distribution of funds to remediation projects without, in general, any requirement of repayment. They can fund 100% of project costs, but typically contribute a percentage, with the developer required to make up the difference through equity or debt financing. In many cases specific requirements are attached to grant funding, such as pollutant level thresholds and/or job creation, which may trigger a return, or "clawback," of funds in the event that such requirements are not met. Grants can be made from a public entity directly to a private developer performing remediation, or they can be made between two levels of government or between private sector entities.

Historically, brownfield remediation has been typically heavily subsidized through grants. However, direct grants to private entities are increasingly rare in some countries (e.g, the U.S.), as government budgets strain under economic conditions and public officials increasingly demand a higher return on investment. Grants from higher levels of government to lower levels, such as national to city, are common methods of seeding other contaminated site remediation financing programs, such as revolving loan programs, forgivable loan programs, or technical assistance services.

When grants are issued from one level of government to a lower level government, these grants are expected to leverage significant outside financing or funding. The U.S. Environmental Protection Agency (EPA) administers a robust and diverse set of grant funding programs, providing annual competitive sub-grants to cities/counties for leveraged brownfield clean-up programming.[57]

In these programs, administration of grant programs for the remediation of contaminated sites involves the review of an environmental site assessment and detailed redevelopment plans. The project must meet requirements, such as a technical and cost-effective approach and the developer's financial capacity to carry out the project. U.S. EPA also requires applicants to verify pollutant levels and estimate project costs. An appointed committee reviews the application and makes a determination based on project feasibility and community impact. A formal grant agreement is drawn up, which specifies the eligible uses of funds and requirements of the grantee. After the disbursement of grant funds, servicing requires less operational oversight than other forms of financing. Administrative staff usually performs annual reviews to ensure that the site developer is in compliance with all project parameters. Based on the structure of the grant program, staff may make a recommendation to claw back funds if requirements are not met.

Grants between public entities can be made directly or through a competitive process. Grant funds may be unconditional, allocated toward a specific project, or require performance standards with a risk of claw back. Common considerations for intergovernmental grant determinations include physical infrastructure need within a community, the economic need of the community, and the demonstrated or inferred effectiveness of the community's programs.

5.2 Types of Grants

5.2.1: Cash Grants

Grants are typically made in the form of cash, though grantors may release funds directly to vendors

[57] For more information on U.S. Environmental Protection Agency programs, visit http://www.epa.gov/swerosps/bf/index.html

or contractors rather than to the grant recipient in order to optimize the efficiency of funds (e.g., reduce grant administration overhead costs). Restrictions on the use of grant funds may apply, but grants are frequently preferred sources of financing for project support and working capital expenses. This is because secured financing, such as private or public sector loans, cannot finance project elements which yield no collateral.

5.2.2: Gap Grants

Many government entities provide a pool of grant funding specifically reserved to finance gaps in otherwise complete project funding. These grants cover unexpected expenses, such as the assessment and remediation of unforeseen environmental concerns, preparation for a larger funding request through other sources, and other essential costs not included in the initial project definition. As a grant, funds are not repaid and thus are likely to be insignificant overall sources of capital to a full site contamination cleanup project.

5.2.3: Technical/Professional Services

As an alternative to providing cash grants towards the assessment or remediation of brownfield sites, many municipalities provide professional support in the form of site assessments, planning assistance, technical assistance, and other necessary services. Employing or contracting professionals with a niche skill set may be expensive, but by retaining these professionals municipalities can verify and limit the cost and extent of services directly, ultimately guarding public funds more closely. Additionally, private recipients of cash grants may pay more on the private market for the same services a given community provides through maintaining specialized staff.

5.3: Clawbacks

Clawbacks, which are also called recapture, cancel or recover grant or tax incentive funds from organizations which fail to meet certain conditions within the funding contract. These penalties may be prorated based on the grantee's progress towards meeting the grant's requirements, or a full return of incentive money may be required. As a tool to reinforce the notion that the government intends to form a partnership rather than simply bankroll private projects, the clawback has seen some success. Conversely, under certain market conditions the completion of a project's stated goals may be impossible. For example, additional contaminants may be found at the site during the construction process, increasing costs to prohibitive levels for a developer. Alternately, a developer may not be able to deliver on construction job requirements or housing units if the cost of labor rises, leading to an unintended failure to comply. Under such circumstances a clawback provision can unfairly penalize a developer with otherwise good intentions.

5.4: Representative Programs

5.4.1: U.S. EPA Grant Programs

The U.S. EPA offers a variety of grants directed toward the remediation of contaminated industrial sites. Most of these grants are made to states and municipalities rather than private sector entities, and are meant to defray the expense of municipal obligations or the creation of renewable funding sources for site remediation.

Brownfields Area-Wide Planning Program: Provides government funding to recipients to conduct

research, technical assistance and training that will result in an area-wide plan and implementation strategy for key brownfield sites.[58] Planning will direct the assessment, remediation, and redevelopment of brownfields and promote area-wide revitalization. Funding is directed to specific areas affected by large or multiple contaminated sites.

Assessment Pilots/Grants: Provide funding for brownfield site remediation preparation. Funds can be used to inventory, characterize, assess, and conduct planning and community involvement related to brownfields sites.[59] The amount of funds that can be requested depends on anticipated levels and types of contaminants.

Revolving Loan Fund Grants: Capitalizes state or municipal revolving loan funds and provides subgrants for cleanup activities.[60] RLF grants are intended to provide the critical tool needed to effectively finance brownfield remediation. When loans are repaid, the loan amount is returned into the fund and re-lent to other borrowers, providing an ongoing source of capital within a community.

Cleanup Grants: Provide funds to carry out cleanup activities.[61] Grant funds may be used to address sites contaminated by a broad range of hazardous substances. A cost share, in the form of money, labor, material, or services—is required by may be waived for hardship.

Environmental Workforce Development and Job Training: Help organizations provide workforce development services to residents in waste-affected communities.[62] Residents learn environmental vocational skills that, in the long-term, reduce contamination and build more sustainable economies for communities.

Targeted Brownfields Assessment: Helps governments fully understand the nature of contamination associated with brownfields, reducing uncertainties surrounding the extent of feasible redevelopment.[63] Assessments supplement other EPA efforts by making dedicated technical assistance available at no cost to eligible communities.

5.4.2: U.S. HUD Brownfields Economic Development Initiative (BEDI)

The Brownfields Economic Development Initiative (BEDI) is administered by the U.S. Department of Housing and Urban Development on a competitive basis "to stimulate and promote economic and community development."[64] BEDI assists municipalities in carrying out the redevelopment of abandoned or underused industrial facilities affected by real or potential environmental contamination through providing no-cost financing to eligible projects. BEDI grant funds have a primary emphasis on the redevelopment of sites for economic development projects, promoting the

[58] U.S. Environmental Protection Agency (2013). *Brownfields Area-Wide Planning Program.* Retrieved from http://www.epa.gov/brownfields/areawide_grants.htm
[59] U.S. Environmental Protection Agency (2013). *Assessment Pilots/Grants.* Retrieved from http://www.epa.gov/brownfields/assessment_grants.htm
[60] U.S. Environmental Protection Agency (2013). *Revolving Loan Fund Grants.* Retrieved from http://www.epa.gov/brownfields/rlflst.htm
[61] U.S. Environmental Protection Agency (2013). *Cleanup Grants.* Retrieved from http://www.epa.gov/brownfields/cleanup_grants.htm
[62] U.S. Environmental Protection Agency (2013). *Environmental Workforce Development and Job Training.* Retrieved from http://www.epa.gov/brownfields/job.htm
[63] U.S. Environmental Protection Agency (2013). *Targeted Brownfields Assessments.* Retrieved from http://www.epa.gov/brownfields/grant_info/tba.htm
[64] U.S. Department of Housing and Urban Development (2013). *Brownfields Economic Development Initiative (BEDI).* Retrieved from http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/BEDI

increase of employment opportunities for low-and moderate-income individuals.[65]

HUD prefers to finance projects that will provide near-term results and demonstrable economic benefits to applicant communities. The agency does not prioritize projects whose scope is limited only to site acquisition or remediation without immediately planned redevelopment.[66]

5.4.3: Michigan Department of Environmental Quality: CMI Brownfield Redevelopment Grants

The State of Michigan provides brownfield redevelopment grants of up to $1M per project to public bodies such as municipalities or counties to investigate and remediate known sites of environmental contamination. As with BEDI, preferred projects include an economic redevelopment element. Calculations are made prior to a release of funds demonstrating a resulting net economic benefit for the community through job creation, private investment, and/or property tax increase. The execution of a grant agreement is required prior to draw down of funds. Eligible activities under Michigan's grant program include "environmental investigations and assessments, interim response, and due care response activities necessary for the proposed development."[67] An applicant can receive a Brownfield Redevelopment Grant and a Brownfield Redevelopment Loan in the same year, but the state will approve no more than one of either type of financing to a given community within a calendar year.

The City of Plainwell received a $1M CMI Brownfield Grant and $300K site reclamation grant to remediate and prepare the 36-acre former site of a paper mill for redevelopment.[68] While the liable private sector party financed the majority of site cleanup, these grants were directed toward demolition and site preparation in anticipation of a mixed-use development integrating light industrial uses, multi-family housing, trails, and open space.

5.4.4: State of Connecticut Brownfield Municipal Grant Program

The Connecticut Brownfield Municipal Grant Program was created to fund development projects that are "complicated by brownfields but will on completion make a significant economic impact."[69] Connecticut annually selects five communities of varying population size to receive grant funding for environmental investigation and cleanup activities. Eligible applicants for these funds include municipalities or municipal entities, and the state considers a variety of factors in selecting grant recipients.

The City of Hartford received a $2M grant from the state to assist with the remediation and redevelopment of a former horse nail factory.[70] The proposed mixed-use development on the site is projected to host 35,000 square feet of retail space and 90 housing units. Total project costs for the conversion are expected to exceed $24M.

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[65] Ibid.
[66] Ibid.
[67] Michigan Department of Environmental Quality (2013). *CMI Brownfield Redevelopment Grants (BRG).* Retrieved from http://www.michigan.gov/deq/0,4561,7-135-3311_4109_29262-151085--,00.html
[68] DEQ Brownfield Program (2011). *Brownfield Redevelopment Grant and Loan Projects: Projects Awarded Since Fiscal year 2008.* Retrieved from http://www.michigan.gov/documents/deq/deq-ess-bgl-table-recentglawards_232367_7.pdf
[69] Connecticut Office of Brownfield Remediation and Development (2013). *Brownfield Municipal Grant Program.* Retrieved from http://www.ctbrownfields.gov/ctbrownfields/cwp/view.asp?a=2620&q=416724
[70] Environmental Headlines (2013, April 17). *$10 Million Awarded to Clean Up Brownfields in Connecticut.* Retrieved from http://environmentalheadlines.com/ct/2013/04/17/10-million-awarded-to-clean-up-brownfields-in-connecticut/

5.4.5: City of Oklahoma City Brownfields Redevelopment Program

The City of Oklahoma City provides a diversity of funding sources and no-cost services to assist companies and nonprofit organizations in the identification and remediation of brownfield sites. In-kind professional assistance is offered by the city in the identification of brownfields, performing environmental assessments, consulting with various stakeholders, locating complementary funding sources, and performing a review of environmental documentation for compliance purposes.[71] Cash grants are made only to nonprofit entities, whereas professional services are made available to private landowners and developers upon request.

The Tinker Air Force Base was redeveloped with assistance from Oklahoma City's Brownfields Redevelopment Program, earning a national award for environmental redevelopment.[72] The remediation of Building 9001 at the base was the first such project to take place on a U.S. Air Force property, bringing an abandoned GM plant back into reuse.

5.4.6: Hennepin County, Minnesota Environmental Response Fund

The Environmental Response Fund (ERF) is a grant program that funds the assessment and cleanup of contaminated sites. ERF grants provide funding for a variety of activities at contaminated sites where added environmental remediation costs would otherwise prohibit site improvements or redevelopment. Sites must be demonstrated to "present a threat to human health or the environment, provide community benefit from the cleanup and lack funding from other sources." [73]

ERF grants can finance contaminated soil and groundwater assessment, cleanup, asbestos and lead-based paint evaluation, and abatement. Priority is placed on projects to be developed into public or green spaces, affordable housing, and job creation engines. Hennepin County has awarded 307 ERF grants since the program's inception, totaling nearly $45M.[74]

LifeSource, an established medical device company, received $410K from the ERF as part of a redevelopment project creating a new headquarters in north Minneapolis.[75] Grant funds were employed towards contaminated fill cleanup, demolition of existing improvements, and installation of vapor controls in order to redevelop the site on the Mississippi River.

5.5: Strengths/Opportunities of Grant Financing Programs for Contaminated Site Remediation

Low Administrative Costs: Because most grant funds do not require staff with technical expertise, nor expensive contracted services necessary for other financing mechanisms, the administration of grant funds is relatively inexpensive. In-kind brownfield site assessment services may require significant salary expense, however.

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[71] City of Oklahoma City (2013). *Brownfields Redevelopment Program.* Retrieved from http://www.okc.gov/planning/brownfields/

[72] Ockenfels, B. (2013, June 14). *Project Receives EPA Brownfields Phoenix Award.* Tinker Air Force Base. Retrieved from http://www.tinker.af.mil/news/story.asp?id=123352456

[73] Hennepin County, Minnesota (2013). *Environmental Response Fund.* Retrieved from http://hennepin.us/portal/site/HennepinUS/menuitem.b1ab75471750e40fa01dfb47ccf06498/?vgnextoid=064637a03d614210VgnVCM10000049114689RCRD

[74] Ibid.

[75] Hennepin County, Minnesota (2013). *Recently Awarded Environmental Response Fund Grants.* Retrieved from http://hennepin.us/portal/site/HennepinUS/menuitem.b1ab75471750e40fa01dfb47ccf06498/?vgnextoid=b4cc31eba2989210VgnVCM1000000b124689RCRD

Ease of Administration: Grant programs may be designed to use simple, straightforward eligibility criteria and operate on a set review and award schedule to minimize direct staff oversight. Progress toward required levels of remediation and/or job creation may be verified through third parties approved by the grantor, at the expense of the grantee, to remove any need for technical experts on staff.

Limited Complexity: Requirements of the grantee can be clearly spelled out within the grant agreement, both in the use of funds and in requirements related to brownfield remediation, enabling the recipient to manage grant requirements easily while the remediation project is underway.

Flexibility: Without repayment or security requirements, grant funds can be targeted toward uses which traditional financing would not allow due to a lack of associated collateral, such as planning, working capital, or permitting costs. These "soft costs" can be significant in a large brownfield redevelopment project.

Expended Eligibility: Though demonstrated financial and technical capacity must be demonstrated in order to receive a grant, applicants need not demonstrate traditional creditworthiness. This may broaden the pool of potential developers for the contaminated site. Of course, in order to leverage private funds, a grant recipient would likely need to demonstrate the ability to service debt of some kind.

Complementary Funding Source: Unlike RLFs, grant funding can be well-matched with any other type of financing. Grantors will not take a lien on any property, meaning that participating funders will not need to determine priority security interests on the contaminated site, existing or planned buildings, or equipment in the event of default.

Performance Measure Flexibility: A community can be flexible in its requirements for any given grantee to meet performance metrics. They can be set lower for priority contaminated sites or financially sensitive projects or higher when the party responsible for site contamination has access to greater disposable capital.

5.6: Weaknesses/Limitations of Grant Financing Programs for Contaminated Site Remediation

Unsustainability: Grants are not repaid, so grant funds must receive periodic injections of capital to allow the programs to continue. Aside from clawbacks, which are not desirable, funds will not return to the grantor.

Potential for Abuse: Depending somewhat on the method of selection of grantees, politics may influence the direction of grant funds more than other site remediation financing mechanisms. Due diligence requirements are much lower for grant projects, providing less opportunity for grantor oversight in the selection process.

Less Recipient Buy-In: Grants are seen as ideal by prospective site developers because they do not require monthly repayment expenditures or require ownership within the company, as certain other financing mechanisms may. Unless compliance is a priority for the grantor, "free money" may cause a developer to cut corners in project performance or fail to seek appropriate financing to ensure the project can be completed.

Difficult to Fully Assess Projects: Grantee selection does not typically require a full financial review of a project or the developing company. Without sufficient underwriting, the developer's need for grant

financing or ability to carry out the project may be overstated in application materials.

5.7: Applicability of Grant Programs to Address Contaminated Sites Globally

Grant programs can be implemented at any level of government, regardless of economic structure or market conditions. Grant programs can be combined with other financial mechanisms, such as revolving funds, to provide support for upfront studies or other aspects. The only caveat to the implementation of a grant program would be the lack of sustainable capital to maintain fund operations. All grant funds and administrative costs must be contributed by the grantor entity and replenished periodically. Grant programs must be carefully structured to reduce opportunities for political influence and to ensure that funds have a reasonable opportunity to target only feasible site remediation projects with a legitimate financial need. The structure of a successful grant program will depend largely on the goals and economic climate of the individual government implementing it.

For a more concise breakdown of this tool's use and applicability for site-contaminated clean-up, refer to Appendix 2: Financing Mechanisms at a Glance, which further breaks down this tool by structural requirement, level of government and level of contamination.

Section 6: Emerging Finance Models

6.1: A Review of Emerging Finance Programs for Contaminated Site Remediation

The United States is a recognized leader in public and private financing mechanisms for cleaning-up and redeveloping contaminated sites. The U.S. government has invested significantly through public policy, administrative action and directing funding to catalyze hundreds of financing programs and solutions to contaminated site remediation.

However, traditional public finance tools are not the only means to finance remediation. Beginning largely in other countries but making their way to the U.S. as well, a variety of innovative financing tools are now emerging in the economic development and site remediation industries. Generally speaking, these new models emphasize creative ownership, planning, and other land-based approaches to support the same goals addressed by traditional public finance. The most well-known of these emerging tools is the public-private partnership model of development.

6.2: Public-Private Partnerships

The definition of a Public-Private Partnership (PPP) is incredibly broad in scope, but at the simplest level it is the transfer of public services to a private sector entity towards the completion of a project.[76] The two most common types of PPP involve asset monetization, wherein the use of a public asset is transferred to a private entity in exchange for a one-time fee or future revenue stream, and infrastructure investment, where the government entity builds public infrastructure that a private sector partner needs for business operations. The latter form of PPP is frequently employed in environmental remediation projects.

A PPP scheme will typically involve many operations, including the design, build, financing, operation, and transfer.[77] In regards to design, the public entity must consider the output of the project (what standards or minimum capacity will be required) and encourage private developers to build efficiently to reduce public cost. A successful PPP should involve a turnkey contract with the private entity to ensure that the build occurs on time and within the project budget. Financing is the responsibility of the private party, though the public entity typically contributes some assistance by way of credit enhancements or creative leasing structures. The PPP will typically feature a contract dictating the period of operation of the PPP—in Europe this period is typically 20-30 years. Finally, at the end of the agreement, the asset will revert to the public party. Without the transfer of the asset, the agreement would constitute a full privatization of the asset rather than a PPP.

The first step in implementing a PPP is to identify whether the infrastructure would be better delivered through a private partner or through traditional public methods.[78] If a PPP makes sense, the public entity will usually measure the net benefits of this project among others to determine the best value for public money. The public entity will then undertake a series of preliminary studies, including supply or demand analysis, cost analysis and a preliminary environmental assessment to gauge the parameters and measure

[76] Swiecicki, P. (2012). *Taking the Mystery out of PPP.* Squire Sanders. Retrieved from http://www.cdfa.net/cdfa/cdfaweb.nsf/ordredirect.html?open&id=ip3f12-swiecicki.html.
[77] Ibid.
[78] The majority of information in this section has been condensed from an interactive website hosted by the European Investment Bank. *The EPEC PPP Guide* (2012) is a project of the European PPP Expertise Center. Retrieved from http://www.eib.org/epec/g2g/index.htm

the anticipated outcomes of the project. An assessment of project outcomes forms the basis for PPP analysis—a key difference from traditional input analysis from the public sector.

After preliminary information is gathered and initial research has taken place, another assessment is made regarding the overall value of the project as a PPP. A project should be affordable, with appropriate risk mitigation and supplemental financing in place, and provide tangible value to the community. Eurostat, the EU guiding entity for statistical integration, requires that European PPP projects standardize the debt and deficit entries on project financial statements, ensuring that projects are easily interpreted among countries.

Once preliminary research and assessments are carried out, a detailed preparation stage begins. Project teams must be drawn up, with clear divisions of responsibilities and deliverables. An advisory team should be sought to provide assistance throughout the course of the project. The team must develop a thorough project plan and a time table for the completion of each element. Usually project preparatory work involves performing more detailed studies, designing the underlying financial structure of the PPP, selecting the procurement method for each project element, selecting bid criteria, and preparing a draft PPP agreement. The depth and complexity of these preparations will vary with the extent of the project work to be performed.

Upon completion of the preparation stage, procurement begins. The bidding process usually involves its own set of steps, and an intensive, unbiased review of bidders must take place. Once a bidder is selected to carry out the PPP project, the legal agreement must be negotiated by both parties, financing agreements must be finalized, and all parties must execute a final agreement.

The project implementation period will require project management from the public entity involved in the deal. The public entity monitors the project's management, deliverables and service outputs. In any complex project, changes to the original plan must be reviewed and either approved or denied by the public entity to ensure that the project will reach completion in the most efficient manner possible. There should be a dispute resolution plan to prepare for the possibility that the project reaches a standstill, with attention paid to the forum and mediating entities involved. Upon completion of the contracted work, the public entity should assess the true output and expense of the project to measure the efficiency, cost, and effectiveness of the PPP.

6.2.1 The City of Webster, Texas and Cherokee Investment Partners

In 2006, the City of Webster, a small municipality more than 20 miles Southeast of Houston, partnered with Cherokee Investment Partners (CIP) to transform a brownfield located in the downtown district into a mixed-use development. The project encompassed a 574-acre tract in the heart of the city. As part of a risk-sharing measure and to ensure a mutually beneficial relationship, the City and CIP entered into development and utility agreements with one another. Both parties contributed significant resources to advance site plans, capital improvement plans, and financing structures. Conservative projections estimate the impact of the redevelopment project at $55 million over two decades resulting in $265 million in new property value.[79] This project is a model for sustainable growth, brownfield remediation, and economic opportunity.

6.2.2 Indianapolis Neighborhood Brownfield Initiative

[79] Giusto, B., International Economic Development Council (2005). *Edgewater: The Power of Public-Private Partnerships*. Retrieved from http://www.cherokeefund.com/pdfs/IEDC_EDJ_Journal_Winter_07.pdf

In 2001 the City of Indianapolis and Local Initiatives Support Corporation (LISC) launched the Indianapolis Neighborhood Brownfield Initiative to support brownfield assessments and redevelopment. This initiative has been extremely successful for over a decade and has invested $500,000 in more than 50 brownfield remediation projects.[80] Furthermore, the Initiative leverages existing grant and loan programs offered by the Indiana Brownfields Program for brownfield remediation. Sites receiving funding have attracted more than $25 million in follow-up investments, leading to significant public and private development.[81]

6.2.3: City of Rudolstadt, Germany[82]

The Pörz Brewery site in Rudolstadt became vacant after the brewery became insolvent, and the land was purchased by a private individual. In addition to contamination from decades of brewery operations, an additional challenge hindered site development in the form of a stream which ran through the center of the property. The process would involve significant rerouting of the waterway, traffic patterns near the site, and underlying infrastructure. Thuringia placed a recommendation for the community to voluntarily rezone the site to allow for private development to proceed unencumbered by regulations, fines, or delays in the construction of infrastructure to be returned ultimately to city ownership. Through combining private improvements with greater public infrastructure projects, Rudolstadt demonstrated the power of public-private partnerships in remediating contaminated industrial sites.

6.2.4: City of Vienna, Austria

Located in the southeastern part of the City of Vienna, the former gas storage and production facility of Gaswerks Simmering was abandoned in 1975.[83] In addition to tar, hydrocarbon, gasoline, ammonia, and sulfur pollution stemming from former industrial operations, the Gaswerks site retained residual debris from a sustained bombing attack during World War II. Developers planned a mixed-use development for the former industrial site, consisting of 620 housing units and significant retail space. The Vienna Business Agency played a large role in the redevelopment project, owning much of the land and drawing up redevelopment plans in collaboration with city planners. The VBA is a public-private collaborative including the City of Vienna, the local Chamber of Commerce, the Bank of Austria, and Erste Bank. By leading development efforts through this composite entity, the Gaswerks site was remediated and renovated, bringing a vibrant mixed-use development to southeastern Vienna.[84]

6.2.5: City of Liverpool, UK

A public-private partnership among Liverpool Vision, the Home and Communities Agency, and the Liverpool City Council spurred the largest development on Liverpool's waterfront.[85] Previously a deserted car park, the contaminated site was located in one of the most economically depressed regions of the city.[86] A £390 million investment from EU and UK partners spurred an investment into

[80] Local Initiatives Support Corporation, Indianapolis (n.d.). *Improving Urban Neighborhoods. Revitalizing Brownfields*. Retrieved from http://liscindianapolis.org/media/LISC__Program_Brownfields_FNL.pdf
[81] Ibid.
[82] State Development Corporation of Thuringia (2011). *Revitalisation of Brownfields through PPP: Contractual Organisation of the Cooperation between Public and Private Actors.* Retrieved from http://www.act4ppp.eu/pilot-projects/germany/thuringia
[83] Battle, S (2000). *Public-Private Partnerships in Brownfields Redevelopment.* Retrieved from http://www-sre.wu-wien.ac.at/neurus/battle.pdf
[84] Smith, D. (2013, April 15). Good Living in Gasometer. *The Vienna Review.* Retrieved from http://www.viennareview.net/on-the-town/city-life/stones-of-vienna/good-living-in-gasometer
[85] Kings Dock (2013). *Kings Dock.* Retrieved from http://kingsdock.com/home.aspx
[86] Retrieved from http://ec.europa.eu/environment/integration/research/newsalert/pdf/39si.pdf

the environmental remediation and development of the site into an office, retail, leisure, and community space. Over 2,000 jobs were created through the project in a community with high unemployment. EU Objective 1 funding was crucial to the development of the parcel, which would not have been obtainable if not for Liverpool's GDP (below 75% of the EU average).[87]

6.3: The Gingko Fund

A new private-sector model has emerged in northern Europe within the last decade. Initiated by the banking entity Compagnie Benjamin de Rothschild and the ecological economics advocacy organization BeCitizen, the Gingko Fund targets the acquisition, remediation, redevelopment, and lease or sale of contaminated sites in France and Belgium.[88] The Ginkgo Fund receives financial support from the European Investment Bank, leveraging public and private funds to finance brownfield redevelopment for a profit.[89] Ginkgo concentrates its efforts on small to medium sized sites with slight to moderate contamination, and redevelops properties according to strict energy efficiency standards. Ginkgo tries to maintain its holdings, through remediation and development, for no more than four years, but will lease finished properties rather than sell at a loss.

The Ginkgo Fund aims to build a diverse portfolio of small to mid-size contaminated properties in a variety of areas with attractive real estate potential.[90] The fund commits €5-15 million in equity per project and requires chemical or UXO contamination affect any acquired site. The fund estimates an average investment of €800,000 per hectare of soil remediated, indicating a high level of contamination within target properties. In contrast to most European remediation projects, where landfilling and disposal account for a majority of project expenditures, Ginkgo uses landfilling as a last resort in favor of cleaning and reusing all possible materials. Despite its concentration on strict resource management and social benefits, the fund is a profit-generating entity due to scrupulous financial assessment of all potential projects.

The Ginkgo Fund involves independent technical experts wherever possible to provide unbiased, third-party assessments of properties and prospective investments. Negotiations for land acquisition and sale are handled directly by the fund, and remediation activities are closely monitored at all times. Only efficient and proven remediation techniques are employed on Ginkgo sites, and risk is carefully managed through financial mechanisms (insurance, contracts, and guarantees) and monitoring strategies.

6.3.1: City of Burcht, Belgium

Ginkgo acquired a 1.1 hectare former petroleum storage depot site in Burcht, Belgium, near the city of Antwerp.[91] Abandoned since 1998, the site was formerly used for oil and fat production, the storage of oil products, and the storage of petroleum. Pollutants on the site included heavy metals, hydrocarbons, mineral oils, and benzene. Plans for the site involve dense residential development, fulfilling a recent master plan devised by the local government. Located on the Schelde River five kilometers from Antwerp's city center (with direct city views), the property has potential to increase substantially in value upon development. Total estimated project costs for the Burcht project top €24M, with anticipated revenues of nearly €31M.

[87] Maliene, V., Wignall, L., and Malys, N. (2012, March 1). *Brownfield Regeneration: Waterfront Site Developments in Liverpool and Cologne.* Retrieved from http://www.thefreelibrary.com/Brownfield+regeneration%3A+waterfront+site+developments+in+Liverpool...-a0292374196
[88] The Gingko Fund (2013). *Notre Mission.* Retrieved from http://www.ginkgofund.com/notre-mission/
[89] European Investment Bank (2013) *Gingko Fund*. Retrieved from http://www.eib.org/projects/pipeline/2008/20080189.htm
[90] Farber, B. (2009). *The Ginkgo Fund: General Presentation.* Retrieved from http://tbauler.pbworks.com/f/Farber_Ginko.pdf
[91] Farber, B. (2009). *The Ginkgo Fund: General Presentation.* Retrieved from http://tbauler.pbworks.com/f/Farber_Ginko.pdf

6.3.2: City of Versailles-Satory, France

Another selected Ginkgo site is located near the historic city of Versailles in France.[92] A former military shooting range site, the property is polluted with unexploded ordnance (UXO)—a category of pollution defined commonly in European countries. The project is located within a major automotive cluster, the Move'eo Cluster, composed of 127 companies and 48 research entities active in the field of automotive and public transport technology. Partnering with several automotive entities, Ginkgo intends to develop the site into office and research space for the industry. Total project costs are estimated to surpass €8M, with anticipated revenues of nearly €11M.

6.4: Site Classification, Planning, and Market Dependence

A feature of the general European approach to the development of contaminated lands lies in a focus on site assessment and planning by most national governments. These assessments clarify whether a given site merits direct financial intervention from the public sector to have a reasonable opportunity for redevelopment. This approach is best illustrated through the dedication of many European countries to compiling inventories of contaminated and abandoned sites and either categorizing or ranking the sites based on anticipated need for government incentive intervention. Similar work is now being done in the U.S. through an expansion of land banks, which enable cities and states to take ownership of abandoned or blighted properties.

Within France, a primary public sector role lies in maintaining an index of 200,000 brownfield sites and assessing redevelopment opportunities for each.[93] The Belgian region of Flanders created a cohesive land use plan, zoning former industrial sites for other land uses and spurring private investment in brownfield remediation through that mechanism.[94] CABERNET (Concerted Action on Brownfield and Economic Regeneration Network) and other European bodies dedicated to the promotion of brownfield redevelopment tend to emphasize traditional public sector functions, such as policymaking, planning, legislative restrictions, assessments, and classifications, as the government's primary tools in managing brownfields.

6.4.1: Detroit Land Bank Authority

As a result of the economic recession in the United States, Detroit, Michigan experienced significant losses in population, industry, property valuation, and city resources. This has led to the city failing to pay obligations, improve failing infrastructure, or fund desperately needed revitalization programs. Data revealed nearly 1 in every 5 residential homes were vacant, and property prices dropped by 80%.[95] There are many reports of homes being sold for a single dollar. As entire neighborhoods lie abandoned, crime rates have risen to the point that Detroit is regularly listed at the top of most dangerous cities in America.[96]

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[92] Ibid.

[93] Concerted Action for Brownfields and Economic Regeneration Network (2003). State of the Art: France. Retrieved from http://www.cabernet.org.uk/resourcefs/135.pdf

[94] Concerted Action for Brownfields and Economic Regeneration Network (2003). State of the Art: Belgium. Retrieved from http://www.cabernet.org.uk/resourcefs/130.pdf

[95] McGreal, C. (2010, May). "Detroit homes sell for $1 amid mortgage and car industry crisis." *The Guardian*. Retrieved from http://www.theguardian.com/business/2010/mar/02/detroit-homes-mortgage-foreclosures-80

[96] Fisher, D. (2013, October). "Detroit Again Tops List of Most Dangerous Cities, As Crime Rate Dips." *Forbes*. Retrieved from http://www.forbes.com/sites/danielfisher/2013/10/22/detroit-again-tops-list-of-most-dangerous-cities-but-crime-rate-dips/

Detroit's leaders have been grappling to find ways to mitigate blight, reduce crime, attract investment and turn around the city; all while facing billions of dollars in deficits. One of the most successful programs has been the Detroit Hardest Hit Fund. The Hardest Hit Fund is a spinoff program from the federal Troubled Asset Relief Program, created in 2008 to help stabilize the financial markets.[97] The Detroit Land Bank Authority, under direction of the Detroit Emergency Manager's Office, leads the Detroit Hardest Hit Fund and developed a Blight Elimination and Redevelopment Strategic Plan. The plan is supported by $52.3 million from the Hardest Hit Funds, federal grants, and Michigan State Housing Development Authority, and leverages work completed under the Detroit Works Project by directing the funds to the strongest target areas identified as part of that effort. This approach aims to eliminate blight in highly visible, marketable areas to help stabilize those neighborhoods first.

Across Detroit there are nearly 84,000 dwellings that may need to be torn down and even more if industrial properties with hazardous materials are targeted, according to the city.[98] By quickly and strategically demolishing dilapidated structures, the visibility of decay and blight is erased and as a result occupied housing values are lifted. Furthermore, as more vacant housing stock is eliminated, balance is restored to the supply and demand of the housing market as a whole, allowing the market to recover quicker than otherwise possible. The scale of this effort is unprecedented, and will prove as a model for remediating blight, if proven to be successful.

6.4.2: Brownfield Integrated Governance (BRING program)

The European Programme for Sustainable Urban Development completed a pilot stage for the BRING program—Brownfield Integrated Governance.[99] Rather than approach the condition of contaminated sites through traditional financing mechanisms, this initiative sought to integrate brownfield redevelopment financing with overall urban planning and European public policies. The goal of BRING was ultimately to assess contaminated sites from a land use perspective to determine whether planning and policy could be designed to incentivize the private sector to remediate contaminated sites without direct government investment.

The BRING program strove to standardize the economics of brownfields, which can vary tremendously from site to site in terms of value and need for government intervention. BRING classified three different levels of contaminated sites.[100] *A Sites* have a high inherent economic value and require little more than general direction on redevelopment from the local planning department. *B Sites* have development potential, but financial risks that provide a disincentive to private entity developers. Redevelopment projects of *B Sites* will require some government financial support. *C Sites* cannot be redeveloped profitably. The public sector must shoulder the greatest part of the burden on these highly contaminated and/or poorly located sites.

6.5: Applicability of Emerging Models to Address Contaminated Industrial Sites Globally

Elements of each developing model could prove applicable to countries considering the implementation of contaminated site redevelopment programs. The PPP model is growing in popularity on a global scale, and existing models from successful projects can be adapted to suit individual projects in countries

[97] United States Department of the Treasury (2013). *Hardest Hit Fund*. Retrieved from http://www.treasury.gov/initiatives/financial-stability/TARP-Programs/housing/hhf/Pages/default.aspx
[98] Gaist, T. (2014, May). "Detroit "blight" task force calls for demolition of 20 percent of city's housing stock." *International Committee of the Fourth International.* Retrieved from http://www.wsws.org/en/articles/2014/05/29/blgt-m29.html
[99] European Programme for Sustainable Urban Development (2010). *Brownfield Integrated Governance: Baseline Study—Development Stage.* Retrieved from http://urbact.eu/fileadmin/Projects/Bring_up/outputs_media/BRING-Baselinestudy_final.pdf
[100] Ibid.

throughout the world. These partnerships can mitigate public sector risk and provide efficient social and economic returns to participating communities if well planned and implemented. Private sector models like the Ginkgo Fund may arise organically in other countries, and can be promoted by governments through careful investments in these entities' funds. Finally, assessment and planning processes can spur investment in contaminated site redevelopment with very little financial investment, though care must be taken to safeguard private markets through political considerations. As communities and countries continue to implement creative redevelopment projects, a wider variety of structures will emerge for continued adaptation to countries with emerging redevelopment programs.

Appendix I: Management and Capitalization of Loan and Grant Programs for Contaminated Site Remediation

I.1: Introduction

Prior to establishing loan or grant programs to address the remediation and/or redevelopment of contaminated industrial sites, it is imperative that a public entity find sufficient capital to seed the fund in a sustainable manner. Multiple sources can be used to capitalize new loan and grant programs, and each source carries responsibilities and administrative burdens. This appendix will highlight some of the more common and beneficial sources of capital for the creation of contaminated site remediation programs.

I.2: Fund Management and Design

Loan and grant programs must be designed in very different ways. Grant funds are not expected to be repaid, which means that certain underwriting considerations can be relaxed. Loan funds do require repayment, which likewise influences the structure, processes, and policies of the administering entity. Both loan and grant fund investments must be carefully considered to ensure an appropriate, viable use of public funds. Projects must have a demonstrated ability to reach completion with existing financial resources. Aside from this basic underlying need, loan and grant programs will have different staffing, capitalization, and servicing structures.

Design of grant programs will depend largely on the community's need, available funding, and the types of contaminated site redevelopment projects occurring within the target region. Considerations for grant programs are spelled out in more detail in Section 5. Grant funds should be designed to allow for the greatest impact with the smallest possible investment over a given period of capitalization. For example, a state government in Central America could allocate $30 million (USD) to a brownfield remediation grant program over a period of 3 years. The initial capitalization can then be broken into three award cycles of approximately $10 million. Maximum award amounts can then be determined based on (1) the number of contaminated industrial sites within the region, (2) average cost of remediation projects within the region, (3) typical capital requirements of developers beyond private financing options, and (4) availability of other financial resources within the region. A better investment profile within Oaxaca could be multiple smaller projects, such as abandoned gas stations, or two to three large projects, such as former petroleum processing plants, depending on regional conditions. Management of grant programs will involve fiscal, technical/scientific, financial/real estate, compliance, and administrative staff members, though not all functions related to fund management will equate to full time personnel. Staff can be shared among other government development programs.

RLF programs must be designed with careful attention to financial sustainability and the existing legal environment for lenders. Detailed considerations for RLF design and management can be found in Section 2. Loan funds should be designed with sustainability in mind, with less focus on social impact in the design phase. To take a similar example, a medium-sized city in South America, could set up a $10 million (USD) RLF focused on contaminated site remediation. Cash outflow (loans made) and inflow (principal, interest, and fee payments from borrowers) must be carefully considered over the course of many years, according to assumptions in interest rates, term length, and anticipated default rates. The design of a hypothetical RLF would involve many factors beyond these basic points of consideration, to be determined by each individual community (usually with significant assistance from communities with existing programs and private sector consultants). The overall goal is to provide the city with a well-planned, "evergreen" source of capital for future investments in contaminated site remediation projects in

perpetuity. Financially experienced professionals must be retained to administer the RLF and manage portfolio risk, in addition to fiscal, legal, technical/scientific, compliance, and general administrative staff. Most staff members will likely be full-time, though some may be shared with other development programs within a state or municipal agency.

I.3: Governmental Mechanisms

Governments generally have two instruments for raising capital: levying taxes or issuing debt (to be paid by future taxes). Either option can provide a good source of capitalization for a brownfields RLF.

I.3.1: Taxation

A government may choose to increase existing taxes or levy new ones to shore up the capital necessary to seed a grant or loan program. Common examples of contamination-specific areas where taxes could be raised or levied include taxes on abandoned facilities, taxes on heavily polluting industries, taxes on petroleum products or dry cleaning services, or sewage/water treatment taxes. Raising taxes to capitalize a new program may lead to political controversy, but attention to the source of pollution or blight can help justify this source of seed funding.

I.3.2: Bond Issuance

As referenced within this report, the issuance of bonds to finance brownfield revolving loan funds and, to a lesser extent, grants is well documented. Where bonds are viewed as stable investment vehicles, repayment rates for issuing entities can be very low and provide a cost-effective mechanism to capitalize a new program. Bond markets must already exist within a country and/or municipality for this method of capitalization to be used, and the credit rating on bonds will dictate the cost of financing. Revenues must be available to service the debt, through RLF repayment or through a stream of tax revenues, and external tax revenues will need to be utilized to cover defaults, grants, or forgivable principal amounts.

I.4: World Bank Programs

Established in 1944, the World Bank strives to eliminate extreme poverty and foster shared prosperity on a global scale. The World Bank is a vital source of financing and technical assistance for low and middle income countries. Operating as a multilateral development bank, the scope and resources of the World Bank can assist countries with financial and technical support to develop and implement programs for contaminated site remediation.

I.4.1: Investment Project Financing [101]

Investment project financing (IPF) by the World Bank aims to promote poverty reduction and sustainable development of member countries by providing financial and related operational support to specific projects that promote broad-based economic growth, contribute to social and environmental sustainability, enhance the effectiveness of the public or private sectors, or otherwise contribute to the overall development of member states. Investment Project Financing is comprised of Bank Loans and Bank Guarantees. IPF operations focus on long-term development goals. Financing is available for goods, works and services. IPF could be used to support site remediation is various ways, such as through financial and technical support for a specific or various site-specific remediation

[101] For more information on the Investment Project Financing financial mechanism, visit the World Bank's website at www.worldbank.org.

projects, financial support to a revolving fund and/or grant mechanism for site remediation projects, or financial and technical support to develop contaminated site inventories or studies, strengthen the legal and institutional framework and capacities, develop local and/or national remediation strategies, and implement national site remediation programs..

I.4.2: Program for Results[102]

Program-for-Results Bank financing aims to promote sustainable development and improve the efficiency and effectiveness of expenditures by: (a) financing the expenditures of specific borrower development programs; (b) disbursing on the basis of the achievement of key results (including prior results) under such programs; (c) using and, as appropriate, strengthening the program systems to provide assurance that program funds are used appropriately and that environmental and social impacts are adequately addressed by such programs; and (d) strengthening, where appropriate, the institutional capacity necessary for such programs to achieve their intended results. Program-for-Results financing have expenditures, activities, and defined results, and promote sustainable development. The programs may be: (a) new or already under implementation; (b) national, subnational, multisectoral, sectoral, or sub-sectoral in scope; (c) part of broader, longer-term, or geographically larger programs; and/or (d) carried out by governmental and/or nongovernmental parties. This instrument could be used to provide partial financial support to a countries site remediation program or a part of the program.

I.4.3: Development Policy Financing[103]

The World Bank provides development policy financing ("Development Policy Financing") in the form of a policy development loan (DPL) or a policy-based Bank guarantee. This is aimed at helping a country address actual or anticipated development financing requirements that have domestic or external origins. Through development policy operations, the Bank supports a country's program of policy reforms and institutional actions that promote growth and sustainable poverty reduction. They can support institutional actions, for example, to improve the investment climate, diversify the economy, create employment, improve public finances, strengthen service delivery, promote reforms to the legal and institutional framework, and meet applicable international commitments. Development policy operations normally are developed in phases and can take place over one to three years. Development policy financing could support site remediation, for example, by linking disbursements to approval of new, or modification of existing laws or regulations on site contamination and remediation, development of inventories and establishing a priority remediation framework, establishment of institutional entity for execution of site remediation projects or programs, of establishment of necessary conditions or instruments for alternative site remediation financing mechanisms.

I.4.4: Reimbursable Advisory Services[104]

The Reimbursable Advisory Services (RAS) are an increasingly important way for the World Bank to meet emerging client demand through the provision of customized advisory services. They are a key feature in the World Bank's Knowledge Agenda and of increasing significant importance for the Bank's engagement with countries. RAS allow the World Bank to provide advisory services that the client requests and that the Bank cannot fund in full within the existing Bank budget envelope. This

[102] For more information on the Program-for-Results financial mechanism, visit the World Bank's website at www.worldbank.org/ProgramforResults.
[103] For more information on the Development Policy Loan financial mechanism, visit the World Bank's website at www.worldbank.org.
[104] For more information on the Reimbursable Advisory Services, visit the World Bank's website at www.worldbank.org.

can include traditional knowledge and advisory work as well as convening services. RAS clients can include: governments and government institutions of the Bank's member countries, including those that have graduated from the Bank; subnational governments; state-owned enterprises; nongovernmental organizations and other not-for-profit private associations (such as chambers of commerce); and multilateral institutions, including development banks and regional organizations. RAS could be used to assist in developing or enhancing a country site remediation program, developing alternative financing mechanisms for site remediation, or to perform other studies related to site remediation.

I.5: Private Foundations Sources

Many international development foundations exist to provide funding for large-scale projects that have a demonstrable impact on specific communities throughout the world. Foundations typically grant money to other entities for research, planning, and administrative purposes. With regards to contaminated site remediation, countries should focus on identifying foundations with global environmental, infrastructure, housing, or economic development missions. Foundation money may need special consideration in allocation, and funds may require separation so that each source is used for its intended purpose. For example, an environmental foundation grant may be used for remediation projects alone, and an economic development foundation grant may require job creation from redevelopment activities finances with foundation dollars. A few potential sources of foundational support are listed below.

I.5.1: The Global Environmental Facility[105]

The Global Environmental Facility (GEF) is a global partnership of 183 countries with international institutions, civil society organizations (CSOs), and the private sector. The purpose of the GEF is to address global environmental issues while supporting national sustainable development initiatives. The GEF is currently the largest public funder of projects to improve the global environment. An independently operating financial organization, the GEF provides grants for projects related to biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants.

Since beginning operations in 1991, the GEF has provided $11.5B in grants and leveraged $57B in co-financing for over 3,215 projects in over 165 countries. Through its Small Grants Programme (SGP) the GEF has disbursed more than 16,030 small grants to civil society and community based organizations, totaling $653.2M.

I.5.2: The Gates Foundation[106]

The Gates Foundation believes that investment in better sanitation improves public health and quality of life. The Foundation supports innovative development projects related to the installation of public sanitation projects. Though not directly related to brownfield redevelopment, funding from the foundation could potentially be leveraged against other public and private funds in a large scale development project with underdeveloped sanitation infrastructure.

Because the innovations supported through the Gates Foundation can be most immediately valuable in densely populated areas, the primary focus of these grants is on urban sanitation and the development of public policies that support new sanitation delivery models in cities. Grants are made

[105] For more information on the applicability of GEF to contaminated site remediation programs, visit the GEF website at www.thegef.org.
[106] For more information on the grants offered through the Gates Foundation, visit the website at http://www.gatesfoundation.org.

in five complementary areas: transformative technologies, policy and advocacy, urban sanitation markets, monitoring and evaluation, and building demand for sanitation. Technology and policy funding are the most applicable areas for contaminated site remediation projects.

I.5.3: The Ford Foundation[107]

Established in 1936, the Ford Foundation is an independent, global organization with a legacy of commitment to innovative leaders on the frontlines of social change. The foundation supports projects that promote democratic and accountable government, economic fairness, educational opportunity, freedom of expression, human rights, metropolitan opportunity, sexuality and reproductive health, and sustainable development. Additionally, the foundation also occasionally undertakes major initiatives that reflect elements of all programs.

The Ford Foundation is active on a global scale, concentrating on the promotion of economic opportunities, sustainable development, and other areas of interest that can be applied to contaminated site redevelopment projects. As with the Gates Foundation grants, funds may need to address only specific components of remediation projects, while supplemental financing is sought to achieve full capitalization of a remediation loan or grant fund.

I.6: Conclusion: Capitalization in Action

Any significant loan or grant program established to address contaminated industrial sites will be capitalized with funds from a variety of sources. It is essential for the implementing government to establish and monitor expectations for performance and administration that are linked to each funding source. Debt financing will need to be repaid through revenues of some kind. Grants may require documentation of pollutants removed, housing units or jobs created, or environmental impact on the surrounding community. Regardless of the financing mechanism, a community chosen to implement the redevelopment of contaminated sites requires active administration and oversight.

[107] For more information on the applicability of Ford Foundation grants to contaminated site remediation programs, visit the site at http://www.fordfoundation.org/.

Appendix II: Financing Mechanisms at a Glance

II.1: Bond Financing

Capitalization Sources	*Self-capitalizing*: The issuance of a bond, which entails selling debt notes to investors, creates the project capital by definition. Projects may need an external source of repayment or credit enhancement in order to become credit-worthy, which may require additional public or private funds.
Repayment Expectations	*Repayment at low interest rate*: Bond proceeds must be paid back, plus interest, to investors. Tax-exempt bonds offer low interest rates to borrowers and terms that frequently stretch beyond 10 years.
Project Types	*Large or pooled remediation projects with clear repayment stream*: Bond financing is best used when capital needs are fairly large—no less than $2-5 million. These costs could belong to a single project or to multiple projects pooled together in a single issuance. Bond financing is typically not appropriate for projects that still require significant technical assistance and planning, and is better used when redevelopment will occur in a reasonable timeframe.
Legal Authorization	*Tax-exemption requires authority of taxing government*: Bond financing can be taxable, which does not necessarily require governmental authority. Lower-cost, tax-exempt bonds must be allowable by the level of government levying the tax. Typically, national governments authorize regional or local issuers to operate, but the national government does not individually approve projects.
Investor Recourse	*Dependent upon pledged source of repayment or enhancement*: Bond financings typically involve project-specific deal structures, and the recourse for investors if a project fails is part of this structure. Most development projects will have a pledged source of revenue, such as a tax, or a credit enhancement, such as a guarantee or letter of credit. If project revenues cannot cover the repayment, these sources will be accessed to repay investors as allowed.

II.2: Loan Funds

Capitalization Sources

Requires initial public or private capitalization: Loan funds must have an initial source of capitalization from which to make the fund's first round of loans. There are many potential sources of funding. Public funds frequently tap general funds, specific tax revenues, or grants from the national government. Quasi-governmental funds may rely on specific taxes, grants from foundations or the national government, banks and community lenders, or individual investors. Loan funds can be structured so that the payments on initial loans recapitalize the fund, enabling later rounds of lending.

Repayment Expectations

Repayment at competitive rates, with some exceptions: Loan funds that wish to revolve over time should require repayment at rates on par with bank rates. Many loan funds do offer more generous terms with lower rates offered to all or some, specific customers that have projects meeting key economic development goals. Some funds offer 0% interest or convert their loans to grants if projects meet key targets, such as a predetermined number of jobs generated. Organizations must consider the trade-off between offering these time-limited benefits and maintaining an ongoing revolving loan fund.

Project Types

Remediation projects of all sizes, primarily as gap financing: Loan funds are typically used by public or public-private entities to provide gap financing—a final piece of a project's capital—rather than as a sole source of financing. This role benefits the fund structurally, as it helps to ensure that a private lender is also involved in the project and has conducted its own due diligence on the project's financials. The fund's role does not need to be small, as many funds do provide loans over $1 million. While most funds provide gap financing, this is not a requirement. Funds can be structured to finance entire projects, particularly when the site is relatively small. Funds could also provide loans for site studies when the remediation needs are not known, although the repayment for these projects may be more questionable.

Legal Authorization

Fund operator must be authorized to lend funds: The entity operating the loan fund must be legally able to (a) operate as a lender and (b) lend the type of monies that capitalized the fund. Some municipalities and countries have restrictions on who can lend money to projects, and even more governments have restrictions on the lending of public funds to private borrowers. In places where such restrictions exist, it may be possible to structure the fund as a sub-lender or guarantor of other loans to both support the project and observe the restrictions. So long as the use of funds is permitted, loan funds may be operated effectively by public, private, or quasi-public entities at any level of government.

Investor Recourse

Liquidation of collateral: Loan funds should be operated with the same seriousness as private lending. Otherwise, a fund that hopes to revolve over time may find itself facing a number of non-paying borrowers. Whatever collateral is pledged as part of the loan's terms becomes forfeit to the fund upon default and can be sold to recover losses.

II.3: Grant Program

Capitalization Sources

Requires initial and ongoing public or private capitalization: Grant programs must have a source of funding for each round of grants. Public grants are typically funded from general revenues, specific taxes, or the national government. Private grants may be funded from banks meeting community reinvestment requirements, foundations, or wealthy patrons.

Repayment Expectations

No repayment, but may include recapture provisions: By definition, grants do not require repayment. Some grant programs may require that the recipient meet certain targets, such as remediation completion or job targets. Failure to reach these targets should result in less funding if the recipient does not already have the funds or the recapture/repayment of awarded funds at a preset interest rate.

Project Types

Best-suited for technical assistance or site assessment: Grants can be used for almost any purpose, but economic development organizations will achieve the best leverage by targeting their grant programs at non-bankable, but desirable, activities. If the project could acquire a loan for the activities in question, then giving away the money through a grant is a poor decision, particularly if the grant is capitalized with public funds. Sites with complex contamination may require technical assistance that would go beyond the project's likely revenues, providing a good fit for grant funds. Because site assessment occurs before the remediation and redevelopment can be truly planned, this is an ideal activity for grant funding.

Legal Authorization

Not typically required of grant programs: Grant programs rarely require explicit legal authorization, although organizations should check for conflict of interest rules and restrictions against the use of public funds for private projects. In cases where public funds cannot be given to for-profit entities, a nonprofit may be able to directly receive the grant for the site assessment or technical assistance work. Conflict of interest, whether legally defined or not, should be considered—and avoided—when awarding grants. Any level of government may establish grant programs, but higher levels of government more often provide grants for lower levels of government to re-grant rather than granting to projects directly.

Investor Recourse

Typically non-existent, although recapture provisions or criminal charges may be included: Grants do not typically require repayment, which means that investors typically have little expectation of, or opportunity for, recourse. Grant programs with return provisions may demand funding when approved projects do not meet certain requirements. Furthermore, government-sponsored grant programs may include legal provisions for grantees that commit fraud or otherwise abuse the intended purpose of the grant funds.

II.4: Tax Increment / Assessment Financing

Capitalization Sources *Growth of tax revenues over time, possible upfront funding from bond issuance*: Tax Increment Financing (TIF) captures the increased taxes generated from a district designated for redevelopment assistance, and assessment districts generate funds through the levying of special taxes. Funds are either spent only as higher taxes are generated, or bonds are issued up front to pay redevelopment costs and future revenues are used to repay the bonds.

Repayment Expectations *Bonds, if issued, must be repaid*: Bonds issued for a district must be repaid from the new tax revenues. TIF and assessment districts may choose to finance improvements only as funds are generated, which does not require any repayment.

Project Types *Financing remediation or improvements on variety of sites*: TIF and assessment districts are flexible tools that can be structured to meet many needs. Bonds issued for district improvements can best-serve large projects with clear repayment opportunities. Pay-as-you-go districts may be able to meet smaller or more speculative redevelopment needs.

Legal Authorization *Requires approval from taxing jurisdiction*: At a minimum, TIF and assessment districts must be authorized by the governmental jurisdiction levying the captured or assessed tax. In some countries, a higher level of government may need to approve the general structure, if not specific projects. Additional restrictions may apply for funds paid to private developers.

Investor Recourse *Bond investors, if applicable, will have recourse*: If bonds are issued for the district, then the issuance documents will define the recourse for investors should the project fail to generate the anticipated tax revenues. In a structure where funds are not spent until generated, there may not be any true investor or need for recourse.

II.5: Tax Credits

Capitalization Sources

Credit programs require no capitalization; sale of credits is source of project capital: From the government's perspective, tax credits remove an obligation to pay owed taxes—the money is "spent" by the government before it is received. Therefore, tax credit programs do not require capitalization. From the project's perspective, tax credits are typically sold to investors, with the sale providing the project capital.

Repayment Expectations

No repayment unless terms of program are violated: Tax credits are not repaid to the government when the projects are operated according to program rules. Projects in violation of the credit program may be required to repay the value of the credits. Note that certain credit programs do create loans from investors to the projects (e.g., America's New Markets Tax Credits), and these loans must be repaid.

Project Types

Financing projects or assessments of any size: Tax credits are extremely flexible financing tools that can be constructed to provide large or small sums of money for broad or narrow purposes. Therefore, tax credit programs may be appropriate for any remediation project.

Legal Authorization

Taxing government must approve credits: Tax credit programs must be authorized by the government levying the creditable tax. Specific authorization is also required for the transferability of credits from project developers to investors.

Investor Recourse

Government or investors may have financial recourse, depending on program structure: Tax credits do not require repayment and therefore may not have a direct means of recourse. However, governments may recoup funds from projects that fail to meet program requirements through the use of return provisions. Similarly, investors who purchase credits that become invalidated by a project's violations may seek damages or have a specified arrangement with the project's developers. Programs should also include legal provisions for awardees that commit fraud or otherwise abuse the credits.

Appendix III: Glossary of Key Terms

Blight: Blight definitions vary among state and local jurisdictions. Blight is most often associated with dilapidation, obsolescence, deterioration, failure to meet code, inadequate utilities, environmental hazards, significant economic disinvestment and/or deleterious land use.

Brownfields: There are varying definitions of what constitutes a "brownfield". Generally, a brownfield is real property that has the known existent or perceived presence of a hazardous substance, pollutant, or contaminant.

"But for" Test: The "but for" test is a public policy tool to help ensure the proper use of TIF, and more specifically TIF financing is necessary for project success. Recognized as a best practice tool for TIF in the United States, the "but for test" also helps determine the minimum amount of financing necessary to make a project feasible.

Capitalization: The initial funds required to start or develop a financing program or specific project.

Clawbacks: Clawbacks, or recaptures, cancel or recover grant or tax incentive funds from grantees which fail to meet certain conditions within the funding contract. These penalties may be prorated based on the grantee's progress towards meeting the grant's requirements, or a full return of incentive money may be required. As a tool to reinforce the notion that the government intends to form a partnership rather than simply bankroll private projects, the clawback has seen some success.

Contamination: Generally, contamination is characterized as the introduction of undesirable, often harmful, elements into the environment or, in the instance of brownfield sites, a parcel of land. Contaminants vary among jurisdictions, commonly ranging from solvents, oils, petroleum, and heavy metals, to radioactive substances.

Credit Enhancement: Collateral, insurance, guarantee, letter of credit or other enhancements by which the borrower can access more affordable financing to make projects feasible.

Gap Financing: Financing that assists a developer when they have exhausted all financial resources, but still lack the money to pay for the entire project costs.

General Obligation Bonds: General obligation (GO) bonds, or governmental bonds, benefit the general public in contrast to private activity bonds that benefit private entities. GO bonds may be used for many public purposes (e.g., highways, schools, bridges, sewers, jails, parks, etc.). In the United States, the interest income earned by the bond holder is exempt from federal income taxes. Typically, states also exempt interest income from governmental bonds from state and local taxes.

Public-Private Partnership (PPP): There is not a broadly accepted definition for what constitutes a PPP. Generally, a PPP is an arrangement between a public entity and private sector partner. This arrangement allows projects with a public-interest to advance by sharing skills and assets of each sector to deliver a service or project in a more cost-effective or efficient manner. In addition to sharing skills and assets, project and/or program risks and rewards are shared among the parties involved.

Qualified Private Activity Bonds: Private Activity Bonds (PABs) are conduit revenue bonds issued for the benefit of private individuals or entities and can only be issued on a tax-exempt basis if they are "Qualified

PABs." The United States Internal Revenue Code permits the financing of the numerous categories of facilities as Qualified PABs, even though they may be used entirely or partially for private purposes. A number of specific categories support brownfield remediation efforts.

Remediation: The remediation or cleanup of brownfield sites includes the process of removing barriers to brownfield redevelopment. Efforts aimed at mitigating blight, contaminants, environmental hazards, economic disinvestment, and other similar activities are all remediation measures.

Revenue Bonds: A revenue bond is an excellent source of large, up-front capital and remains the most popular mechanism developed countries use to finance public-interest projects. Revenue Bonds are essentially loans with the entity issuing the bonds on the capital markets in return for cash. The cash is put into projects and the loan is repaid through project revenues, which might include taxes, assessments, fees and tolls.

Revolving Loan Fund (RLF): A RLF is a self-replenishing pool of money, utilizing interest and principal payments on active loans to issue new ones. A RLF provides access to a flexible source of capital that can be used in combination with more conventional lending sources. Often the RLF fills a gap between the amount a borrower can obtain in the private market and the amount needed for the entire project.

Site Assessments: Brownfield site assessments include activities in the predevelopment phase of a remediation project, which include inventory, background research, planning, environmental surveying, and more. Assessments provide insight to the extent of contamination, remediation costs, and feasibility.

Special Assessments: A special assessment is a property owner-approved supplemental tax levied, in addition to regularly levied taxes, on property owners within a specific geographic area to cover the costs of an agreed upon improvement. Special assessments have been levied for clean energy installations, façade improvements, security enhancements, infrastructure, marketing efforts for businesses, brownfield remediation and various other improvements.

Tax Increment Financing (TIF): TIF is a mechanism for capturing the future tax benefits of real estate improvements, in order to pay for the present cost of those improvements. TIF is generally used to channel funding toward improvements in distressed or underdeveloped areas where development would not otherwise occur, and is typically used to address blight. The base tax, or initial assessed value, is the assessed value of all the land and property within the district, prior to any improvements or enhancements. The difference between the assessed value when all improvements are complete and the original base tax, is used as the revenue stream to repay debts or fund ongoing improvements.

Appendix IV: References & Additional Reading

The following list of additional resources includes all of the items that are cited in this report as well as items that will be useful for additional research. Readers interested in identifying materials used in the report can use the footnotes and find expanded references below. Publications with particular utility are identified by italicized comments below.

IV.1: General Resources

Adair, A., Berry, J., & McGreal, S. (2003). Financing property's contribution to regeneration. *Urban Studies*, *40*, 1065-1080.

Association of Metropolitan Planning Organizations, Smart Growth Network. (2000). *Redeveloping Brownfields with Federal Transportation Funds*. Retrieved from http://www.ampo.org/assets/library/5_brownfields.pdf

Bartsch, C. (2002). Financing brownfield cleanup and redevelopment. *Government Finance Review*, *18*, 1. **An article focused on barriers to brownfield reuse, public sector role for redevelopment, financing resources and various governmental-level approaches,*

Bartsch, C., Paull, E. Northeast-Midwest Institute. (2008). *Case Study of State Incentives: Proposals to Make Strategic Investments in Brownfields Redevelopment*. Retrieved from http://www.nemw.org/images/stories/documents/StateBrownfieldsIncentivesCaseStudy.pdf **This report explores how states can expand and accelerate brownfield redevelopment, even with limited funds. Various support tools are recommended for different stages of development.*

Bartsch, C., Wells, B. (2005). Northeast-Midwest Institute. *State Brownfield Financing Tools and Strategies*. Retrieved from http://www.nemw.org/images/stories/documents/BFStateFinTools.pdf **This report describes examples of successful state tools and strategies that have been implemented to bolster brownfield redevelopment, and complement existing financing tools.*

Burnstein, J.D. (1997). *Capitulo 6: Instrumentos Economicos* (Spanish). Retrieved from http://www.bvsde.paho.org/bvsacd/scan/033446/033446-06.pdf

Char, C., Ricci, K., Sugarman, A. (2006). *Funding Brownfield Redevelopment: Interpreting and making sense of multi-level state funding*. Rockefeller Center at Dartmouth College. Retrieved from http://rockefeller.dartmouth.edu/library/brownfield.pdf

Colorado State University with the Collaboration of Development Research Partners. (n.d.). *Westwood Neighborhood Brownfield Redevelopment Opportunities: A Template for Evaluating Brownfield Site Potential*. Retrieved from http://www.colostate.edu/programs/CRCE/projects-pubs/envir-nr/final-report.pdf

Congreso Nacional del Medio Ambiente. (2008). *Suelos Contaminados* (Spanish). Retrieved from http://digital.csic.es/bitstream/10261/23499/1/CONAMA09.%20GrupoTrabajo.SuelosContaminados_final.pdf

Cordato, R. (2001). *The Polluter Pays Principle: A Proper Guide for Environmental Policy*. Retrieved from http://iret.org/pub/SCRE-6.PDF

Goodstein, M., Lynch, A., Trinward, K. (2011). Environmental Practice 13. *Pushing the Envelope on Brownfield Remediation: Strategies and Case Studies That Maximize Limited Resources through Alternative Funding Sources*. Retrieved from http://www.cdfa.net/cdfa/cdfaweb.nsf/ordredirect.html?open&id=research-brownfields-goodstein.html **This article discusses redevelopment strategies involving complicated brownfield sites and two case studies that maximized limited resources through alternative financing sources.*

Haninger, K., Ma, L., Timmins, C. (2012). Duke Environmental Economics Working Paper Series. *Estimating the Impacts of Brownfield Remediation on Housing Property Values*. Retrieved from http://sites.nicholasinstitute.duke.edu/environmentaleconomics/files/2013/01/WP-EE-12-08.pdf

Hanson, J., Wernstedt, K. (2009). *Research Article: Community Revitalization Through Areawide Brownfield Regeneration, Community Land Trusts, and Progressive Finance*. Environmental Practice Volume 11 Issue 3. Retrieved from http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=6383388

ICF International. (2007). *Financing Brownfields: State Program Highlights*. Retrieved from http://www.stateinnovation.org/Research/Transportation,-Infrastructure,-Smart-Growth/Brownfield-Development/finan_brownfields_epa_print.aspx

Kurdila, J., & Rindfleisch, E. (2007). Funding opportunities for brownfield redevelopment. *BC Envtl. Aff. L. Rev.*, *34*, 479.

Wernstedt, K., Meyer, P. B., & Yount, K. R. (2003). Insuring redevelopment at contaminated urban properties. *Public Works Management & Policy*, *8*(2), 85-98.

Meyer, P., Yount, K. (1999). Northern Kentucky University, University of Louisville. *Environmental Insurance and Public Sector Brownfields Programs: Factors Affecting Pursuit of Insurance as a Redevelopment Tool*. Retrieved from http://www.brownfieldstsc.org/pdfs/meyeryou.pdf

Yount, K. R., & Meyer, P. B. (1999). Project scale and private sector environmental decision making: Factors affecting investments in small-and large-scale brownfield projects. *Urban Ecosystems*, *3*(2), 179-193.

National Association of Counties. (2008). *Federal Funding Programs for Brownfields and Abandoned Site Redevelopment – Past, Present and Future: A Primer for County Officials*. Retrieved from http://www.naco.org/programs/csd/Green%20Government%20Documents/SLU_Report%20-%20Federal%20Funding%20Programs%20for%20Brownfields%20and%20Abandoned%20Site%20Redevelopment.pdf

National Association of Local Government Environmental Professionals, Northeast-Midwest Institute. (2005). *Unlocking Brownfields – Keys to Community Revitalization*. Retrieved from http://www.greenbiz.com/sites/default/files/document/CustomO16C45F63039.pdf

National Environment Protection Council. (2013, April 11). National Environment Protection Assessment of Site Contamination Amendment Measure. Retrieved from http://www.comlaw.gov.au/Details/C2014C00140 www.comlaw.gov.au

New York State Department of Environmental Conservation. (n.d.). *Brownfield Redevelopment Toolbox: A Guide to Assist Communities in Redeveloping New York State's Brownfields*. Retrieved from http://www.dec.ny.gov/docs/remediation_hudson_pdf/bftoolbox.pdf
**This resource provides a comprehensive review of brownfield redevelopment processes and examples of tools New York utilizes to support different phases of brownfield projects.*

Northern Kentucky University, University of Louisville. (2005). *Brownfields Insurance for Public Sector-Led Development Projects: Experience and Methods*. Retrieved from http://www.epa.gov/region4/brownfieldstoolkit/funding/environmentalinsurance.pdf

Rittner, T. (2011). *Brownfields 2011 – Tax Increment Finance, Tax Credits & Creative Financing*. Retrieved from http://www.cdfa.net/cdfa/cdfaweb.nsf/ordredirect.html?open&id=brownfields11creative.html
**This presentation provides an understanding of how development finance tools and tax treatments can affect brownfields redevelopment. Targeted financing tools such as tax increment financing, special district financing and tax credits are among the highlighted tools.*

Saucedo, U., Dipl. Ing. (2002). *Modelos de financiamiento para la remediacion de sitios contaminados y su viabilidad para Mexico* (Spanish). Retrieved from http://www.semarnat.gob.mx/archivosanteriores/temas/gestionambiental/Materiales%20y%20Actividades%20Riesgosas/sitioscontaminados/GTZ/F-Modelos%20de%20financiamiento%20para%20la%20remediacion%20de%20SC.pdf

This resource examines diverse international initiatives, projects, and policies used to address brownfield remediation barriers in countries with varying governmental processes, tax structures, and challenges.

State of Colorado, Department of Public Health and Environment. (2005). *The Colorado Brownfields Handbook: A Local Government Guide to Site Reuse and Economic Redevelopment*. Retrieved from http://www.colorado.gov/cs/Satellite?blobcol=urldata&blobheadername1=Content-Disposition&blobheadername2=Content-Type&blobheadervalue1=inline%3B+filename%3D%22Colorado+Brownfields+Handbook.pdf%22&blobheadervalue2=application%2Fpdf&blobkey=id&blobtable=MungoBlobs&blobwhere=1251731977908&ssbinary=true

Stephenson, J. (2005). United States Government Accountability Office. *Brownfield Redevelopment – Stakeholders Cite Additional Measures That Could Complement EPA's Efforts to Clean Up and Redevelop Properties*. Testimony Before the Subcommittee on Federalism and the Census, Committee on Government Reform, House of Representatives. Retrieved from http://www.gao.gov/assets/120/111455.pdf

Swarthmore College. (2009). Brownfields Remediation in Delaware County, PA. Environmental Studies Capstone Seminar. Retrieved from http://www.swarthmore.edu/Documents/academics/es/BrownfieldsReport.pdf

United States Conference of Mayors. (2010). *Brownfields Redevelopment: Reclaiming Land, Revitalizing Communities – A compendium of Best Practices*. Retrieved from http://usmayors.org/pressreleases/uploads/november2010bestpractices.pdf

This report is a compilation of best practices and case studies for brownfields redevelopment. The case studies profile diverse projects and highlight the economic and environmental impacts.

United States Conference of Mayors. (2010). *Recycling America's Land. A National Report on Brownfields Redevelopment (1993-2010)*. Retrieved from http://www.usmayors.org/pressreleases/uploads/November2010BFreport.pdf

United States Environmental Protection Agency, Office of Brownfields and Land Revitalization. (2011). *State Brownfields and Voluntary Response Programs: an Update from the States*. Retrieved from http://epa.gov/brownfields/state_tribal/update2011/bf_states_report_2011.pdf

United States Environmental Protection Agency, Office of Solid Waste and Emergency Response. (2012). *Evaluation of the Brownfields Program*. Retrieved from http://www.epa.gov/brownfields/pdfs/Brownfields-Evaluation-Parts-I-II.pdf

United States Environmental Protection Agency. (2011). *Brownfields Federal Programs Guide*. Retrieved from http://epa.gov/brownfields/partners/2011_fpg.pdf

United States Environmental Protection Agency. (2012). *RE-Powering America's Land – Potential Advantages of Reusing Potentially Contaminated Land for Renewable Energy*. Retrieved from http://www.epa.gov/renewableenergyland/docs/contaminated_land_resuse_factsheet.pdf

United States Environmental Protection Agency. (2013). *Brownfields Program Accomplishments*. Retrieved from http://www.epa.gov/brownfields/overview/bf-monthly-report.html

United States Environmental Protection Agency. (2013). *Brownfields Road Map to Understanding Options for Site Investigation and Cleanup 5th edition*. Retrieved from http://www.brownfieldstsc.org/roadmap/pdf/BrownfieldsRoadMapEPA542-R-12-001.pdf

Whitney, H. (2003). Cities and superfund: Encouraging brownfield redevelopment. *Ecology LQ*, *30*, 59.

World Bank, Europe and Central Asia Region, Sustainable Development Department. (2010). *The Management of Brownfields Redevelopment – A Guidance Note*. Retrieved from http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/brownfields.pdf?resourceurlname=brownfields.pdf

World Bank World Bank (2014). Developing a Program for Contaminated Site Management in Low and Middle Income Countries. Retrieved from https://openknowledge.worldbank.org/handle/10986/18631

IV.2: Bond Finance Programs

General subject matter material from this section was adapted from the CDFA *Development Bond Finance Reference Guide*, 1998, Updated 2008, Council of Development Finance Agencies. More advanced subject matter was adapted from the CDFA *Advanced Bond Finance Reference Guide*, 2003, updated 2010, Council of Development Agencies These reference guides provide a solid foundation for understanding the use of tax-exempt bonds, essential elements of private activity bonds, deal structuring, the issuance process and much more.

Baar, A. (1996, March 20). *Bond Issues May Play a Large Part in 'Brownfield' Cleanup*. *The Bond Buyer*, *315*. Retrieved from http://www.highbeam.com/doc/1G1-18107440.html

Business Oregon. (2013). *Brownfields.* Retrieved from www.oregon4biz.com/Business-financing-resources/Oregon-Finance-Programs/Brownfields-Redevelopment-Fund/

City of Chicago. (2003). *Chicago Brownfields Initiative: Recycling Our Past, Investing in Our Future.* Retrieved from www.csu.edu/cerc/documents/ChicagoBrownfieldsInitiativeRecyclingOurPastInvestinginOurFuture.pdf

City of Chicago. (2013). *Chicago Brownfields Initiative*. Retrieved from www.cityofchicago.org/city/en/depts/dgs/supp_info/chicago_brownfieldsinitiative.html
**The Chicago Brownfields Initiative is a very successful urban programs that provides financing for various phases of brownfield redevelopment. The City funded the Initiative with a $2 million general bond issuance.*

Council of Development Finance Agencies. (2013). *How the Tool Works: Qualified Private Activity Bonds*. Retrieved from http://www.cdfa.net/cdfa/cdfaweb.nsf/ordredirect.html?open&id=cdfa-htw-qpabs-2013.html
** This CDFA "How the Tool Works" profile explains Qualified Private Activity Bonds (PABs), which drive most projects involving both the public and private sector. This informative document provides an overview, different types of PABs, model programs, the roles of various participants in the PAB process, and more.*

Council of Development Finance Agencies. (2008). *Development Bond Finance Reference Guide*. https://www.cdfa.net/cdfa/store2.nsf/browse.html?open&so=popularity

Council of Development Finance Agencies. (2010). *Advanced Bond Finance Reference Guide*. https://www.cdfa.net/cdfa/store2.nsf/browse.html?open&so=popularity

Eurofi. (2011). *The Europe 2020 Project Bond Initiative.* Retrieved from http://www.eurofi.net/wp-content/uploads/2012/09/Eurofi_Project_Bond.pdf

European Investment Bank. (2013). *Gingko Fund*. Retrieved from http://www.eib.org/projects/pipeline/2008/20080189.htm

Lewis, G., Paull, E. Northeast Midwest Institute. (2009). *The Cleanup War Chest: State Bond Financing for Environmental Initiatives and Brownfields Redevelopment*. Retrieved at http://www.nemw.org/images/stories/documents/CleanupWarChest.pdf

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** The* Practitioner's Guide to Economic Development Finance *provides a comprehensive resource dedicated to understanding and utilizing development finance tools such as bonds, tax increment finance and special districts, tax credits, revolving loan funds, and much more.*

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