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OCT 18 2017

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Dear Administrator Pruitt:

Hope Cupit

Lisa Daniel

The Environmental Financial Advisory Board (EFAB or the Board) is pleased to present the enclosed report, "Financing Lead Risk Reduction". The report was prepared after considerable discussion among board members surrounding the news about Flint, Michigan and other cities which struggle to pay for lead service line replacements. According to the Pew Charitable Trusts, "removing leaded drinking water service lines from the homes of children born in 2018 would protect more than 350,000 children and yield \$2.7 billion in future benefits, or about \$1.33 per dollar invested."ⁱ

Marie De La Parra

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In coordination with several U.S. EPA offices, the Board was charged with identifying and recommending options for improving infrastructure through innovative public and private sector financing. U.S. EPA also asked the Board to identify tools to finance lead risk reduction projects nationally, regionally, and locally. The need for financing lead risk reduction was expanded beyond just lead service lines to include lead paint removal projects.

James McGoff

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Richard Weiss

In order to better understand what financing mechanisms could be proposed, EFAB first reviewed the effectiveness of existing financing and funding programs and identified gaps and barriers in utilizing these existing resources. Our report identified new financing approaches that go beyond conventional measures and recommends a more holistic approach that considers multiple sources of lead hazard contamination through framing lead in the context of resiliency.

Michael Shapiro

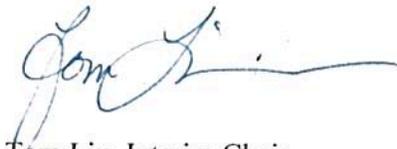
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The Board reviewed current constraints and barriers to lead remediation and assessed the gaps in existing financing and funding mechanisms. The Board also provided a summary of many of the better known and frequently used lead remediation programs and highlighted unique and noteworthy state and local programs that were seen as worthy case studies. Also included in the report is a job impacts summary.

Lastly, we recommend new approaches to financing and funding lead risk reduction activities through existing programs such as the Drinking Water State Revolving Loan Fund ("SRF"), a widespread and successful federal-state-local partnership that already broadly uses the capital markets to expand state low interest and low transaction cost loan capacity, water infrastructure pooled loan financing program, "PACE"/tax lien financing, and the linked deposit loan program. These financing options are examples of looking at lead risk reduction opportunities that go beyond traditional funding mechanisms and support using more innovative approaches.

We hope this report is helpful to you and the US EPA staff and would be pleased to discuss our analysis and summary in further detail.

Sincerely,



Tom Liu, Interim Chair
Environmental Financial Advisory Board

Enclosure

cc: Mr. Barry Breen, Acting Assistant Administrator
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Environmental Financial Advisory Board

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Financing Lead Risk Reduction

This report has not been reviewed for approval by the U.S. Environmental Protection Agency; and hence, the views and opinions expressed in the report do not necessarily represent those of the Agency or any other agencies in the Federal Government.

October 2017

Printed on Recycled Paper

**FINANCING
LEAD RISK REDUCTION
REPORT**

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Part One: Introduction to EPA Charge

US Environmental Protection Agency (USEPA) charged the Environmental Financial Advisory Board (EFAB) with identifying and recommending options to improve infrastructure by encouraging innovative private and public financing. USEPA asked EFAB to specifically identify tools that can be used to finance lead-risk reduction projects nationally, regionally, and locally. The hazard of lead contamination impacts all populations in urban, suburban, exurban and rural communities throughout the United States, regardless of household income levels.

USEPA's charge asked the EFAB to review the effectiveness of existing financing and funding programs and options, and identifies gaps and barriers to success in these resources. Finally, USEPA asked EFAB to identify potential new approaches, beyond conventional financing of mitigation by taking a more holistic approach, one that considers multiple sources of both lead hazard and contamination, and funding sources.

Part Two: Summary Observations, Opportunities and Options for Financing Lead Risk Reduction

Below we provide an assessment of the current lead abatement financing landscape as well as opportunities for expanding the current funding and financing programs. We will begin with a brief summary of the issues impacting lead abatement as well as the opportunities and options for moving forward.

- ***Existing financing programs provide an excellent foundation for expanding lead abatement programs.*** Though there is a critical need for new and innovative lead abatement financing approaches and tools, there is a financing foundation in place through existing programs such as the State Revolving Loan Fund Program, the linked deposit program, and PACE energy financing. The first step in creating new financing tools should be to clarify the potential for existing mechanisms to be expanded and modeled for lead abatement. Federal and state leaders can play a critical role in this regard.
- ***There is a critical need for better coordination.*** Until there are no new cases of lead poisoning and all testing levels are zero, there is still a need for better organization and coordination within every state to address lead contamination issues. Though there are examples of very effective programs across the state, the ubiquitous and insidious nature of the lead contamination problem will require myriad programs working in concert across multiple infrastructure financing processes and projects. Federal and state leadership and coordination would be invaluable in this regard.
- ***Lead abatement and reducing lead exposure must become much more of a policy and financing priority.*** The adverse impact of lead on human health requires a more concerted effort by public leaders to make the issue more of a priority. Specifically, there needs to be prioritization for lead removal programs, better education to inform homeowners about the hazards of lead, and the funding and financing tools available for supporting lead abatement activities.
- ***Existing federal funding programs can be improved by modeling state programs.*** Federal funding and reimbursement systems should be modeled after successful practices set up by other states. In other words, what is working should be scaled and modeled at the local, state, and federal levels. Specifically, eligibility for funding should be based on public-health goals and financial needs.
- ***Existing funding and financing systems are too myopic.*** Though there are a variety of funding programs available, these programs are often only applied to specific lead abatement issues or sources of lead, whether they are from paint, pipes, or fixtures. Though targeted resources will

always be necessary and a reality, it is essential that they are supplemented and strengthened with programs that are holistic in nature and able to be implemented based on unique community and homeowner needs.

Part Three: Framing the Issue of Lead

Lead poisoning is entirely preventable. Lead poisoning often results in no obvious symptoms and can go unrecognized until serious damage has occurred due to accumulation in the brain, nervous system, red blood cells, and kidneys. Air, soil, dust, food, paint, cosmetics, cookware, batteries, water, etc. can expose humans to lead. Once lead enters the human body it accumulates in bones, blood, and tissue. If the problem is caught in time, before permanent damage occurs, the source of lead can be removed and the accumulated levels of lead in the body will start to recede.

Generally, lead exposure has a greater impact on children, which tend to show signs of severe lead toxicity at lower levels than adults. The outcome is particularly debilitating on developing brains, resulting in permanent intellectual and behavioral problems. According to the Centers for Disease Control and Prevention (CDC), approximately 535,000 children between the ages of one to five are currently diagnosed with elevated blood lead levels (EBL) of 5mg/dl or higher, although any EBL is a cause for concern¹. Even low levels of lead poisoning in children can cause learning disabilities, decreased intelligence, speech problems, hearing loss, hyperactivity, attention deficit disorder, and even aggressive and violent behavior. Higher levels of lead exposure can reduce motor control and balance, developmental disabilities, organ damage, coma, convulsions, and even death. Though children are most at risk, even adults with low levels of lead exposure may experience impacts such as fatigue, impaired concentration, depression, and an increased risk of cardiovascular disease, and early mortality. High levels of lead exposure in adults can also cause hearing loss, anemia, miscarriages or stillbirths, seizures, and death.

Lead is a significant public health concern in cities with older infrastructure. The primary sources of concern are lead-based paint from dwellings built before 1978 and drinking water as a result of corrosion of household plumbing fixtures and lead-containing service lines (the pipes connecting the household to the water main.). In addition to these sources, the soil around homes and public places, including schools, childcare facilities and playgrounds can also become contaminated with lead from air pollution or lead paint chips generated by improper remodeling projects. While lead was removed from gasoline several decades ago, it can still be present in the soil near roadways.

- A. *Understanding the Concerns of Lead Paint.*** The federal government banned the use of lead-based paint in 1978, following studies that showed a strong connection to severe health problems (particularly in children under the age of six). However, exposure to lead from lead-based paint remains a significant and widespread environmental hazard in many states. Millions of dwellings still contain lead-based paint on their walls and windows. When the paint is not flaking or chipping into “bitable” and ingestible pieces it is not considered a hazard, but it may be difficult to keep the home in this condition long-term. If lead-based paint is removed through scraping it is an immediate hazard. Scraping and sanding creates a very harmful dust that can be inhaled. It is essential that lead-based paint is removed through proper procedures to protect residents. However, paint peels much more easily from window frames because of the friction caused by frequent opening and closing. Lead poisoning can be prevented by screening children at risk and correcting these hazards, especially in older dwellings.

¹ <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6213a3.htm>

Although the nationwide decline in lead paint poisoning since the 1978 ban is considered a public health success story, until there is zero exposure, children will remain at risk and there is a need to expand efforts to eliminate all exposures to lead.

- B. Constraints and Barriers to Remediating Lead Paint.** In 2008, EPA issued the Renovation, Repair and Painting Rule (RRPR). This rule requires contractors working in pre-1978 homes to be certified as lead-safe and therefore to utilize specially approved practices to control and clean up the dust resulting from any home remodeling. The RRPR covers all renovation activity including small projects when more than six square feet of painted surface inside or twenty square feet outside are disturbed. While it is good that this rule covers even small painting projects or even a single window replacement, homeowners and landlords may not be aware that they should work only with a lead-safe certified contractor or may take a Do-It-Yourself (DIY) approach.

As a result, some states are proactively addressing potential contamination problems beyond the RRPR. For example, Maryland strengthened its prevention, control, and enforcement policies following the CDCs recommendation for increased action and advocacy. Maryland's Lead Law requires pre-1978 rental dwelling units to be registered to reduce the potential for children to be exposed to lead paint hazards by performing specific lead-risk reduction treatments prior to each change in tenancy. When coupled with required blood level testing in children, the Maryland law can significantly reduce the lead poisoning risk. Maryland also revised its Lead Testing Targeting Plan, effective March 28, 2016, to define the entire state as "at-risk" for exposure to lead and required that children born on or after January 1, 2015 be tested for lead exposure at ages one and two.

Even with the RPPR adoption, there are vast differences among the states related to regulations, including testing requirements and enforcement. For example, even if state regulations require physicians to perform blood lead level tests on young children, the results are not always sent to the state Health Department for action, follow-up, tracking, or action. Many states wrongly believe that lead from paint or dust is no longer an issue, especially when compared to the issue of lead in service lines such as Flint, Michigan.

- C. Understanding the Concerns of Lead Service Lines (LSLs).** Many policy measures have been implemented over the last several decades to manage lead exposure within the nation's drinking water systems. These measures include the 1996 amendments to the Safe Drinking Water Act (the Lead and Copper Rule) and the 1988 Lead Contamination Control Act. Unfortunately, an estimated 6 million or more lead service lines remain in use nationwide by more than 11,000 community water systems serving as many as 22 million Americans.² The crisis in Flint heightened national awareness of the issue prompting many utilities to examine whether or not they had lead exposure from drinking water service lines or plumbing and to consider actions they should take. It also prompted advocacy, including the American Water Works Association (AWWA), which champions a policy of "eliminating all lead service lines" from community water systems.³

² Cornwall, David A. and Brown, Richard. *National Survey of Lead Service Line Occurrence*. Journal AWWA (Vol. 108 No. 4) April 2016.

³ <https://www.awwa.org/publications/connections/connections-story/articleid/4081/together-lets-get-the-lead-out.aspx>

D. Constraints and Barriers of Lead Service Lines. One of the biggest constraints to replacing lead service lines is the cost associated with full replacement of the lines. In Flint, Michigan, for example, lead service lines were connected to galvanized pipe and after almost a century of use, the iron rust absorbed the lead at very high levels. When Flint decided not to continue corrosion control measures, the iron rust fell off, carrying a significant amount of lead with it into the water system. To date, Flint has removed 800 lead-tainted pipes but must replace another 28,000 before its system is fully upgraded.

Although the high cost of pipe replacement is probably the biggest barrier facing communities, another is that cities do not always know where their old pipes are buried, what material they are made from, and/or do not have records in readily available format. Many systems, like Flint, were put in place many decades ago before GIS mapping was available. As a result, many communities do not have accurate information regarding location, type of pipe, service data, or condition. Even though newer technologies are available, many cities across the country still need to conduct an inventory of their existing infrastructure assets. Asset management requires capital, capacity, and technology, and might also reveal a much bigger lead concern than originally imagined. Such was the case in Washington, D.C., which began replacing lead pipes in the early 2000s and discovered the extent of the lead problem had been greatly underestimated.

Even if a utility desires to replace all of its lead service lines, additional barriers may exist when homeowners are unwilling or unable to pay the cost of replacing their portion of the service line. In only a few locations do water utilities own the service line running to the home. Some communities experience an “unwillingness to pay” for the cost of full service line replacement, which typically involves private property. Typically, this type of replacement necessitates coordination between a private plumbing company and a utility to complete the entire replacement. Understanding the type of plumbing in the household may create additional delays and costs. These problems are primarily mitigated when a utility owns the entire service line, but this ownership system is less common than mixed ownership of the service line. When the extent of lead in service lines is unknown, water quality testing for lead is another means of determining the extent of the contamination. This testing is not without its own challenges, however, as utilities must rely on homeowners to be willing to take the tests and to understand how the test should be administered. There is no guarantee that a test was taken from the correct location or using the correct procedures. Testing can also be expensive to conduct and often requires qualified personnel to administer. When high lead levels are found, filters are sometimes used by communities to reduce lead levels, but filters must be routinely replaced and are not a permanent solution to the exposure risk.

E. Privately Owned Plumbing. It is important to note that in addition to privately owned LSLs the plumbing and appurtenances within buildings, particularly those built decades ago, will have lead content as well as lead solder. Therefore, even if LSLs are totally removed, exposure to lead will still prevail until the plumbing is replaced.

While state and local plumbing codes and environmental regulations restrict lead within the plumbing and fixtures, often these requirements do not require immediate retrofit of plumbing and fixtures containing lead, thus elimination of those lead sources require either voluntary owner action or required retrofits in connection with building renovations or when building permits are issued related to the property. In addition, there is no utility or other public ownership interest in private plumbing and therefore utility sponsored activities will not mandate owner action. Given the absence of utility ownership, the likelihood of utility

sponsored funding or financing programs is diminished and property owners will need to look to direct government and/or private sector sources.

F. Financial Considerations. For residential and rental building owners alike, there are a number of financial considerations that affect their decision to address lead exposure, whether related to lead in water supply and plumbing or lead based paint. First and foremost, is the issue of cash-flow. Typically, owners do not have a substantial price reduction at the time of purchase for these issues. They are disclosed, but given the commonality of the issue, they are not addressed from a pricing perspective. With the exception of demolition or renovation, these issues are not addressed from a reserve perspective either. Homeowners and rental building owners rarely establish a reserve account to address building environmental issues. (*Not so related to radon and malfunctioning septic systems*). Conversely, during renovation or demolition, building environmental issues often are part of the budget and are addressed through the capital improvement budget.

Second, investment in addressing lead exposure rarely leads to a significant return on investment. Houses where the lead issues have been fully resolved command similar prices to those properties with unabated problems. Moreover, the market values properties on numerous factors which outweigh an investment in lead reduction. Similarly, investment in lead abatement in rental units shows a poor return on investment. Rents, like home values, are controlled by the market. Landlords price for what the market will bear. Tenants will make decisions based upon what they can afford. An investment in lead abatement will not allow the landlord to increase rents significantly.

In both of these instances, owners have little financial incentive for addressing lead issues. However, the decision becomes more complex where lead abatement is part of improvements that enhance the value of the property in ways the market will recognize. For example, replacing all of the old plumbing in a house as part of an extensive renovation can improve the overall value of the property. The value creation results from the overall appeal of the renovated property, with the comfort of knowing that all of the plumbing issues are resolved. Similarly, in a rental context, an owner may see value creation through renovation. For example, a freshly renewed property with new lead-free plumbing fixtures will likely command higher rental rates, and such higher rates justify the necessary capital improvements.

Another financial consideration, particularly in the context of renovation, is the cost of funds. Many public financing sources have very low (2% to 3%) interest rates. The difference between this amount and traditional sources is minor for individual homes. However, for renovation of larger rental properties, these savings could be sufficient to have the owner consider additional sources of low cost funds to address lead exposure. These lower cost funding opportunities would be most attractive when the lead abatement funding has the dual benefit of reducing lead exposure as well as enhancing the value of the property as set forth above.

Finally, owners need to consider the costs of gaining access to non-traditional funding sources. If the funding benefit is low and the application process and approval complex, owners will not be enticed even by low cost funds and make their decisions based upon a known process and a known cost. Of concern, particularly with rental property owners, is the cost of delay which, depending on the application period and the scope of the work, could lead to unoccupied property(ies) for extended periods. Since these funds are a minor component of the capital stack, the costs of delays could quickly outweigh any lead abatement costs.

Part Four: Assessment of Existing Financing/Funding Mechanisms and Identified Gaps and Barriers

Ultimately, consumers pay, either directly or indirectly, for lead mitigation and remediation. Direct payment means those fees and charges, including payments to remediation firms, are paid by individuals. Direct payments do burden some consumers, particularly low-income households. In contrast, taxpayer or utility ratepayer-supported initiatives help spread costs over a wider base through indirect means. Indirect payment through tax or ratepayers recognizes that, in the end, lead mitigation and remediation saves tax or ratepayers money by avoiding large, unnecessary costs due to poor health, disability, social disruption, incarceration and early death. As a challenge that imposes society-wide costs, lead mitigation and remediation calls for a portfolio of solutions; no one option will work for all communities because the nature of the problem and the community addressing it will vary widely.

While lead contamination is geographically dispersed and often found on private property, it can be likened to a “superfund”-type problem. As an environmental and health threat, lead presents a difficult challenge because it is often found on private property and may be mixed ownership between the utility and the homeowner. As we mentioned above, this mixed ownership creates a particular challenge for a utility because replacement may need to be coordinated between a homeowner and the utility because partial replacement of service lines (replacing only that portion owned by the utility) can actually worsen the lead problem. For this reason, remediation will require new models of shared responsibility, coordination, and funding between utilities and customers.

Lead contamination is an entrenched, harmful, and insidious public health problem in the United States. The most effective public funding and financing programs are those that support those actions that quickly, efficiently, and effectively remediate lead exposure, especially among the most vulnerable populations. Eligibility for funding is often based on public-health goals and financial needs. Before determining what innovative mechanisms can be recommended and implemented, it is important to look at existing programs for lead hazard reduction and infrastructure investments to determine gaps.⁴ Later in this report we provide recommendations and options for scaling the lead mitigation and remediation financing.

A. Federal and State Funding and Financing Programs. As with most large-scale public health, infrastructure, and economic need, addressing lead exposure will end up being a public funding and financing systems. To that end, federal programs from the following agencies constitute the most widely used and well-known programs:

- Department of Housing and Urban Development (HUD)
- Department of Agriculture Rural Development (USDA/RD)
- Environmental Protection Agency
- Department of Energy (DOE)

⁴ Please refer to Appendix A for a more detailed list of some of the more widely used funding sources for lead hazard reduction and infrastructure investments.

- Economic Development Administration (EDA)
- Center for Disease Control (CDC)

These agencies offer a variety of programs to help local communities mitigate lead exposure from paint and lead service lines. Though these programs often serve as the foundation for many other state and local lead funding programs, there are constraints to their use. For example, most federal programs require a local match, and though the programs cover a range of housing types they are mostly geared towards single-family and multi-family residences. In spite of these potential limitations, federal programs can address multiple community needs. For example, while most federal programs target safe housing repairs, DOE weatherization funds can pay for the replacement of lead-based painted windows and doors, while the EDA focuses on job creation and private investment in economically-distressed areas. Although the DOE and EDA programs do not specifically target lead, both are well suited for lead removal projects.

Perhaps the most widely used federal funding source is the Community Development Block Grant (CDBG) program. Using a set formula that considers many factors such as population, poverty and the age of housing, almost all U.S. states (except Hawaii) are then able to provide smaller communities an opportunity to use these funds to preserve affordable housing, provide services, and to create and retain jobs. Many states that receive funding from HUD and DOE use the funds to create programs that target lead paint concerns, lead service lines, or home weatherization needs that are specific to their state's needs to protect children, pregnant women, low income households, and seniors. Some states, such as New York, use their funds to establish incentives to encourage lead mitigation and remediation.

Though grant funds are obviously highly sought after, federal and state loan sources are more widely used, like the Drinking Water State Revolving Fund, Rural Utility Service (RUS) or the Federal Housing Authority (FHA) loans. Grant programs are also common. These programs, like the one found in Phoenix, Arizona's Lead Hazard Control Program, help homeowners, landlords and tenants in targeted areas who are in the low-to-moderate income level, must include a child under age six or pregnant resident, and the residence must be constructed before 1978.

- B. *Utility rates and charges.*** Perhaps the most direct way to finance lead abatement projects is through on-bill financing of regulated private and publicly owned utilities. Specifically, ratemaking treatment by regulators can provide incentives or disincentives to address lead in drinking water systems. State public utility commissions are in the process of identifying various models for recovering the cost of replacing lead service lines. A potential barrier to the expanded use of utility revenue to financing lead abatement, especially to underserved communities, is that certain states have "anti-donation" clauses which limit or restrict state/local government/utility funding of certain expenses related to individuals or subclasses of the community or utility customer base. For example, New Mexico's state constitution states with respect to the construction of any railroad that "neither the state nor any county...or municipality...shall directly or indirectly lend or pledge its credit or make any donation to, or in aid of any person, association or public or private corporation."
- C. *Regulatory Constructs and Water Rates.*** Investor owned utilities routinely fund capital investments and recover the associated financing costs from customers in utility rates. Low cost loans, grants or property tax credits, when available, are funded through taxation. Therefore, a "zero cost" lead replacement solution is not really "zero cost" when citizens are taxed to

support it. If taxpayer supplied capital, like grants, are available to investor-owned utilities, then such a funding vehicle should be used to replace service lines. Investor owned utilities routinely recover infrastructure costs associated with restoring other parties' assets. While water utilities do not own the roads, sidewalks, driveways, patios, etc. these are often dismantled or disrupted to replace infrastructure projects. The cost and work of restoring these assets are properly capitalized and collected in utility rates. This has two important advantages. First, it allows the utility to complete the work, which is a more efficient and thorough approach than relying on individual homeowners to make arrangements for the work and the financing. Second, recovery of lead service line replacement through water rates spreads the cost to the entire customer base, just as the costs of other localized projects such as main replacement, pump stations, and storage tanks are spread out to the entire customer base.

D. Local Codes, Ordinances and Rebates. Though not technically a funding source, local codes and ordinances, as well as local fee rebate programs, can be effective tools for encouraging lead mitigation and remediation. Specifically, these tools have the potential to move citizen and ratepayer action either through statutory requirement or financial incentives. Madison, Wisconsin, for example, passed an ordinance that required property owners to replace their portion of the lead service line. Homeowners who choose not to comply can be charged a monetary penalty that can be quite high. Disparities in local regulations may be a significant barrier to addressing lead issues through codes and ordinances. Model codes and ordinances are useful in this regard, particularly the disclosure of lead risk. The most effective ordinances address both single-family and multi-family housing, as well as penalties for noncompliance.

Rebates have been used to promote lead service line remediation. In Boston, Massachusetts, property owners are eligible to participate in a lead replacement credit of up to \$2,000 towards the cost of the replacement. Menasha, Wisconsin also provides rebates to property owners of 50% of the replacement cost for the homeowner's portion of the service line, although the rebate has a cap.

E. Tax Credits. Federal tax credits are not an existing funding source to mitigate lead, though they have been used within the federal and state tax structure to incentivize certain investments by individuals, businesses and investors. State tax credits, however, have been used successfully for lead mitigation. In Massachusetts, for example, property owners who receive a letter of Full Compliance are eligible for a state tax credit equal to the cost of the lead removal expenses, or \$1,500, whichever is less. Rhode Island is another state that authorizes an individual to take a credit against their personal income tax liability for residential lead removal or lead hazard reductions under certain conditions.

Key Gaps and Barriers. Though each of the above programs has their own unique opportunity and barriers, there are a few common issues that have prevented many of them from being used to the maximum extent possible.

F. Lack of Data. In many communities, lead contamination may not be well known or mapped. The available data also may not be readily accessible. The high cost of gathering and developing accessible information sharing platforms can be a barrier to action.⁵

G. Insufficient Program Coordination. Programs exist at all levels of government and fragmentation is a challenge. Information sharing and coordination can help facilitate

⁵ See <http://www.civictmapper.com/2016/11/15/lead-pipe-mapping/>

implementation of remediation projects by lowering costs to participating agencies and providing an opportunity for prioritizing resources to the highest priority projects. States could establish a central information source on remediation for all forms of lead contamination. Engaging the nonprofit sector and public health agencies will be important as well.

- H. *Insufficient Public Outreach and Education.*** More attention is needed to public outreach and engagement on lead issues. This may involve developing materials in alternative format and languages and identifying appropriate means of communication, including community forums and online resources. Working with community organizations may increase the effectiveness of these efforts.
- I. *Lack of Financing Clarification in Federal Law.*** Federal law and rulemakings regarding lead contamination in various media (paving, soil, and water) should be clarified. In particular, requirements for testing for lead exposure in public and private schools should be clarified.⁶
- J. *Incomplete Research.*** Research is needed to ensure that programs are cost-effective. Evaluation and performance metrics ensure that resources are devoted to the most cost-effective programs. The Environmental Finance Centers and others can be deployed to identify the most effective and efficient practices.

⁶ Recommended revision to the lead and copper rule of the SDWA can be found here: <https://www.epa.gov/sites/production/files/2016-01/documents/ndwaclcrwgfinalreportaug2015.pdf>

Part Five: New Approaches to Financing/Funding Lead Risk Reduction Activities with Existing Programs

As we described above, there is a foundation for financing lead abatement in place. Next we address some of the opportunities to modeling other successful financing programs as well as building new and innovative programs, tools, and processes. We address innovative financing opportunities that have the potential to be applied to lead abatement. These include: The State Revolving Fund (SRF) Program; the federal-state-local water infrastructure pooled loan financing program that harnesses the capital markets to expand low-interest loan capacity; the “PACE” tax lien financing program; the linked deposit loan program; and, innovative public private financing.

A. Direct Financing Through the State Revolving Fund Program. Given the success of SRF programs throughout the U.S., there is an opportunity to directly fund lead mitigation and remediation efforts under the Drinking Water SRF program. Existing Drinking Water SRF programs are a widespread and successful federal-state-local loan partnership that already broadly uses the capital markets to expand state low interest and low transaction cost loan capacity. More specifically, the SRF program can provide direct funding via the capital markets to a municipality which aggregates approved homeowners’ funding requests and secures the aggregate loans with its general obligation or other security pledge. This financing approach offers two important benefits:

- A below-market interest rate: as required under the SRF program which is also attractive to homeowners; and,
- Economies of scale relating to the bond issuance costs: SRF programs are pooled financing, which allows fixed issuance costs to be spread across all borrowers and a potentially large funding base, which exists in most states. This assumes that participating homeowners provide their personal credit to secure the loan as opposed to an assessment on their property (also discussed in the “Adopting a PACE/Tax Lien Financing Program” recommendation below). Furthermore, current SRF program requirements under the Federal Drinking Water SRF program would still need to be met.⁷ The schematic in Exhibit 1 below explains how the program would work.

Generally, the SRF program has the potential to offer two financing benefits to address tax restrictions. First, the SRF program can provide loan financing to a non-governmental person from an SRF tax-exempt bond financing, in an amount equal to the lesser of:

(a) \$5 million, or

(b) 5% of the bond proceeds under the “private loan test” requirements of the current tax code.

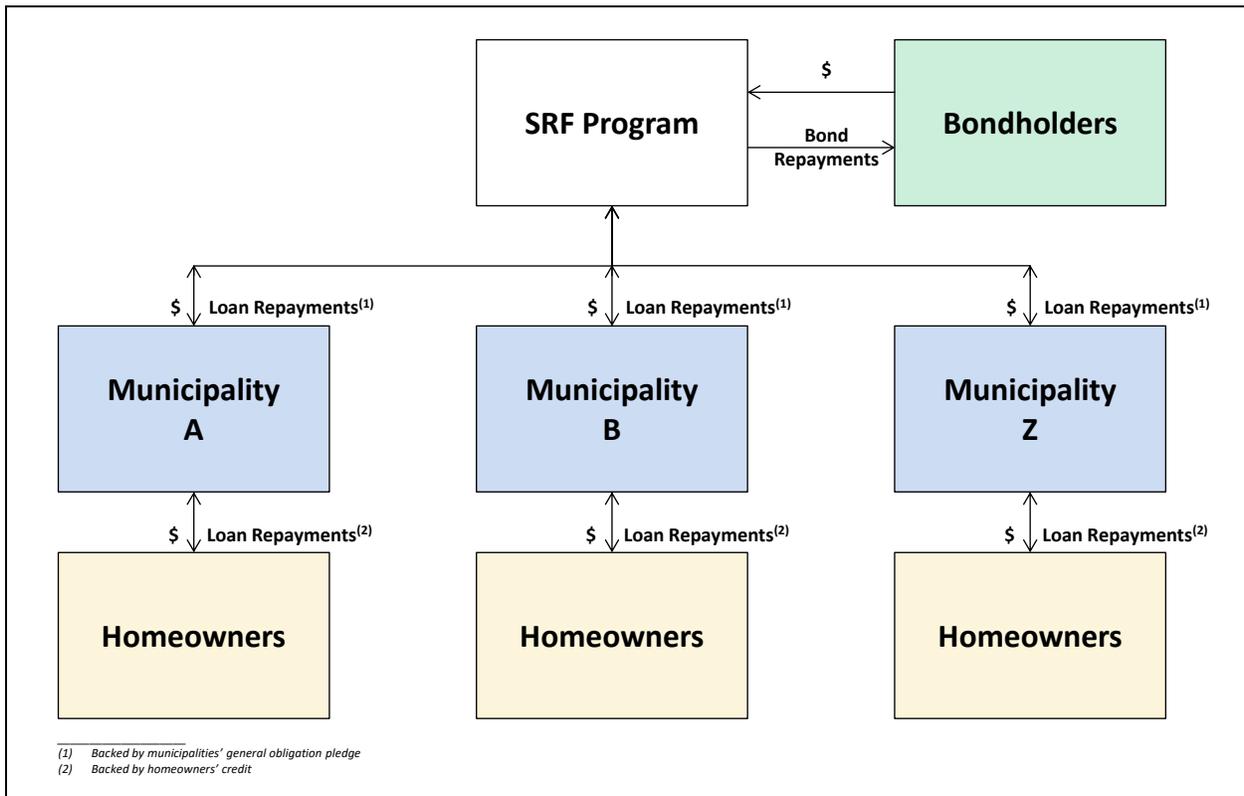
If these limits are exceeded, the entire SRF bond financing may be deemed taxable and subject to higher rates and the issuer subject to certain penalties. Furthermore, once the tax-exempt bond proceeds are loaned to municipalities, there may be restrictions on the loan rate that the

⁷ Since most SRF programs in the U.S. provide funding for their borrower needs by leveraging in the municipal capital markets on a tax-exempt basis, SRF programs have various tax restrictions pertaining to the issuance of bonds, the use of bond proceeds as well as other restrictions in order to maintain the tax-exempt status of its SRF financing. Though this report considers these tax requirements on a general level, SRF programs should engage tax counsel to review, analyze and opine on all tax requirements relating to this financing recommendation.

municipality can charge to the homeowners. However, SRF program assets that are “not attributable” to a tax-exempt financing – such as Federal capitalization grant monies and servicing fees – may not be subject to these limitations.

Second, the SRF program can provide loan financing through the issuance of taxable bonds, which in the current market may only be a slightly more expensive option than tax-exempt financing. More importantly, unlike a tax-exempt financing, a taxable bond financing typically does not involve any tax or financing restrictions (such as the limitation on the municipality’s loan rate to the homeowner). Additionally, in the current market, the taxable rates, especially for highly-rated SRF programs, will typically be lower and thus more attractive when compared to the homeowners’ alternative cost of funds.

Exhibit 1 – Direct Financing through the State Revolving Fund Program



In addition to the increased funding available for qualified homeowners described in the loan financing scenarios above, this financing strategy benefits the SRF programs by increasing the borrower diversity of the SRF loan portfolio (which is important to maintain the SRF program’s ratings and to address any borrower concentration concerns) and by increasing the SRF program’s efficiency and funding capacity (which is achieved by converting available monies to long-term loans and leveraging the corresponding loan repayments). While the first financing opportunity described above tends to favor larger SRF programs with a relatively large asset base and tax-exempt financings, the second financing opportunity can benefit all SRF programs.

It is important to consider that for this financing recommendation. It assumes the active participation of the local government/utility/SRF borrower in the following:

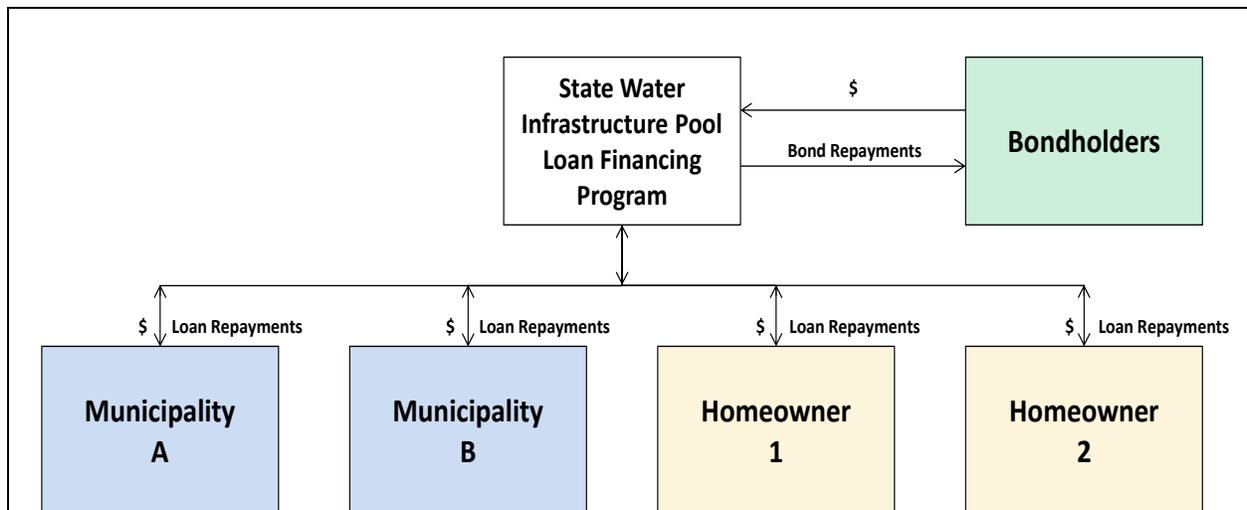
- (a) Aggregating homeowner loans,
- (b) Securing it with the municipality’s general obligation or utility revenue pledge,
- (c) Seeking funding through the SRF program, and
- (d) Tracking homeowner loan repayments.

Furthermore, the local government/utility/SRF borrower is assuming the full credit risk associated with the homeowner not making their loan repayments. Given the limited staffing and resources at the local level, as well as the associated credit risk related to each homeowner loan, the local government/SRF borrower may not be able or want to serve in this function, especially with relatively smaller, less financially sophisticated local governments.

- B. Water Infrastructure Pooled Loan Financing Program.** In addition to expanding the impact of the SRF program, there is also the opportunity to establish a water infrastructure pooled loan (non-SRF) financing program as:
- i. an extension of the existing SRF program to increase funding/loan capacity; and/or,
 - ii. a separate program to fund the borrowers’ SRF ineligible water projects.

A water infrastructure pooled loan financing program – a state-level general water financing program which offers prospective borrowers low cost, fixed rate long-term loans – can be easily structured/modeled after the existing SRF program. As with the “Direct Financing through the State Revolving Fund Program” recommendation above, the program funding would be provided through bond financing on a tax-exempt or taxable basis. Additionally, this approach offers: (i) a potentially lower cost of funds – relative to the borrowers’ alternative cost of funds, especially for lower-rated borrowers, (ii) economies of scale relating to the bond issuance costs – similar to SRF programs as discussed above, and (iii) a new funding program – which provides economical as well as expanded funding capacity. This is described in schematic in Exhibit 2 below.

Exhibit 2 – Water Infrastructure Pooled Loan Financing Program



Please note that this structure relies upon the credit strength of the underlying borrowers. If additional credit strength is needed, the state can consider the use of additional enhancements such as double-barrel structures (i.e., using a revenue pledge and a second security pledge such as sales taxes), state-aid intercept and bond insurance.

If equity funding (e.g., contributions and grants) is possibly available as with the SRF program, these monies can be used in various ways (i.e., as interest subsidy or a zero percent loan, etc.) to make the water infrastructure pooled loan financing program that much more financially attractive for prospective borrowers. Even without equity funding but using the SRF program structure as a basis (which would be relatively simple and easy to achieve), a state still has the ability to efficiently structure a *market-rate pooled loan program* which would be:

- Highly-rated: based upon the SRF program's strong underwriting standards, management and monitoring expertise; and
- Economical: based upon cost savings from the pooling of bond issuance costs.

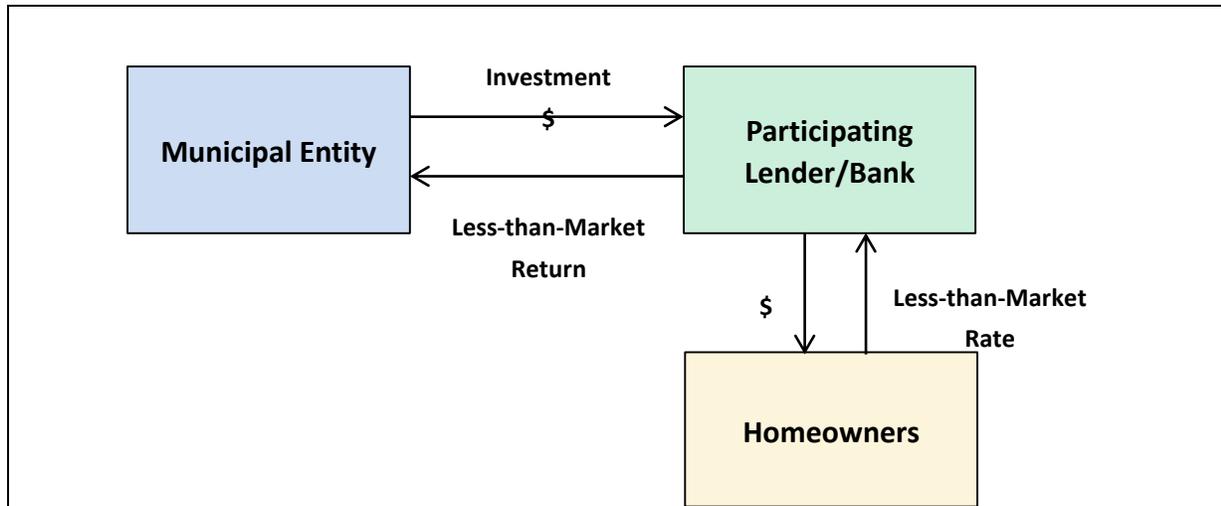
In addition to providing additional financial assistance to meet the state's funding needs, the state program can also charge borrower fees (upfront origination and/or on-going service fees) which can provide a source of revenues to the state to defray its administration costs and/or provide additional funding for borrower loans. Since SRF programs are well-recognized for their strong management, underwriting standards and monitoring activities, this new financing program could also be managed by the state's SRF program using the SRF programs' proven legal documentation and program policies. This approach should also help achieve high ratings since the rating agencies generally credit SRF programs with strong management oversight. However, there may still be challenges associated with this financing recommendation. First, depending upon state law and administrative rules and policies, a state and/or SRF program may need statutory authorization to create and administer such a financing program. Second, to increase the appeal of this program to prospective borrowers, program objectives and administrative guidelines need to be developed and prioritized and then implemented. Accordingly, administrative and staffing challenges at the state/SRF program level will need to be considered and addressed. Specifically, if SRF programs can run these new lending programs, it would need to be made clear how they would function differently than traditional SRF lending tools.

- C. Linked Deposit Loan Program.** The third lending-based financing opportunity is the linked deposit program. Generally, a "linked deposit loan" program is a financial arrangement where a municipal entity agrees to invest monies (in instruments such as certificates of deposit) with participating financial institutions and, in turn, agrees to accept a less-than-market rate of return (with the interest rate differential being equal to the market rate less the investment rate). The principal amount of the investment is then loaned to qualified individuals for specified purposes at a less-than-market rate (i.e., market rate less the interest rate differential) with the participating financial institution servicing the loan.

This financing approach offers:

- A lower cost of funds – relative to the homeowners' alternative cost of funds; and,
- A relatively simple funding structure for the municipal entity since no debt and debt issuance costs are incurred, it offers administrative ease, and the municipal entity is not involved with loan servicing. Plus homeowners only have to deal with the participating financial institutions. Please see the schematic in Exhibit 3 below.

Exhibit 3 – Linked Deposit Loan Program



Linked deposit programs have been used effectively in a number of states and could be applied to lead mitigation effectively. For example, Iowa offers low-interest loans through participating lenders to homeowners for the replacement of inadequate or failing septic systems. Linked deposit is managed through the SRF program by the Iowa Finance Authority (IFA), Iowa's On-site Wastewater Assistance Program (OSWAP). According to Iowa law, all septic systems, regardless of when they were installed, must have a secondary wastewater treatment system following the septic tank. Eligible applicants must own an existing home with a septic system in an area not served by a public sewer. Approved systems include both a septic tank and secondary treatment system such as a leach field. All projects are certified and inspected by the local county sanitarian and approved by the Iowa Department of Natural Resources (IDNR). Loans are made through linked deposits with participating lenders. Loan amounts start at \$2,000 with terms up to 10 years and a 3% interest rate. The loan can fund 100% of actual costs. One of the benefits of the linked deposit system is that the borrower can use his/her own lender. The deposit does not guarantee the loan nor is it collateral for the loan. It is only to reduce the interest rate charged to the borrower.

To start the financing process, the homeowner works with the county to determine the appropriate system. The homeowner then contacts his lender for a loan and the lender originates loans using their normal underwriting criteria and loan documents. After the loan is approved, the project is constructed. The county sanitarian inspects the completed system and the IDNR gives final approval. If it is a new lender, a deposit account in the name of IFA is created. IFA deposits funds equal to the principal amount of the loan at 0% interest into their deposit account at the participating bank. Annually, IFA withdraws from its deposit account an amount equal to the principal repayment of the outstanding loan. As a result, the amount in the deposit account will equal the principal outstanding on the loan. The applications, approvals and payments are all completed via an online system. All deposits and withdrawals are made through Automated Clearing House (ACH). Since the program's inception, Iowa has funded

1,840 loans and deposited almost \$15 million with 294 participating lenders.⁸ Additionally, Iowa uses the same structure to finance soil conservation and manure management projects.

The Ohio Water Development Authority's Water Pollution Control's Loan Fund Linked Deposit Program works in a similar manner. In addition to decentralized systems, this program also funds "agricultural or forestry best management practices" and other non-point source pollution control projects for individuals, as well as for private entities and governmental agencies. The maximum loan amount and repayment rate is set according to the participating bank agreement. For the borrower/homeowner, the interest rate would be the current bank rate for similar loans less a maximum of 500 basis points or 5%, with maximum maturities of 10 years and 20 years for private borrowers and public borrowers, respectively, subject to a useful life limitation. For OWDA, the interest rate would be the US Treasury note/bond yield less 500 basis points with a 0% interest rate floor.⁹

- D. Institutional Debt.** Institutional (bank) debt can be used to reduce lead exposure. This typically occurs as part of an investment to address renovation of single and multi-family residential units. Like the impact funds, there is an underwriting process. However, the underwriting process is more attuned to smaller projects (single family homes) and the investment rate of return (interest rate) is typically less than that desired for an impact fund. As part of the underwriting process for multifamily units, particularly large ones, the bank may well require a Phase 1 Environmental Assessment¹⁰ which will include building health issues. Since the real estate is collateral for the loan, the bank may well require the owner to address environmental issues, including lead exposure, as a condition to making the loan. Because institutional debt is less expensive than other capital (mezzanine financing or equity), an owner is encouraged to address these issues if possible.
- E. "PACE"/Tax Lien Financing Program.** An alternative to utilizing borrower-backed revenue financing, as in the previous recommendations, is "PACE" (Property Assessed Clean Energy) or tax lien financing. The major advantage of this approach is that PACE is a proven and highly-secured financing structure.¹¹ Since 2008, the PACE program has enabled local governments and municipalities to finance over \$3.7 billion in energy efficiency, renewable energy or water conservation projects on privately owned residential (as well as commercial, agricultural and industrial) properties¹². Generally, the municipality creates the PACE special assessment/tax district and arranges for funding (e.g., internal funds, municipal bonding and/or third-party financing, etc.) which is typically fixed rate debt with repayment terms between 5 and 20 years.

An integral feature of the PACE program is that PACE assessments (which are repaid in installments on the homeowners' property tax bill) are voluntary contractual assessments levied on properties in order to finance the acquisition and installation of eligible clean energy improvements (which can also increase homeowners' property values). Furthermore, the PACE

⁸ See:

http://www.iowasrf.com/program/other_water_quality_programs/onsite_waste_water_assistance_program.cfm

⁹ See: <http://www.owda.org/owda-doc/Program%20Info/NotesWPCLFlink%202011Mar.pdf>

¹⁰ Phase 1 Assessments are typically not part of a residential underwriting process.

¹¹ *Important caveat: a general discussion of the PACE program is provided below. However, state and local laws vary and PACE programs are dependent upon state and local requirements as well as the specific PACE program structure/details.*

¹² See: www.pacensation.us/pace-market-data

assessment has an equal lien status with property taxes but a senior lien status to mortgages and any other non-tax liens. Furthermore, a PACE assessment constitutes a lien against the entire property and not just the specific improvement installed and funded from the assessment. The assessment also remains with the property, irrespective of any intervening sales, until it is fully paid. Therefore, in the event of a property foreclosure or mortgage default and unlike most residential mortgages, there is no acceleration of the assessment and the new home purchaser would generally take over the assessment payments. Please see the schematic in Exhibit 3 below.

A PACE/tax lien financing program for lead mitigation purposes like the existing PACE program could provide immediate funding for the upfront costs associated for such work and also provide flexible repayment terms and conditions (e.g., lower monthly/semi-annual payments, relatively competitive interest rates, etc.). The municipality benefits since the PACE/tax lien financing program can assist in reducing the lead mitigation concerns in the community. With respect to default levels for PACE financings, reports have varied with respect to the default risks but generally appear in line with property tax default levels.¹³ Also in a default, only the accrued but unpaid portion of the PACE loan is at risk. Unlike the general PACE financing program, the homeowner may not realize the same type of property value increases as a result of a PACE/tax-lien financing program for lead mitigation.

To be clear, there are opponents to the PACE financing program. The Federal Housing Finance Agency, which regulates Fannie Mae and Freddie MAC, two large insurers in the mortgage market, as well as the Mortgage Bankers Association have voiced their concerns that because of the higher lien status for PACE assessments (relative to mortgages), there would be less money to pay them back in a foreclosure.¹⁴

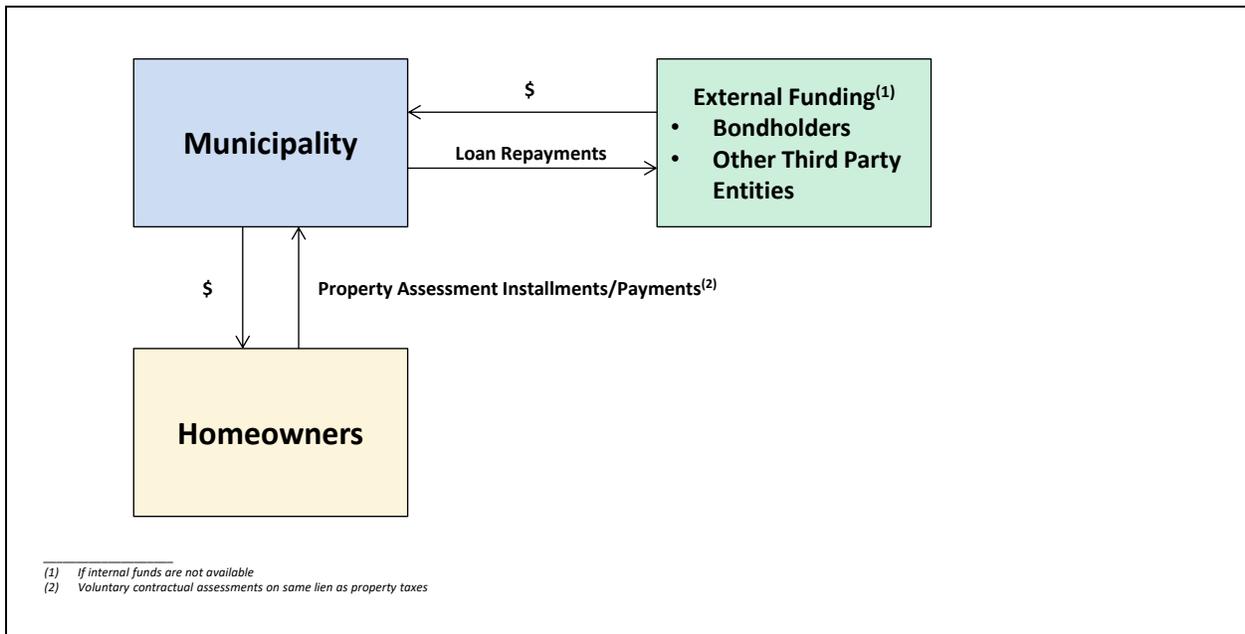
Another potential barrier to expanding PACE to lead abatement is that Fannie Mae and Freddie Mac do not currently provide financing for properties with existing PACE assessments, which may negatively affect residents with respect to any future refinancing. Furthermore, on April 5, 2017, S.838 – also known as the PACE Act of 2017 – was introduced in the United States Senate that if passed would define PACE assessments as a mortgage loan and subject the assessment to the Truth in Lending Act rules and municipalities and contractors to additional requirements.¹⁵ As a result, there may be compliance concerns with implementing the current PACE-type financing program.

¹³ See: <http://aceee.org/blog/2017/03/what-wall-street-journal-got-wrong> and “Energy-Saving Loans are Turning Bad,” The Wall Street Journal, August, 16, 2017

¹⁴ See: <https://www.mba.org/servicing-newslink/2017/january/servicing-newslink-tuesday-1-17-17/mbanow-mba-expresses-concerns-on-pace-loans>).

¹⁵ See: <https://www.congress.gov/bill/115th-congress/senate-bill/838>)

Exhibit 4 – “PACE”/TAX LIEN FINANCING PROGRAM



Finally, states governments may need to create the necessary legislation for such a program and provide the authority for the municipalities to create a special assessment/tax district. In turn municipalities would then pass needed ordinances to create the assessment zones as well as establish the creation of the lien and project funding options. To assist states and municipalities in establishing a PACE program, the Department of Energy on November 18, 2016 released “Best Practice Guidelines for Residential PACE Financing Programs”.¹⁶ There is always a risk that new legislation may change the PACE financing landscape going forward.

F. Point-Of-Sale Funding. One relatively common financing approach for addressing property improvements such as those associated with lead abatement is through point of sale financing. In fact, it is not unusual for property improvements to be funded as part of the transfer of property ownership, typically by the current owner/seller, although a portion of the improvement cost is sometimes covered by the new owner/buyer. This is typically accomplished via 1) pre-closing completion of the improvements, 2) establishing a reserve or escrow account to fund the improvements or 3) a combination of 1) and 2). The need for the required improvement can be triggered by governmental code requirements, mortgage providers, and real estate transfer practice or buyer demand. In each of these cases the need for a specific improvement is often identified via a property inspection, sometimes by a government employee or agent or a certified individual.

In the environmental/public health/utility services area such circumstances have occurred regarding radon mitigation and malfunctioning septic systems connection to public water/sewer systems, among others. Applying this approach in connection with lead mitigation would help to diminish property owner resistance to removing lead within private property because funds

¹⁶ See: <https://www.energy.gov/eere/slsc/downloads/updated-guidelines-residential-pace-financing-programs>

would be available from the sale proceeds, eliminating the need to incur debt or tap other assets.

Although a process including inspections, funding and ultimately completion of improvements could be imposed by state or local governments under their public health powers, there may be an opportunity to establish such a process in connection with the standard practices of the real estate market. In some cases, real estate brokers and mortgage providers have been the primary entities to monitor and enforce sale requirements for improvements and/or establishing reserves for such improvements. Accordingly, an effort to communicate with and educate the real estate and mortgage professionals about lead hazards and the potential for mitigation could lead to increased lead mitigation as properties are sold. There apparently is already some activity of this nature in connection with lead-based paint removal. To be clear, this type of financing option is applicable only to point-of-sale transactions and therefore would not address those properties that are not in the market. That being said, this is a common financing process that could be very effective for mitigating lead issues, assuming appropriate regulatory and educational efforts are in place.

G. Impact or Green or Environmental Social Governmental (collectively, “ESG”) Investment. ESG Funds have become more popular over the past decade and this is a developing financial sector. The objective is to obtain a financial return and at the same time achieve specific ESG objectives. These funds can work well for large projects and are underwritten to a specific financial outcome. In the case of a large project, the investment analysis and investment decision benefits from: 1) a strong likelihood of repayment (typical sponsors would be governmental or large corporations); 2) a credit worthy borrower; 3) potential collateral; and 4) a single underwriting event.

However, currently these funds are not well-suited for reducing lead exposure in private residences and rental buildings. Because of the relatively small size and wide diversity of borrowers, there will be multiple and potentially expensive underwriting. Similar to the individual loans that were responsible for the housing crisis, there would need to be a way to bundle a large dollar amount of individual loans together in order to create enough scale to make green bonds work. Since lead exposure generally affects lower socio-economic circumstances there is a greater likelihood of credit issues. For the same reason, it will be difficult to obtain collateral, particularly where any such security will be subordinate to existing first position financing. The investment incentive for the fund is minimized because funding must be at rates that are below other alternatives. Despite these challenges, lead mitigation and remediation offers the virtual guarantee of large avoided social costs (unnecessary health issues, premature death, costs of crime and incarceration) that should be appealing to an ESG investor if the financial and credit issues can be appropriately addressed.

H. Tax Credits. Several States such as Colorado, Massachusetts, and Missouri offer tax credits to encourage owners to address brownfield issues. Senator Schumer has introduced federal legislation consistent with this concept. Massachusetts and Rhode Island already have tax credit programs, but the amounts of credit are generally low (\$1,500 in MA). By analogy, this could be used to encourage owners to address reducing lead exposure. The amount of the tax credit varies by state, from 50% (CO, MA) to 100% (MO). There are restrictions on eligible costs and who can apply (typically, the polluter cannot take advantage of the credit). Finally states like Massachusetts and Colorado allow transfer of the tax credits to other taxpayers. This allows the owner to monetize the total amount of the tax credit more quickly. From an owner perspective

tax credits do not ease any cash flow issue. The tax credits are beneficial because they are a direct offset against some or all of the costs. Finally, the tax credits are established strictly to encourage addressing a public problem. As a result, there is essentially no underwriting process. An owner either qualifies for the tax credit or not.

- I. **Infrastructure Trusts.** Infrastructure trusts are often discussed as a way to fund America's crumbling infrastructure. But existing and proposed infrastructure trusts can take many forms and structures and fund many different things. Whether an infrastructure trust would be a vehicle for financing lead abatement depends on its scope of work, its capitalization, the payback structure, and how it defines infrastructure.

Some have a defined geographic scope. For example: Continental or Regional (European Investment Bank), National (India's Infrastructure Investment Trust), state/multi-state (New York Works, West Coast Infrastructure Exchange-proposed) or city (Chicago Investment Trust). Other infrastructure trusts are topical and fund only one type of infrastructure. For example, the National Highway Trust Fund supports only transportation related infrastructure. Other funds focus on energy or water. Another distinction in the scope of infrastructure trusts is whether they fund brownfield (renovation of current assets) or greenfield (creation of new assets) projects or both. A trust that would cover lead abatement would have to have brownfield assets in its scope.

Capitalization. Some infrastructure trusts are an evolution of the concept of a public-private partnership (P3) expanded to include multiple sources of private capital by creating a fund. These funds offer a wider pool of investors, liquid shares, and various tax advantages than a P3. Typically, they leverage public and private capital to generate more investment. Some leveraged funds seek capital on a project-by-project basis while others capitalize the entire fund portfolio.

Other infrastructure trusts are private investment vehicles that place their capital in specific projects with limited risk and good returns. For example, recent IRS private letter rulings seem to open the door for REITs to make infrastructure investments in addition to their traditional focus on real estate investments.

Payback. Payback can come from a stream of revenue generated by a project itself (e.g. the cost savings from energy efficiency), a revenue stream related to a project (e.g. the Highway Trust Fund is capitalized with funds generated by the gas tax), or a source of capital that has no relation to the infrastructure projects it funds. For example, the America Infrastructure Fund (HR 1669) currently proposed in Congress is capitalized by selling bonds to private companies. In exchange for purchasing these bonds, the companies will be able to bring back a portion of their overseas earnings, one-time, tax free. The bill has secured some bipartisan support in Congress.

Definition of Infrastructure. The definition of infrastructure funded by an infrastructure trust varies from trust to trust and would partially determine whether a particular trust would be a potential source of funding for lead abatement activities focused on lead drinking water pipes or peeling paint and paint dust in older homes. For example, the proposed American Infrastructure Fund defines infrastructure as transportation, energy, communications, water and education. This would probably cover drinking water pipe replacement and might cover some paint related hazards, such as window replacement, as an efficiency measure under the energy focus. But other peeling paint hazards might not be

included. A trust that included environmental improvements could provide more flexible and comprehensive funding.

The Chicago Infrastructure Trust (CIT) defines infrastructure as: “the basic physical and organizational structures needed for the operation of a society or enterprise”. It further divides this into “hard” and “soft” infrastructure. Soft infrastructure is the “underlying organization that supports the quality of our daily lives, including government, economic development, social structure, culture, sports and recreation”. Hard infrastructure “represents the underlying physical systems that support our economy, such as air, surface and water transportation, energy, water management, communications and the environment”. The CIT addresses both the hard and soft infrastructure opportunities. This definition would seem to include all facets of lead abatement. In conclusion, infrastructure trusts are a potential vehicle for funding lead abatement. Depending on the structure, a trust might fund specific components of lead abatement or it could be designed to provide comprehensive lead abatement funding, including both paint and drinking water related hazards.

Part Six: The Opportunity for Achieving Financing and Implementation Scale

Finally, we address the opportunity and potential benefits for linking multiple financing and infrastructure programs and processes to achieve lead abatement and mitigation at scale. To do so, we demonstrate the link between lead abatement and the infrastructure financing challenge of our time: community resilience. Specifically, the challenges associated with mitigating lead pollution in America’s urban areas are representative of the country’s broader infrastructure financing issues. The need for investment in our nation’s civic infrastructure – especially infrastructure that will make communities more resilient to climate impacts and other environmental shocks – is significant and widespread. This challenge is particularly daunting for cities that are already economically disadvantaged and/or vulnerable to adverse climate impacts and other natural hazards.

However, the need to repair or replace deteriorating infrastructure – water and wastewater systems, transportation networks, hospitals and schools, housing – presents an opportunity to upgrade these assets in a way that makes communities more economically, socially, and environmentally resilient. Likewise, investment in housing and water infrastructure upgrades can be leveraged to simultaneously advance lead abatement goals, particularly since lead pollution tends to be higher in urban areas that also have some of the greatest need for infrastructure investment. By integrating lead remediation into broader infrastructure investment programs, governments at all levels can enhance the scale and efficiency of lead abatement financing.

- A. Opportunities to Link Lead Abatement and Resilience and Broad Scale Infrastructure Investment.** Resilience is the capacity of an entity – individual, community, organization, or natural system – to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience.¹⁷ As communities around the country are coming to recognize, building local resilience to natural and economic shocks requires comprehensive, integrated planning and financing approaches that build the adaptive capacity of these interrelated systems. Such an integrated approach seeks opportunities to simultaneously achieve infrastructure and other community goals across multiple sectors, including transportation, housing, water and wastewater infrastructure, green

¹⁷ Judith Rodin. 2014. *The Resilience Dividend: Being Strong in a World Where Things Go Wrong*. Public Affairs.

infrastructure, energy, and data management. Lead abatement can be effectively and efficiently embedded into these planning and financing efforts, via two main opportunities: co-financing; and, integrated planning and staging.

B. Co-financing: Linking Lead Mitigation to Energy Efficiency and Human Health Programs.

Making communities more resilient, especially to the systemic and acute impacts of climate change, will require investment in myriad infrastructure systems, including water management (e.g. sea level rise, tidal flooding, storm water management, wastewater management, and drinking water), transportation, energy, data and information access, and housing and the built environment. In many cases, investments in these areas will have the secondary benefit of achieving lead reduction goals, for example when aging drinking water infrastructure is upgraded with lead-free pipes. A particularly promising co-financing opportunity is in the area of housing retrofits and upgrades. A sufficient, sustainable, and affordable supply of housing is necessary for any community to be considered resilient. Yet affordable housing is in vanishingly short supply in many urban areas, where housing costs are rising and only a quarter of families in need of affordable housing receiving assistance. Low-income families are more prone to inhabit older housing, which puts them at greater risk for lead exposure.

Retrofitting older residential buildings is essential for safeguarding human health. Because lead paint is predominantly found on windows and doors, these should be targeted for limited remediation dollars. Coincidentally, replacing old windows and doors is also one of the more effective ways to improve residential energy efficiency. This means that property owners may be able to finance such upgrades by taking advantage of the various energy efficiency tax credits and financing programs that are available across the country (such as the federal residential energy efficient property tax credit and various state-based programs, including PACE, which offers long-term private financing for energy efficiently upgrades to residential and commercial buildings.)

In addition to leveraging energy efficiency financing to achieve lead abatement goals, there may be opportunities for further financing innovations. For example, public housing authorities and other large property owners could use cost savings achieved through energy efficiency upgrades to invest in additional rehabilitation needs, such as soil amendment where lead levels are high. Federal and state energy efficiency financing programs might consider explicitly integrating lead abatement into program requirements, perhaps awarding bonus points or premiums to projects that achieve both goals.

Another financing opportunity for housing retrofits could lie in the area of health care, given the clear connections between lead exposure and adverse health outcomes. Lead paint on antiquated windows and doors is a significant source of legacy lead exposure, and replacing those windows and doors is the primary mechanism for mitigating the associated health impacts. In addition, retrofitting windows and doors is one of the most effective mechanisms for making homes more energy efficient, and there is a well-established industry associated with providing retrofit services. However, the door and window replacement costs are often financially prohibitive for many households. However, given the direct connection between retrofits and improved health, there is a potential linkage between energy retrofits and healthcare financing, specifically via Medicare and Medicaid. In other words, there is a very compelling case for enabling subsidized healthcare financing to cover the costs of energy retrofits for low- to moderate-income homeowners and renters.

In addition to improving health outcomes, home energy retrofits would have the added benefit of reducing home heating and cooling costs.

- C. Integrated Planning: Achieving Financing Efficiencies through Strategic Project Selection, Planning, and Staging.** Given the critical state of our country's essential infrastructure, lead abatement often takes a backseat to other pressing infrastructure financing needs at the local and national level. For this reason, it is prudent and perhaps even essential to embed lead abatement into broader infrastructure project prioritization, planning and staging processes.

It has been demonstrated that one of the most powerful ways to reduce infrastructure costs is to select the right combination of projects and implement them in appropriate stages.¹⁸ This may be as straightforward as timing road repairs with needed sewer line upgrades, or addressing lead contamination when drinking water pipes are due for replacement. While a seemingly obvious way to achieve efficiencies and reduce costs, for many municipalities this integrated approach to planning, financing, and staging projects represents a new way of doing business.

As communities seek to move toward resilience, they will need to invest in an array of structural, environmental, and social infrastructure projects – and it is precisely this diversity that presents innovative investment opportunities. Specifically, cities can bundle together infrastructure investment projects and community assets, creating an investment-ready portfolio that can then be shopped around to private and public finance entities. These project portfolios may be designed to advance multiple community priorities and resilience needs, for example storm surge barriers, green infrastructure networks, food security, climate-ready transportation infrastructure – and lead remediation. By advancing resilience infrastructure investment in this holistic way, cities can lay the groundwork for efficient large-scale capital flow and for long-term economic development.

Part Seven: Conclusion

Lead paint and lead service lines remain a national problem. Although we have made great strides limiting the exposure to lead, it continues to be a costly problem that continues to impact the health of millions. Continued education and funding for existing lead mitigation programs should be continued and remain intact. In addition, the EPA should promote the utilization of the Drinking Water State Revolving Loan Program, water infrastructure pooled loan (non-SRF) financing, tax lien financing, or a linked deposit loan program to help address the funding gap for lead mitigation. There are a number of other financing mechanisms that can be used to address lead concerns, such as institutional debt as well as tax credits which are currently used successfully by several states to encourage owners to replace lead based systems. Another opportunity not widely used but shows promise is infrastructure trusts, such as Chicago's, that can be set up to finance lead abatement if set up properly.

Lastly, lead mitigation should be seen in a broader context of resiliency that helps communities prepare for recovery from some type of stress or shock. As a growing trend towards integrated planning and financing for better and stronger infrastructure, there is an opportunity to link lead mitigation efforts to energy and improved human health programs.

¹⁸ McKinsey Global Institute. Infrastructure productivity: How to save \$1 trillion a year. 2013. <http://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/infrastructure-productivity>

Appendix A – Existing Funding Sources

Funding Resources		
Lead Hazard Reduction and/or Infrastructure Investments		
Funding Source	Funding Department and Grant Identifier	Funding Description
FEDERAL GRANTS	Housing and Urban Development	
	Office of Lead Control and Healthy Homes (OLHCHH)	
	Lead-Based Paint Hazard Control (LBPHC) Grant	The purpose of the LBPHC grant program is to identify and control lead-based paint hazards in eligible privately-owned housing for rental or owner-occupants. The LBPHC program is open to all jurisdictions, urban, suburban, or rural. There is a 10% grantee match for the LBPHC program.
	The Lead Hazard Reduction (LHRD) Grant	The LHRD grant is targeted to urban jurisdictions (either alone or through a consortium) that have at least 3,500 pre-1940 occupied rental housing units. There is a match requirement of 25%.
	The Healthy Homes Supplement Funding	The Healthy Homes Supplement funding can be used to address lead in drinking water, provided the hazard is identified through the use of the Healthy Homes Rating System and any associated technical assessment results. Projects costing \$5,000 or greater require prior Government Technical Representative review and approval.

Funding Source	Funding Department and Grant Identifier	Funding Description
FEDERAL GRANTS	Department of Energy	
	Weatherization Assistance Program (WAP)	The WAP does not specifically fund lead hazard reductions, however, WAP funds weatherization work including repair and replacement of damaged windows and doors, which may mitigate lead-based paint hazards. WAP does not fund individuals directly. WAP provides funding for states, territories, and Native American tribes.
FEDERAL GRANTS	Economic Development Administration (EDA)	
	Economic Development Assistance Program, Public Works and Economic Adjustment Assistance Program	Provides strategic investments on a competitive merit basis to support economic development, foster job creation, and attract private investment in economically distressed areas of the United States. EDA solicits applications from applicants in order to provide investments that support construction, non-construction, technical assistance, and revolving loan fund projects.
FEDERAL GRANTS	Center for Disease Control (CDC)	
	Lead Poisoning Prevention – Childhood Lead Poisoning Prevention	The Centers for Disease Control and Prevention (CDC) funds cooperative agreements to support childhood lead poisoning prevention activities including: blood lead testing, surveillance, and targeted population-based interventions. This is a competitive grant that requires awardees to work closely with other agencies, partners, and other stakeholders serving children to ensure that a comprehensive system of referral, follow-up and evaluation is in place for lead-exposed children. This program does not fund removal of lead hazards like lead-based paints or lead containing pipes.

Funding Source	Funding Department and Grant Identifier	Funding Description
STATE GOVERNMENT GRANTS	State Administered, Indian Tribes, and Alaska Native Villages	
	Community Development Block Grants (CDBG)	Under the State CDBG Program, states award grants to smaller units of general local government that develop and preserve decent affordable housing, to provide services to the most vulnerable in our communities, and to create and retain jobs. 49 States and Puerto Rico participate in the State CDBG Program. HUD continues to administer the program for the non-entitled counties in the State of Hawaii. HUD distributes funds to each State based on a statutory formula which considers population, poverty, incidence of overcrowded housing, and age of housing. HUD does not provide CDBG assistance directly to individuals, businesses, nonprofit organizations, or other non-governmental entities.
	Arizona Arizona Department of Housing (ADOH)	ADOH administers CDBG and HOME funding for programs through units of local government and non-profit agencies that provide rehabilitation to certain property types owned and occupied as the primary residence of low-income homeowners.
	Maryland Maryland Department of Housing and Community Development – Lead Hazard Reduction Grant and Loan Program	The Maryland Department of Housing and Community Development provides funds to assist homeowners and landlords lessen the risk of lead poisoning and preserve the housing stock by reducing or eliminating lead-based paint hazards. Applicants must be: <ul style="list-style-type: none"> • A Maryland resident. If an owner-occupant the dwelling to be repaired must be a principal residence. • Residential rental properties and licensed residential childcare facilities. <p>There are no income limits for this program. The financial assistance provided (grant or loan) will be based on the applicant’s ability to repay.</p>

		Grants are available in certain target areas. This program funds lead hazard reduction activities in owner-occupied single-family homes and rental properties if the units meet the minimum program requirements.
Funding Source	Funding Dept. and Grant Identifier	Funding Description
STATE GOVERNMENT GRANTS		
	Massachusetts Assistance Program for Lead in School Drinking Water	This cooperative program helps Massachusetts public schools voluntarily test for lead and copper in drinking water. Under this program, the Massachusetts Department of Environmental Protection, along with program partners including the University of Massachusetts Amherst and the Massachusetts Water Resources Authority, provided technical assistance and lab analysis to help public schools sample their taps and water fountains, and to identify results that show lead and copper contamination over the action level. The Program includes an educational component that provided schools with the information necessary to establish and implement sampling programs, and to take remedial actions to address elevated lead and copper levels. Note that this program does not fund lead pipe removal.
	Michigan Department of Health and Human Services	Grants for lead safety work are available for repairs, which may include new windows, doors, painting, special cleaning or plumbing repairs. Owner occupied housing is eligible for an average of \$10,000 or more. Owners may be asked to pay a small fee. Landlords may be provided with an average of \$10,000 or more. Landlords will be asked to contribute a small portion of cost. There is no cost to tenants, but the landlord's permission is needed before starting work.
	New Hampshire New Hampshire Housing	Grants are available for the removal of hazardous lead paint from homes and apartments where a child under the age of six resides. The grant particularly

		<p>targets New Hampshire's pre-1978 housing, where lead-based paint hazards are much more likely to be found. The grant also targets those who are most in need, mainly low-income families and properties with: an "order of Lead Hazard Reduction," or owner-occupied units referred for an environmental investigation, or units occupied by a child with elevated blood lead levels, or units occupied by children under six years old or pregnant women.</p>
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Funding Source	Funding Department and Grant Identifier	Funding Description
STATE GOVERNMENT GRANTS		
	<p>New York</p> <p>New York State Energy Research and Development Authority (NYSERDA), Assisted Home Performance Program with Energy Star</p> <p>New York State Division of Housing and Community Renewal, HOME Program</p>	<p>The NYSERDA does not specifically fund lead hazard reductions, however, they fund weatherization work which may mitigate lead-based paint hazards.</p> <p>The Assisted Home Performance with Energy Star offers two incentives for eligible New York home owners. The first is a subsidy for up to \$4,000 to pay up to 50% of the total cost of the approved efficiency improvements in a one family home or \$8,000 in two-to-four unit residential homes with income-eligible residents. The second incentive offers low interest rate financing for the balance of the cost of the efficiency improvements through selected lenders. In older homes, high levels of lead based paint can be found in and around the windows. By removing old windows, you remove a high lead content from a home but also improve the energy efficiency with windows that are better sealed.</p> <p>The program provides funds to acquire, rehabilitate, or construct housing, or to provide assistance to low-income home-buyers and renters. Rehabilitation standards include: soil treatments for lead hazards, exterior lead hazards, lead-containing components, interior walls and ceilings, and hazardous materials.</p> <p>Funds may only be used for residential housing. Any private for-profit or not-for-profit entity that can demonstrate the capacity to develop and operate a qualifying project is eligible to apply for HOME</p>

		project funding. Units of general local government that have not been designated by HUD as participating jurisdictions and not-for-profit corporations that meet certain administrative tests may also apply as local program administrators. Jurisdictions which receive HOME program funding directly from the federal government may not apply for New York State HOME Program funds. All areas of the State are eligible.
Funding Source	Funding Department and Grant Identifier	Funding Description
STATE GOVERNMENT GRANTS		
	Ohio Ohio Healthy Homes and Lead Poisoning Prevention Program	The Ohio Department of Health’s Ohio Healthy Homes and Lead Poisoning Prevention Program (OHHLPP) was awarded more than \$2.9 million from the U.S. Department of Housing and Urban Development (HUD) to perform lead-hazard control work on properties housing one or more children less than six years of age. The grant enables OHHLPP to conduct lead hazard control and healthy homes work in 18 Ohio counties. Specifically, the funds are used for the identification of lead hazards in units occupied by children who have been lead poisoned or are at-risk of becoming lead poisoned; the remediation of the lead hazards through appropriate control or abatement procedures; and, ancillary activities such as training, outreach, and casework.

Funding Source	Funding Department and Grant Identifier	Funding Description
STATE GOVERNMENT GRANTS		
	<p>Wisconsin</p> <p>Wisconsin Department of Administration</p> <p>HOME Homebuyer and Rehabilitation Program</p>	<p>The Department of Administration (DOA) CDBG Housing Program works with qualifying homeowners to assess hazards in their homes, including lead service lines. The 0% interest loan would cover the costs for addressing all hazards, not just lead lines. Repayment on the loan is deferred until the home is sold or no longer the homeowner's primary residence.</p> <p>This program was established to provide essential home purchase assistance and necessary home rehabilitation, and other vital improvements for dwelling units occupied by low-and-moderate-income households. The source of funds is the U.S. Department of Housing and Urban Development (HUD) HOME Investment Partnerships Program (HOME), and the American Dream Down Payment Initiative (ADDI) program.</p> <p>The Wisconsin Department of Administration, Division of Housing awards these funds to local units of government (village, city, town, or county), the governing body of a federally-recognized American Indian tribe or band in the State of Wisconsin and local housing organizations, a public agency or nonprofit organization, or faith-based or religious organizations, as long as the funds are not used to support inherently religious activities. This program is on a biennial funding cycle.</p>
UTILITIES	Ordinances	
	Madison, WI Water Utility	<p>Madison's Common Council passed an ordinance that requires property owners to replace their side of a water service line if it is a lead pipe. The penalty for non-compliance was a fine of \$50-\$1000 per day. Property owners who refused to comply with the city's lead service replacement</p>

		<p>ordinance were turned over to the city attorney's office. Customers who discover a lead service line can still receive reimbursement for half the cost of replacement up to \$1,500. Customers can also apply for financing through the city to help pay for the remainder of the cost.</p> <p>The Wisconsin's Public Service Commission did not use rate-payer dollars to fund customer reimbursements, but the Madison Water Utility was able to use revenue generated by renting space on top of water towers to cell phone companies for their antennas.</p> <p>During the program, the entire cost to replace the private-side portion was \$1,340 on average. The average cost to replace the utility side during the program was \$1,997.</p>
<p>REBATES</p>		<p>There are utility rebate programs to promote installation of renewable energy sources, and energy efficient measures that can be used to finance lead remediation and replacement of windows, for example. Below is a list of two such programs.</p>
	<p>Boston, Massachusetts</p> <p>Boston Water and Sewer Commission(BWSC)</p>	<p>Boston property owners are eligible to participate in the Lead Replacement Incentive Program if all of the following conditions are met:</p> <ul style="list-style-type: none"> • The property is served by a two-inch or smaller water service pipe, which contains lead. • The water and sewer account for the property is active and not delinquent. • The property owner agrees to have the work done by BWSC, and the work presents no extraordinary physical obstacles. <p>The estimated cost of the private lead water service replacement will be determined after an initial review of the property. Eligible property owners may qualify for a credit of up to \$2,000 towards the cost of the replacement by enrolling in this program.</p> <p>Property owners will have the ability to pay for the lead service replacement either in a lump sum payment or interest-free over a 48-month period as part of the water and sewer bill.</p>

Funding Source	Funding Department and Grant Identifier	Funding Description
BOND MARKET		<p>States and local governments have the authority to issue tax-exempt and taxable bonds, including general obligation bonds, revenue bonds, and private activity bonds in order to raise funds to finance specific infrastructure needs. While most governmental bonds are issued for capital projects with a public purpose and are backed by the full faith and credit pledge of the issuer, or backed by a specific revenue pledge from the issuer, private activity bonds are issued by or on behalf of a state or local government as a means of providing special financing, most often for a private user, and are not backed by the pledge of the government. Private activity bonds can be issued by states in conjunction with the low-income housing tax credits as a financing source for lead remediation in affordable housing and historic rehabilitation projects. General obligation bonds can also be issued by either a state or local government for development, renovation, and preservation of affordable housing and any lead remediation work involved therein and for replacement of public lead service lines.</p>
LOANS		<p>Although there are some contracting companies who provide loans for lead removal as part of home improvement projects, there are better known public (federal and state) loan sources available as noted below.</p>
	<p>Drinking Water State Revolving Fund (DWSRF)</p>	<p>The DWSRF is a financial assistance program to help water systems and states to achieve the health protection objectives of the Safe Drinking Water Act. EPA awards grants to each state for their DWSRF based upon the results of the most recent Drinking Water Infrastructure Needs Survey and Assessment. The states contribute an additional 20% to match the federal grants. The DWSRF could be used to finance replacement of public lead service lines, or used to finance replacement of private lead service lines in privately owned community water systems as low-interest loans or principal forgiveness loans.</p>

	Federal Housing Authority 203k Refinance Loan	<p>This loan allows current homeowners the opportunity to rehabilitate and improve their homes. The FHA 203k Refinance Loan allows owners to cash out up to \$35,000 for the home improvement project, and the mortgage balance can exceed the current appraised value of the home.</p> <p>FHA 203k loans follow the eligibility guidelines of the standard FHA mortgage. Projects eligible for an FHA 203k Loan include projects for the removal of lead-based paint, and restoring windows or doors.</p>
	Title I Insured Loans for Property Improvements and Manufactured Housing	<p>Loans on single family homes may be used for alterations, repairs, and for site improvements. Loans on multifamily structures may be used only for building alteration and repairs. The property owner must have a good credit history and the ability to repay the loan in regular monthly payments. Both large and small improvements can be financed. A property owner may apply at any lender (bank, mortgage company, savings and loan association, credit union) that is approved to make Title I loans.</p>
	Mass Housing Get the Lead Out Loan Program (Massachusetts)	<p>Get the Lead Out loans are administered by local rehabilitation agencies. Owner-occupied properties are eligible for 0% deferred interest loans with no closing cost, the loan payments are deferred until sale or refinance of the property, flexible underwriting guidelines for owner occupant families of 1-4 in which a child under the age of six resides, or owner occupants who are court ordered to de-lead a property (must be child's permanent residence). Owner-occupants without a child under the age of six who opt for preventative lead abatement to increase the livability of their property must meet standard underwriting guidelines to take advantage of the 0% deferred rate.</p>

	Massachusetts Water Resources Authority (MWRA)	<p>The Local Water System Assistance Program provides up to \$100 million in 10-year zero-interest loans to communities solely for efforts to fully replace public lead service lines and private lead service lines from the community water main all the way to the home or business. Each community will develop its own program, tailored to their local circumstances. Eligible communities must be part of the MWRA. MWRA has a total of 50 water communities, of which 45 will be eligible for financial assistance under the Lead Service Line Replacement Loan Program.</p> <p>The interest-free loan will be repaid to the MWRA over a ten-year period, beginning one year after the original quarterly funding distribution date.</p>
	Wisconsin Department of Natural Resources (DNR), Environmental Loans Private Lead Service Line (LSL) Replacement Funding Program	<p>The Wisconsin DNR established a two-year program (SFY 2017 and SFY 2018) to assist disadvantaged municipalities in replacing lead service lines on private property for projects that result in full LSL replacements. Municipalities have three years from the date of their loan closing to expend funds for the LSL program. Funding for LSL replacement on private property is in the form of principal forgiveness, which means no debt is incurred for these funds. The program is intended to assist individuals in disadvantaged municipalities since user rates cannot be used to replace the private portion of the lead service line.</p>
LOCAL GOVERNMENT		
	Phoenix, Arizona Lead Hazard Control Program	<p>This program helps homeowners, landlords and tenants in targeted areas control hazards from lead in paint, soil and dust. Residents must have a low-to-moderate income level to qualify for assistance, the inhabitants must include a child under the age of six or pregnant resident, and the residence must have been constructed before 1978. The program is also a source of information about prevention of childhood lead poisoning.</p>
	Alameda County, California Community Development	<p>Free Lead Paint Repair Grants are available to owners of pre-1978 residential property in Alameda County. Some restrictions apply. The funds available through this program may only be used for lead hazard control and healthy homes work. Grants are</p>

	Agency, Free Lead Paint Repair Grants	given for up to \$10,000 per unit for lead hazard repair work.
	Colorado Springs, CO	<p>This program allows eligible homeowners located in the City of Colorado Springs to qualify for a grant or qualify for a 0% deferred payment loan to make necessary improvements to their home. The funds are primarily used to repair/replace substandard or failing housing conditions and make energy efficiency improvements. Improvements can include repairing or replacing a roof, windows, doors, hot water heater, furnace, flooring, plumbing, electrical and more. Lead-based paint testing may be performed on homes built before 1978.</p> <p>For these loans, monthly payments are NOT required, interest does not accrue, and the loan does not need to be paid back until there is a transfer of title (e.g. home is sold). The loan is immediately due and payable if the home is sold, ownership is transferred, the homeowner fails to occupy the property, or fails to pay property taxes or property insurance. Loans are secured by a Deed of Trust on the property.</p>
	Chicago, Illinois New Markets Tax Credit	<p>The program was designed to reduce childhood lead poisoning by making more than \$12 million available to replace windows and address other lead hazards in approximately 2,000 affordable rental units in apartment buildings in Chicago over two years from 2007 to 2009.</p> <p>The program combined a \$6 million grant from the City of Chicago Department of Public Health with \$6 million private capital raised by Delta Redevelopment Institute through federal New Market Tax Credits Program from five lenders and investors. A total of \$12 million was available to replace windows and remove deteriorating lead paint in more than 2,000 affordable housing units. The City funds originated from grants made by the United States Department of Housing and Urban Development.</p> <p>Qualifying landlords were able to borrow the required funds for approved lead abatement work, but once half the loan plus interest has been paid back, the other half would be forgiven. This not only</p>

		<p>removed the lead hazards from paint but also improved the energy efficiency of their buildings.</p> <p>The program was available to buildings with four or more units that offer affordable rents as defined by HUD. A lead hazard, defined as any chipping or peeling lead-based paint or lead-based paint on a friction surface, such as a window, had to be present in the building. The city inspected the buildings identified for the program for these hazards.</p> <p>During the program 10% of the \$12 million in public and private funds allocated to the program were spent and only 10% of the projected units were abated. This did not generate enough income to cover the cost of setting up and administering the program.</p>
	<p>Greensboro North Carolina</p> <p>Housing Rehabilitation Programs</p>	<p>Rehabilitation loans, both deferred and repayment loans are available at 3% interest for the actual cost of rehabilitation, but the cost of repairs cannot exceed \$43,400. Awardees can take up to 20 years to repay the loan.</p> <p>All homes constructed prior to 1978 will be tested for the existence of lead-based paint hazards. Any home that tests positive for lead-based paint may have a lead-paint remediation grant approved that will not exceed \$20,000. If the cost to remediate lead is greater than \$20,000, the additional cost would be a part of the rehabilitation loan and must be approved by the property owner.</p> <p>Loans for low income households will be made at a 3% interest rate with payment deferred until a change in owner's status. Moderate income households may finance rehabilitation costs through a 3% interest rate amortizing loan for a term of up to 20 years. All loans have a maximum amount of \$60,000. The maximum contract for actual rehabilitation work cannot exceed \$52,173.</p>
<p>RENTAL HOUSING IMPROVEMENT PROGRAM</p>		<p>The Rental Housing Improvement Program (RHIP) is designed to assist owners or purchasers of individual rental housing properties of seven or less units. The RHIP provides a deferred payments loan for a portion of the cost of rehabilitating eligible rental housing properties.</p> <p>All homes constructed prior to 1978 will be tested for the existence of lead-based paint hazards. Any</p>

		<p>home that tests positive for lead-based paint may have a lead-paint remediation grant approved that will not exceed \$20,000. If the cost to remediate lead is greater than \$20,000, the additional cost would be a part of the rehabilitation loan and must be approved by the property owner.</p> <p>All housing units must require a minimum of \$5,000.00 of structural or other code repairs to be eligible for assistance. All properties must be used exclusively for rental housing. Single housing conversions are not eligible. Condominiums, townhomes and manufactured homes that are held with a title and not a recorded deed are not eligible for program assistance.</p>
	<p>Dallas, Texas</p> <p>Home Repair Program</p>	<p>Eligible residents are located in the Dallas city limits, are purchasing or have owned their home for at least two years, have a household income less than the Applicable Median Family Income limits (80% less for repairs or reconstruction), pay property taxes and have current insurance, and have valid deeds. Repairs include all major systems such as roof, electrical, plumbing, heating, ventilation and air conditioning.</p> <ul style="list-style-type: none"> • Major System Repair – deferred loan which is forgiven a percentage annually as long as the owner remains in the home. • Reconstruction – a no-interest, deferred payment loan due upon death of borrower and/or at transfer of ownership. Amount due is the lesser of lien amount or 75% of market value as determined by the previous year’s Dallas County Appraisal District appraisal.
	<p>Boulder, Colorado</p> <p>Low Interest Home Repair Loan</p>	<p>Homeowners in the City of Boulder that need repairs can receive low-interest loans for health and safety repairs and energy conservation measures of up to \$25,000 for single family homes. Repayment of the loan is deferred for 15 years or until the awardee sells their home, whichever comes first.</p> <p>To qualify for home repair loans, the applicant must own and occupy the home, it must be the primary residence, and the applicant must live in the home</p>

		<p>for one year. The home must be located in the City of Boulder. The applicant must demonstrate a financial need. Applicant assets cannot exceed \$50,000 (excluding the value of the home). Some retirement assets are exempt. The amount of interest you are charged is based on your annual income.</p>
	<p>New York City</p> <p>Department of Housing Preservation and Development (HPD)</p> <p>Primary Prevention Program</p>	<p>This Program gives owners the means to make their buildings lead-safe through low-level interim treatment work. Treatment concentrates on friction surfaces - door jams, window sills and wells, and cabinets. The common areas and fire escapes are also treated. Buildings owners apply for forgivable loans valued at \$9,000 to \$10,000 per apartment, the average cost of lead treatment work. Some units may receive up to \$10,000 to \$11,000 in conjunction with other moderate rehabilitation work. Owners, in turn, hire contractors who are trained in EPA certified courses in lead treatment and HPD inspects the work.</p>
	<p>Washington DC</p> <p>Single Family Residential Rehabilitation Program (SFRRP)</p>	<p>Single Family Residential Rehabilitation Program (SFRRP) administers loans and/or grants for minor home repairs that address building code violations, repair roofs, remove threats to health and safety, and modify and/or eliminate barriers to accessibility for persons with mobility or other physical impairments.</p> <p>Under the SFRRP Program loans and grants, not to exceed a total of \$75,000, per household are available. The household identifies its own licensed and certified contractors to carry out the work subject to development of an initial scope of work and approval of the contractor's bid.</p> <p>The program provides financing through low or 0% amortized loans for up to 20 years and deferred loans (not payable until the home is sold, transferred or refinanced). Eligible applicants must own and live in their homes as their primary residence for at least three years, be current on all District and federal taxes, have an acceptable credit report and payment history, have current homeowner's insurance, and have household incomes that are no greater than the levels set by the program.</p>

TAX CREDITS		
	<p>Federal Tax Credits</p>	<p>While no federal tax credits (Tax Credits) (other than the New Market Tax Credits) were identified as an existing funding source, tax credits have been used within the federal and state tax structure to incentivize certain investments by individuals, businesses and investors.</p> <p>Tax credits directly offset the taxes payable by a qualifying entity, rather than reducing the taxable income, thereby allowing the entity to reduce the cost of the qualifying investment and recover the investment cost more quickly than otherwise possible under the tax code. Tax credits can be structured in two ways: 1) nonrefundable credits which are limited to the total taxes payable in the year of the tax credit's related expenditure and 2) refundable credits which are credited against current taxes with any residual tax credits paid to the taxpayer in addition to the full refund of any tax deductions and estimated tax payments. The latter is important when promoting investments by lower income individuals such as those that are often concentrated in older urban areas where lead exposure is more prevalent.</p> <p>Tax credits can be made available to individuals, businesses or investors. In the case of individuals, improvements such as lead line removal (potentially in conjunction with water utility efforts), lead paint removal or containment, point of use treatment systems, plumbing fixture replacements, among others could be financed by the property owner, whether owner occupied or rented. Similarly, businesses could make such investments for property it owns, whether owner occupied or rented. In such cases the most obvious approach would be a tax credit offsetting the individual or business taxes. Recognizing the concentration of lead exposure in older urban areas, which also typically see a concentration of poverty and lower income levels, the tax credit should be refundable to enhance the incentive for mitigation.</p> <p>With regard to investors, the primary tool would be tax credit bonds (TCBs). That approach involves</p>

		<p>either loans to or the purchase of publicly issued bonds from utilities for the sole purpose of lead mitigation. The banks and other financial institutions, as well as individual investors, would receive a tax credit to offset some or all of the taxable interest on the loans or TCBs and consequently accept lower interest rates on such loans or bonds, akin to tax exempt rates, making the lead mitigation efforts by a utility more economical and affordable. Alternatively, the tax credit could be paid to the utility as a direct offset to the taxable interest paid to the lender or bondholder, like the Build America Bonds (BABs) issued in 2009-10. It is also possible that a local bank or other financial institution could be incentivized by a tax credit to provide loans to homeowners and businesses in its service/market area for lead mitigation expenses, thereby driving down the multiyear impact to the borrower.</p> <p>The following appear to be potential barriers to the implementation of a tax credit program: tax credits will require Congressional approval which will raise budget and deficit considerations, the impact of the Federal Budget sequester has soured the attractiveness of BABs to the issuer (public) community, and while there has been much discussion about Public-Private Partnerships (P3s) for infrastructure investments, lead mitigation programs do not appear to be conducive to design-build-own-operate structures which are one of the bases for P3s.</p>
STATE TAX CREDITS		
	<p>Massachusetts</p> <p>Department of Revenue</p>	<p>Property owners who receive a Letter of Full Compliance are eligible for a State Tax Credit equal to the cost of the de-leading expenses, or \$1,500, whichever is less. To qualify as full compliance de-leading for purposes of claiming the de-leading credit, <u>all</u> of the following requirements must be met: a dangerous level of lead in the accessible structural materials of the residential premises is established by a licensed inspector, following de-leading by an authorized person the owner obtains a letter of compliance from a licensed inspector, and the owner completes Massachusetts Schedule LP and encloses it with the tax return</p>

		<p>Property owners who receive a Letter of Interim Control are eligible for a State Tax Credit of up to \$500. This \$500 amount applies toward the \$1,500 limit. To qualify as interim control for the purpose of claiming the de-leading credit, all of the following requirements must be met: 1) a dangerous level of lead in the accessible structural materials of the residential premises is established by a licensed risk assessor, 2) the premises are de-leaded using interim control measures performed by an authorized person, and the owner obtains a letter of interim control from a licensed risk assessor which certifies that the costs of instituting interim control measures are costs necessary to achieving full compliance, and 3) the owner completes Massachusetts Schedule LP and encloses it with the return. The owner should also retain the letter of interim control.</p> <p>Only "residential premises" qualify for the Lead Paint Tax credit, including single-family homes, individual units in an apartment building, condominium units (common areas and individual units), or individual units in multi-family homes. Owners are entitled to claim a Lead Paint Tax Credit in the taxable year in which compliance is certified or in the year in which the payment for the de-leading occurs, whichever is later. Nonresidents and part-year residents qualify for this credit only if the property is residential and located in Massachusetts. This property does not need to be a principal residence located in Massachusetts.</p>
	<p>Rhode Island Division of Taxation</p>	<p>An individual is entitled to a credit against his or her Rhode Island personal income tax liability for residential lead removal or lead hazard reduction if he or she: obtains a housing resources commission regulated certificate of conformance for mitigation, or obtains a department of health regulated lead safe certificate.</p> <p>The tax credit is equal to the amount actually paid for the required lead removal or lead hazard reduction up to a maximum of \$1,500 per dwelling unit for mitigation and up to \$5,000 for abatement. Each Claimant may only claim relief for mitigation or</p>

		<p>abatement efforts for three separate dwelling units. A "dwelling unit" means a single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking, and sanitation.</p> <p>Credit distributions will be provided first to claimants with a household income of \$35,200 or less during the year for which the claim was filed. The household income amount will be increased July 1st of each year by a percentage equal to the cost of living adjustment provided for social security recipients. Secondly, distributions will be provided to claimants who rent or lease dwelling units to individuals whose household income was \$35,200 or less during the year for which the claim was filed. The household income amount will be increased July 1st of each year by a percentage equal to the cost of living adjustment provided for social security recipients. All other claims will be paid once all applicants listed above have been paid.</p>
INFRASTRUCTURE TRUST		
	<p>Chicago, Illinois</p> <p>Infrastructure Trust</p>	<p>The Chicago Infrastructure Trust was created in April 2012 by executive order of Mayor Emanuel and City Council resolution. The Trust's purpose is to assist the people of the City of Chicago, the City government and its sister agencies in providing alternative financing and project delivery options for transformative infrastructure projects. The Trust provides focus and leadership to maintain a pipeline of executable projects that will meet Chicago's infrastructure needs and attract private investment. The Trust could be used to finance lead remediation projects.</p> <p>The Chicago Infrastructure Trust pursues projects that leverage private sector resources through alternate financing and procurement methodologies such as joint ventures, private equity, public private partnership (P3) investments, and state, federal and private grants. The benefit of alternate financing and procurement methodologies is that they enable Chicago to address infrastructure needs beyond the capacity of public funding sources.</p>
	New Jersey	NJEIT is a partnership between the New Jersey Environmental Infrastructure Trust (NJEIT) and the

	<p>Environmental Infrastructure Financing Program (NJEIFP)</p>	<p>New Jersey Department of Environmental Protection (DEP). NJEIFP eligibility consists of two components:</p> <ul style="list-style-type: none"> • The project sponsor must (a) be either a local government unit or hold a permit to operate a public water system and (b) satisfy the program’s credit worthiness requirements. • The project must (a) be a clean water or drinking water project as set forth in the Program Funding Tab above and (b) satisfy NJEIFP program requirements. <p>Short-term loan interest rates are 0% for terms up to three fiscal years. Long-term loan interest rates vary but the majority is equal to 25% of the market rate. The effective interest rate for a majority of long-term loans issued in May of 2016 was 0.59% for terms of up to 30 years.</p> <p>Eligibility applies to projects that address federal safe drinking water health standards. This includes replacement, source development and rehabilitation, treatment to comply with primary/secondary drinking water standards, storage to prevent contamination from entering the water system and transmission lines/distribution systems to prevent contamination or to improve pressure to safe levels.</p>
<p>Philanthropic Organizations/NGOs</p>		
	<p>Rebuild Together</p>	<p><i>Rebuild Together</i> has a network of local affiliates that provide free home repairs to low income home owners, which can include removal of lead-based paint as part of the repairs. Each local affiliate has its own eligibility requirements and application process.</p>

		<p>Many sources of funding are not specifically targeted to lead hazard reductions but fund activities that can reduce exposure to lead (e.g. window replacements performed under a grant targeted at energy efficiency may reduce exposure to lead by removing deteriorating paint on window frames). The sources of funding are diverse, covering loans, grants, tax credits, etc. on the federal, state, and local government levels. Majority of the funding sources are specifically for low-income home owners. There appears to be fewer funding sources for public spaces such as schools and hospitals.</p>

Appendix B: Summary of Financing Alternatives Based Upon a Number of the Criteria for Both Providers of Capital and the Borrowers/Owners

Criteria	Environmental Impact Funds	Revolving Loan Funds	HUD/Related Financing	Institutional Debt	Tax Credits
Sponsor/Borrower Criteria					
Low Cost of Capital		X	X		X
Eases Cash Flow		X	X	X	
Ease of Application		X	X	X	X
Increases Value			X	X	
Collateral Required			X	X	
Delay Associated with Program		X	X		
Program/Lender Criteria					
Existing Program for Lead Exposure Reduction		X	X	X	
Existing Concept for Lead Exposure Reduction	X				X
Financial Underwriting	X	X	X	X	
Creditor Underwriting	X	X	X	X	
Collateral Underwriting	X		X	X	
Available to Small Users		X		X	X
Investment Expectation (L/M/H)	H	L	L	M	L

Appendix C: Significant Case Studies

New England

New England states have some of the oldest housing in the United States. Over one-third of New England housing was built before 1950, and this is where deteriorating lead-based paint is most likely to exist (Source: U.S. Census Bureau, 2010-2014 American Community Survey 5-Year Estimates).

City/State: Massachusetts

Issue: Lead Paint Law

Background: Massachusetts has one of the strictest lead paint laws in the United States. Under the Massachusetts Lead Paint Law, buyers of property are entitled to have the property inspected, and the law imposes a mandatory obligation to de-lead if there is a child under six-years-old residing in the rental premises. A property owner or real estate agent cannot get around the law simply by refusing to rent to families with young children. They cannot refuse to renew a lease to a pregnant woman or a family with young children just because a property may contain lead hazards. This would be a violation of the Lead Law, resulting in serious penalties.

Financing/Funding Approach: There are several programs that offer financial assistance for de-leading such as a lead paint removal tax credit to those property owners who receive a Letter of Full Compliance that is equal to the cost of de-leading expenses or \$1,500, whichever is less. Only residential premises qualify for this tax credit. Massachusetts also offers a program called “Get the Lead Out” that provides low cost financing to owners of 1-4 family properties to remove lead paint. For owner occupants who meet the income guidelines, they can receive a 0% deferred payment loan not due until the sale, transfer or refinancing of the property. Non-profits are eligible for 0% fully amortized loans for properties being rented to income eligible households. Investor owners are eligible for 3% fully amortizing loans on properties that are being rented to income eligible households.

Also available is a Home Improvement Loan Program (HILP) that offers low interest loans to de-lead owner occupied family homes and residential condominiums that have been the borrower’s principal residence for a minimum of one year. The loans range from a minimum of \$5,000 to a maximum of \$25,000 per home for a loan term of 5-15 years.

Effectiveness: The effectiveness of this program was not available for this report.

Concerns or Barriers: Only a small percentage of homes built prior to 1978 have been inspected and/or de-leaded. Although the mandate calls for stripping dangerous levels of lead from houses with young children, residences that have been deemed lead-safe do not stay that way forever.

Case Study Takeaway: Even though Massachusetts is considered to be one of the strictest states when it comes to lead paint and best financing for de-leading, there are still several cities, including Boston, that still struggle with high incidences of lead poisoning.

Program Links:

https://www.masshousing.com/portal/server.pt/community/home_owner_loans/228/get_the_lead_out

City/State: Rhode Island

Issue: Lead Paint

Background: The Ocean State is home to many historic and older homes, with about 70% of housing stock built before 1978. Rhode Island is unique for taking a daring step in 2006 by suing the paint industry to seek money for lead paint mitigation. At one point, Providence, Rhode Island was even dubbed the lead paint capital of the United States. It was a landmark case lawsuit that was later overturned, citing that the paint industry could not be held responsible. In 1999, when Rhode Island first sued, more than 2,300 children under six-years-old were found to have dangerously elevated levels of lead. By 2014, the number dropped to 217, or just less than 1 percent of all children tested statewide. But this is still 40% above the national rate.

Financing/Funding Approach: The LeadSafe Homes Program provides forgivable loans to mitigate the hazards of lead-based paint. It is available to homeowners and landlords at no cost to qualifying customers. Funding is forgiven after five years for homeowners and after ten years for rental investment properties. The program started by a competitive grant given to Rhode Island Housing by the US Department of Housing and Urban Development (HUD) since 1998. This grant is very precise about how the program should be run, and also requires a 10% match from Rhode Island State.

Effectiveness: This is a very popular and well managed program. It has been very effective in mitigation efforts and uses the payback to ensure there is money to continue the program if federal funding becomes reduced or eliminated.

Concerns or Barriers: To manage the LeadSafe program, Rhode Island relies on federal funds. Although the program is well organized and effectively managed, the loss of federal grant funding will significantly impact the program and will require them to utilize only the funds available from loans being paid back. Rhode Island was hard hit by the economic crisis of 2009 and lost much of the anticipated loan repayment due to many short sales on the housing stock, so not as much is available as originally anticipated. Without federal funding, this program will be forced to change the program requirements to possibly those with elevated lead poisoning tests or severely restrict eligibility.

Case Study Takeaway: This program is noteworthy because of the partners involved in providing the effective education and outreach efforts that are part of the program. Although they run their program with federal funds, they are unique in offering a loan program to put money back into the program instead of issuing a grant like many other states do with their HUD funding.

Program Links: http://loans.rhodeislandhousing.org/LeadSafe_Homes/

Northeastern Region

City/State: Cincinnati, Ohio

Issue: Replacing lead service lines in the City of Cincinnati to prevent drinking water contamination.

Background: Although the City of Cincinnati stopped installing lead service lines in 1927, approximately 15,000 lead service lines remain on the public side and as many as 27,000 may remain on the private side. GCWW has been removing lead service lines from the water system since 1971 through a partial lead service line removal program in association with its water main capital improvement program. Since this program only removes the public portion of the lead service line, GCWW has encouraged customers to remove the private portion of the line. However, the cost to remove the private portion of the line (averaging \$3,000 per line), City's Municipal Code limitations to ownership, and affordability have been the biggest obstacles to private line removal and improved drinking water quality.

In response to recent research documenting the health risks of partial lead service line removal, GCWW provides filter pitcher kits to customers impacted by public lead service line replacement due to a water

main replacement or a leaking line. In addition, GCWW created an Enhanced Lead Program in 2016 and assigned a program manager to unify all initiatives under the Enhanced Lead Program, including water sampling and testing, communications and outreach, lead service line replacement, records, information technology, and customer service.

Financing/Funding Approach: GCWW has a long-term goal to replace all publicly owned lead service lines over time through its Capital Improvement Program and to help establish programs to assist customers to remove their portion of the service lines within the same timeframe. In 2016, as part of the Enhanced Lead Program, the City of Cincinnati Council approved GCWW expanding its current Capital Improvement Program budget to include projects dedicated to removing lead service lines, rather than just replacing the public portion of the lines when water mains are replaced or service line leakage is identified.

This accelerated public lead service line replacement program is a 15-year capital improvement program with \$9.7 million estimated to be budgeted annually for this program. In addition, GCWW plans on incentivizing property owners to voluntarily replace the private portions of their service lines with a combination of grants and loans. GCWW would either remove the private lead service line with its own contractor or coordinate with the property owner's contractor who would do the private portion replacement work. GCWW would also have a list of approved contractors for the property owners to contact should they perform the work themselves.

To fund the private portions of the lead service lines with grants and loans, GCWW plans to establish a new fund that will be capitalized from capital-related surplus monies funded from revenues. This fund will be utilized to provide both grants and loans to customers for this program. Customers will have the option to fund the non-grant portion on their own. A revolving loan program will be established utilizing this fund. Property owners will be responsible for repaying their loans into the fund through special property tax assessments on their tax bills.

Effectiveness: The GCWW private lead service line replacement program is still under development. If the private lead service replacement funding program is approved later this year by City Council, it will offer grants and up to ten-year loans to all GCWW customers with lead service lines. GCWW intends to offer a greater proportion of grant funding to qualifying senior citizens and low-income customers.

Concerns or Barriers: As mentioned above, GCWW intends to capitalize the public portion of the lead service line replacement. A financial consideration for GCWW is to ensure that it maintains sufficient liquidity for the utility after the transfer of the capital-related surplus monies to this new fund. Repayment of special property tax assessments will go back into the revolving loan fund. Another consideration is the ability of any utility with outstanding debt to transfer monies out of its indenture for this purpose. Given the criticality of ensuring the provision of safe drinking water to its customers, the City and GCWW have concluded that this is a lawful public water system purpose.

Program Links:

<http://www.cincinnati-oh.gov/water/lead-information/>

<http://www.cincinnati-oh.gov/water/lead-information/links-and-additional-information/>

City/State: New York City

Issue: New York City and its borough's face issues with lead levels in school drinking water, including lead levels in school drinking water and drinking water in household plumbing that exceed EPA guidelines.

Background: Under Mayor de Blasio's administration New York has accomplished remediation removal of 500 properties throughout Brooklyn, Queens, Manhattan, The Bronx, and Staten Island. These five boroughs with a land coverage total of 138 acres include 300 underground storage tanks. This remediation process began in 2014, and is still underway. On Earth Day April 22, 2017, these accomplishments were shared through media sources.

Financing/ Funding Approach: Collaborative efforts were undertaken, Public Private Partnerships established, with a private investment that represented 8.2 billion in new construction and funding from the NYC Office of Environmental Remediation for new pre-development grants.

Effectiveness: All work to date has been accomplished 18 months ahead of schedule with a current 75% completion rate.

Concerns or Barriers: Not Available. Information was not available on concerns with these various projects and whether they directly addressed lead abatement.

Case Study Takeaway: The New York City Office of Environmental Remediation and NYC Volunteer Cleanup Program have a collaborative agreement with New York State, which allowed for the cleanup of 577 formerly blighted lots in need of remediation, vacant for over 10 years, and located predominately in New York City flood zones. The New York Volunteer Cleanup Program as of December 2015 has enrolled 375 cleanup projects, creating over 10 billion in private investment. The cleanup programs have thus far created 3,700 permanent jobs and 3,600 affordable housing spaces, creating tax revenue estimated to be more than \$960 million. The recycling of soil is included in the land abatement process. However, there was no direct mention of lead removal contained in the information.

Summary: The information regarding the New York City and its boroughs clean-up program has many benefits to the community, including increased access to affordable housing, removal of blight in communities through the lead cleanups, new job creation and retention, and increased tax revenue for the City, but does not mention addressing lead abatement specifically.

Unfortunately, there appears to be no successful lead abatement project in the school systems, especially within the NYC school district system. There are numerous articles on the high levels of lead in the schools, providing locators to a specific school for review. Reports located do not show cases of lead abatement being started or accomplished within the school system.

Similar procedures for financing, funding, and collaborative efforts could be developed and accomplished to address the lead issues within the school system by creating public private partnerships focused on accomplishing long-term new job creation and sustainability within the various NYC communities.

Program Links:

<http://www1.nyc.gov/office-of-the-mayor/news/237-17/onenyc-mayor-environmental-remediation-500th-property-achievement-75-goal>

<http://www.nyc.gov/html/oer/html/home/home.shtml>

<http://www1.nyc.gov/site/hpd/about/press-releases/2017/04/04-18-17.page>

New York City Environmental Resource Page <http://www1.nyc.gov/nyc-resources/categories/environment/environmental-protection/index.page>

NYC Interactive Capital Projects Dashboard <http://www.nyc.gov/html/ops/capital/html/map/map.shtml>

https://www.nytimes.com/2016/09/01/nyregion/lead-tests-on-new-york-city-schools-water-may-have-masked-scope-of-risk.html?_r=0

<http://www.wnyc.org/story/wnyc-map-lead-contamination-water-fountains-nyc-public-schools/>

City/State: New Jersey (Trenton and Newark)

Issue: Aging infrastructure leads to higher lead levels that were found in low income housing and some area schools.

Background: Lead contamination of the drinking water in some New Jersey schools has raised concerns about New Jersey's aging water infrastructure. State lawmakers are considering forming a task force to study what improvements the water system needs. The Utility and Transportation Contractors Association agrees that this study would be extremely valuable to ensure water quality over the long term. Lead contamination was found in the drinking water supply at dozens of schools in the state's largest school district, and now federal funding to help remediate lead hazards in low-income housing are headed to the city. Newark and Trenton are two of 11 cities in New Jersey recently found to have a high proportion of young children with elevated blood lead levels.

Financing / Funding Approach: Funding for the infrastructure improvements, in part, will be relied upon by the ratepayers. There is already in place an Environmental Infrastructure Trust that can fund some of the cost. Trenton and Newark, NJ are to receive millions of dollars in federal funding from the Department of Housing and Urban Development (HUD) to help combat the lead issue. This funding is being awarded from the Lead Hazard Reduction Demonstration program. The program granted Newark \$3 million, and the city picked up an additional \$400,000 from Healthy Homes Supplemental funding. Trenton received a little over \$2.1 million to assist with the reduction of lead in the homes.

Concerns or Barriers: It is noted that about 25% of the water in urban areas leaks out of old pipes. There is a concern that the leaking can reduce the flow from taps if there is not enough water in reservoirs in the summertime to make up for it. Replacing all the old pipes would cost billions. The funds will only remediate lead hazards in 150 low-income housing units in Newark, and 145 in Trenton. There are nine more cities that need assistance. Although the issues in the schools are not severe, it still causes stress on the families concerned about the health of their children.

Case Study Takeaways: Federal funding is critical in enhancing efforts in Newark and Trenton to reduce lead hazards in public schools, public housing, and making certain the homes are safer for residents in the area. In the state of New Jersey, children in 11 cities were reported to have higher blood lead levels than those children in Flint, Michigan, which experts said was in large part caused by exposure to paint in old homes. The known potential health impacts of lead poisoning can be devastating to a child, so having an obligation to secure the resources needed to update the aging housing and infrastructure in these communities is necessary.

Lead was also found in some schools' drinking water. This will prompt several legislation proposals that would require more testing and provide funding to remediate lead issues. Experts have sited that the amount of exposure through paint in the home is at a much higher rate than through the amounts found in some schools' drinking water. There is a lot more to do in terms of providing the necessary funding to replace lead pipes, not only in the public utility sites but the private homes and public buildings as well.

Program Links: <http://www.newsworks.org/index.php/local/new-jersey/93500-new-jersey-considers-study-of-aging-water-infrastructure>

http://www.nj.com/essex/index.ssf/2016/06/millions_of_federal_dollars_headed_to_newark_trent.html

Mid-Atlantic Region

City/State: Pittsburgh, Pennsylvania

Issue: Replacing lead service lines to prevent drinking water contamination.

Background: Pittsburgh exceeded the lead limit for the first time in July 2016. The City's water authority has nearly \$1 billion in debt. Pittsburgh suffers from decades of inadequate maintenance of their infrastructure, leading to periodic pipes breaking and significant signs of disrepair. Although there is currently no detectable lead in the water, the Pittsburgh Water and Sewer Authority (PWSA) are concerned about lead being picked up in corroded service lines that carry water from the mains beneath the street into residences and from soldered pipe joints and interior plumbing. It is estimated that 25% of its 80,000 PWSA customers get their water through lead service lines, and the City is unsure of exactly where many of those lines are located. To prevent an immediate health crisis from occurring, water filters will be given first to residents whose lines test at or above 10 ppb for lead, and then to other homes, schools, and community centers while PWSA begins replacing lines.

Financing/ Funding Approach: The anticipated total cost to solve the city's problem is in the hundreds of millions of dollars. A first step in a long-term solution will begin with the "Safe Water Plan" program, which will spend \$1 million to provide free lead filters to every PWSA and Pennsylvania American Water Co. customer in the city. Peoples Natural Gas has volunteered to pay for half of the initial \$1 million program costs in a joint venture, with the city and PWSA each paying a quarter of the remaining costs.

Along with the free filters, the Urban Redevelopment Authority (URA) of Pittsburgh is looking to restructure and borrow \$1.5 billion to upgrade its water system, and will spend an estimated \$411 million over the next ten years to replace the city's lead pipes. URA is also proposing a "Replace Old Lead Line Program" that will spend \$500,000 in loans to low-income property owners at 3% interest to cover the costs of replacing their lead service lines. The average cost of replacing a service line ranges from \$3,000 to more than \$10,000. The PWSA is expected to annually replace an estimated 1,450 lead service lines it owns and in the public right of way.

Effectiveness: The programs in Pittsburgh are new and are just beginning implementation. If the URA loan program is approved, it will offer loans up to \$10,000 with repayment schedules up to 10 years. The program would be offered to borrowers with incomes below 120% of the area median income.

Concerns or Barriers: There is some opposition raised about charging low interest instead of no interest, as the burden would be on low-income families. There are questions about the County health department data that shows a decline in the percentage of children in Pittsburgh with elevated blood-lead levels and an audit will be done to confirm that it is not the progress made in cleaning up lead paint that could potentially be concealing the effects of lead in the water. Criticism of Pittsburgh officials has been expressed regarding the city's plans to replace only the public portion of the lead service lines as the disruption can cause more lead to be released from the remaining lead pipes.

Case Study Takeaway: Pittsburgh is trying to be proactive in their approach before the situation escalates to a major public health crisis. The city has a very expensive problem and is working with multiple entities to finance a solution. A notable aspect of this case is their efforts have a special program targeted to helping low-income families pay for the replacement.

Program Links: <http://pittsburghpa.gov/safepgh2o/>

City/State: Washington, DC

Issue: Replacing lead service lines in the District of Columbia (the “District”) to reduce the ingestion of lead through drinking water.

Background: In 2003, EPA directed DC Water to replace lead service lines at a rate of 7% per year. From 2003 to 2007, lead service replacement work was focused in locations/areas with higher concentrations of these lines. The public portions of all customer lead service lines on entire blocks were replaced to maximize removal of these lead service lines. In these cases, homeowners were given the opportunity to replace the private portion of the service line in conjunction with the replacement of the public portion of the service line. Lead service lines were also replaced in conjunction with emergency water main and sewer lateral repairs. In these instances, lead service replacements were limited to the public portion of the service line which ends at the property line.

In 2008, in response to research indicating that partial lead service line replacements are not effective in reducing lead levels over the short term at the tap, the accelerated replacement program was discontinued and the approved approach recommended (1) lead service replacements in conjunction with DC Water’s water main replacement/rehabilitation projects, (2) full lead service replacements only - ahead of DDOT’s Paving Schedule, and (3) public-side replacements through customer initiated requests (customer provides documentation that private-side had been or will be replaced). This program allows for full lead service replacements at properties where the owner wants to replace their lead service line but the address is not scheduled to receive service line replacement under any other DC Water capital improvement project (the “Demand/Voluntary Program”).

In 2009, DC Water modified its lead service line replacement policy to encourage full line replacements and to save costs. Under the modified policy, DC Water agreed to continue to replace the public portion of the lead service line with copper tubing in conjunction with water main replacement projects, where the water service must be replaced to connect to the new water main. The Demand/Voluntary Program was continued. When DC Water performs a lead service line replacement (full or partial), the utility provides the customer with pitcher filters and cartridges for a six-month period as a precautionary measure to mitigate initial increased levels of lead, which taper off in a few months. For partial replacements, DC Water also conducts extensive outreach to encourage flushing and use of filters for six months after the replacement.

Financing/Funding Approach: Since the inception of the lead line replacement program through September 30, 2016, DC Water has expended \$151.8 million on its lead service line (public portion) replacement program and currently has \$18.5 million budgeted in its Fiscal Year 2017 – 2026 Capital Improvement Program. DC Water currently estimates that there is approximately \$300 million of lead service line replacement work left to do in the District for just the public portion of the lines.

To encourage full lead service line replacement, DC Water offers homeowners the opportunity to replace the private portion of the lead service line at a special rate in conjunction with the public portion replacement. DC Water competitively bids the work and contracts with a company to do the work. The rates offered by DC Water often result in savings on permitting and work coordination with the contractor. The property owner can get estimates from other contractors to compare costs. The DC Water contractor rate is \$100 per foot of pipe replaced on private property plus \$500 to connect inside the house. DC Water provides payment options for this work, including full payment prior to the work, full payment after the work is completed, and four monthly payment installments. For the Demand/Voluntary Program where the private-side replacement work is solely negotiated between the homeowner and the contractor, the prices are slightly higher. We have been informed by homeowners that the contractor is charging \$125 per foot of pipe that needs to be replaced, plus a \$600 penetration

charge. DC Water is not involved (other than to have the data reported back to the utility to update its database). In the vast majority of cases, these costs are still significantly lower than if an outside plumber/contractor were used. Under both alternatives, DC Water will also send an inspector free of charge to inspect the work at the property, including in the home.

Effectiveness: DC Water's special rate offer to property owners has helped increase the amount of private portion lead service line replacement work that has been done in the District. The level of interest has varied considerably by neighborhood with the wealthier neighborhoods experiencing higher levels of subscription. DC Water estimates that the higher income areas have had over 40% subscription levels while the lower income areas have had less than 20% subscription levels.

Concerns or Barriers: DC Water has not implemented a program yet to provide increased financial assistance to lower income customers to facilitate the replacement of their portion of the lead service lines. The current special rate incentives have not been large enough to address the cost of these replacements from an affordability perspective, as evidenced by the lower than desired participation rates. In addition, the District still has a significant number of lead service lines that have not been replaced, as reflected by the \$300 million DC Water estimate of remaining work on the public portion of these lines.

Program Links: <https://www.dewater.com/lead-pipe-replacement> <https://www.dewater.com/lead>

Midwestern Region

City/State: Flint, Michigan

Issue: Replacing lead service lines to prevent drinking water contamination.

Background: In 2015, the drinking water in Flint became contaminated with lead after the city changed its water source and failed to guard against pipe corrosion. To date, residents are still advised to drink only filtered tap water or bottled water. Flint has replaced 850 of an estimated 20,000 lead and galvanized steel residential water lines with copper piping since last year and plans to replace 6,000 water lines in 2017, finishing all replacements by 2020. The City provides free bottled water and water filters and Michigan has spent \$167 million since 2015 trying to address their health and infrastructure issues from the lead crisis.

Financing/ Funding Approach: Michigan's legislature voted to send \$100 million in federal funds to Flint for lead pipe replacement and other infrastructure upgrades. Most of their replacement plans are being paid through federal and state funding, but it will not be enough to alleviate Flint's water crisis. To complete the lead replacement by the end of 2019, \$70 million more will be needed, much of which may have to be passed down to residents.

Effectiveness: Flint is probably the most well-known case study regarding lead pipes resulting in drinking water contamination. Their situation brought national attention to the issue and raised the profile of lead in water issues across the country. It also spurred greater scrutiny from regulators as well as pressure from residents to reduce lead in drinking water. The analysis of what went wrong serves as guidance on remediation and recommended policies for other states.

Concerns or Barriers: Flint is replacing the lead pipes and switching to the Karegnondi Water Authority, but there are still major concerns with the way the city originally handled this crisis and whether they are equipped to take back responsibility. Even with lead levels decreasing and improvements being made, the water is still not safe to drink without a filter, and it is recommended still that residents drink bottled water. Many people are either home bound or lack proper transportation to go to pick up

stations to get bottled water. The effects of this crisis will linger for some time, including a general lack of confidence in the government to handle the situation that still exists.

Case Study Takeaway: The story in Flint showed many things, including that many cities do not know where their lead pipes are buried so replacement is not easy with financing in hand. Flint also brought recognition that too few children in Michigan are screened for lead through routine blood tests, investments in education and public health are critical, coordination and good communication are vital, and follow-up on children with elevated blood levels is imperative.

Program Links: <http://www.cnn.com/2016/03/04/us/flint-water-crisis-fast-facts/>

City/State: Illinois

Issue: Replacing lead service lines in Illinois' disadvantaged communities to prevent drinking water contamination.

Background: The federal capitalization grant for drinking water state revolving fund programs requires that 20% of the available funds be used to provide additional subsidization for eligible loan recipients in the form of principal loan forgiveness. In addition to providing additional subsidy to disadvantaged communities, the Illinois EPA Bureau of Water is currently utilizing its principal forgiveness capacity to fund projects that reduce or eliminate lead from potable water by removing and replacing lead service lines and related equipment and appurtenances that are likely sources of lead contamination. To qualify, a public water system must have lead service lines connected to its system, currently at the time of application be on an increased lead monitoring schedule which requires sample collection every six months, and have a history of two or more lead action level exceedances.

Financing / Funding Approach: Lead service line replacement ("LSLR") principal forgiveness is available for all applicants up to a maximum amount of \$4,000,000 for communities with a median household income ("MHI") less than 70% of the State average. MHIs are based on the 2010 – 2014 American Community Survey 5 Year Estimates released in December 2015. For other recipients, principal forgiveness is available up to 50% of the initial loan amount up to a maximum amount of \$1,000,000. LSLR principal forgiveness is available for State FY2017 loan recipients until all allotted funds are expended. Any remaining funds may be expended for non LSLR disadvantaged community principal forgiveness.

Concerns or Barriers: No concerns or barriers. This program is focused on the public portion of community lead service lines. The private portion of lead service lines is not funded by this program.

Program Link: <http://www.epa.illinois.gov/topics/grants-loans/state-revolving-fund/postings/index> (2017 Public Water Supply Loan Program Intended Use Plan and Project Priority List)

City/State: Illinois

Issue: Drinking water lead testing in Illinois schools and day care centers.

Background: Legislation was passed in January 2017 by Governor Bruce Rauner requiring day care centers constructed before 2000 that serve children under six and schools with students up to fifth grade built before 2000 to test every tap for lead in drinking water as well as water used for cooking in schools. Under the law, Illinois schools built before 1987 are required to test before the end of 2017. Those constructed between 1987 and 2000 have until the end of 2018 to test. Taps that have been tested after 2013 will not have to be tested again. To obtain a waiver from additional testing, the testing

method and results must be submitted to the Illinois Department of Public Health for approval. According to the Illinois Environmental Council and Illinois Attorney General Lisa Madigan's office, approximately 2,500 schools and 11,000 licensed day care centers could be affected by the law. The state's largest school district, Chicago Public Schools, has already conducted lead testing.

Financing/Funding Approach: The legislation requires day care centers and schools to pay for their own lead testing, rather than water suppliers. The cost of testing for each school could range from \$500 to \$5,000. This cost could increase if lead is present and mitigation is required. The legislation enables schools to access monies available in tort immunity and life safety health funds for lead testing.

Concerns or Barriers: The legislation mandates lead testing in day care centers and schools that are at the greatest risk of having lead in water supplies. The legislation does not address a source of funds for any day care centers or schools that find excess lead levels and need to mitigate the exposure.

Program Links:

<http://www.chicagotribune.com/news/ct-rauner-school-lead-testing-law-20170116-story.html>

www.chicagotribune.com/news/.../ct-lead-testing-schools-met-20170110-story.html

www.politico.com/.../illinois/.../major-deal-reached-requiring-lead-testing-in-illinois-s

City/State: Chicago, Illinois

Issue: Lead Paint

Background: At one point in time, Illinois led the nation in the number of children identified as lead poisoned. It was estimated that more than 81,000 children in Illinois were harmed by lead each year. In Chicago, approximately 88,000 units of lead-contaminated housing were at risk for poisoning children. 55,000 of these units were in multi-family buildings.

Financing/ Funding Approach: A program was designed to reduce childhood lead poisoning by making more than \$12 million available to replace windows and address other lead hazards in approximately 2,000 affordable rental units in apartment buildings in Chicago over two years from 2007 to 2009. The program combined a \$6 million grant from the City of Chicago Department of Public Health with \$6 million private capital raised by Delta Redevelopment Institute through federal New Market Tax Credits Program from five lenders and investors. City funds originated from grants made by the United States Department of Housing and Urban Development. Qualifying landlords could borrow the required funds for approved lead abatement work, but once half the loan plus interest has been paid back, the other half would be forgiven.

Concerns or Barriers: There were many concerns and barriers to this program, including a complex screening process, a time-consuming application, limited capacity to manage all aspects of the program, weather conditions for installment, change in leadership, and the bankruptcy of a parent company to the lead abatement service company. In the end, only 10% of the \$12 million in public and private funds allocated to the program were spent and only 10% of the projected units were abated.

This did not generate enough income to cover the cost of setting up and administering the program. The program ended in the early days of the financial crisis and some borrowers defaulted on their loans. As the real estate market has slowly recovered some delinquent borrowers have paid off their loans to clear the lien and sell their property.

Case Study Takeaway: The New Market Tax Credits were used as a leveraging tool to help the City use its \$6 million grant to address the problem of lead abatement in multi-family buildings and double the

number of units that would receive abatement services. The use of New Market Tax Credits was significant because it provided a model for public/private partnership to raise private capital to address this problem. New Markets Tax Credits are a source of private investment capital for lead abatement if they are used to fund qualified businesses that provide lead abatement services. Public sector (HUD) lead abatement grant requirements do not mesh well with private financing from either a marketing (demand) or underwriting point of view. The energy efficiency benefits of window replacement were an important inducement to building owners to participate in the lead abatement program. Charitable organizations crafting public/private partnerships should seek payment for the effort from grants, and not from the volume of a program over which they have no control.

Program Links: <http://www.lead-safeillinois.org/prevention/>

City/State: Lansing, Michigan

Issue: Replacing lead service lines in the city to prevent drinking water contamination.

Background: The Lansing Board of Water & Light (LBWL) is a municipally owned utility governed by a Board of Commissioners. It has groundwater supplies and treats 22 MGD on average per day from 125 wells. There are approximately 59,000 accounts. LBWL took ownership of all water service lines from the main line to the meter inside the building in 1927, and had installed lead service lines up until the early 1960s. Due to their ownership, they have very good records of the type of material for all the service lines. Although there were lead service lines in the system, all the lead sampling showed lead levels below the 90th percentile standard. LBWL has been using a corrosion inhibitor in the system since 1997 to help keep the lead levels low. In 2004, the LBWL board approved a Lead Service Line Replacement (LSLR) Program. Approximately 14,000 service lines were replaced between 2004 and 2017. This represents all the known lead service lines in the system.

Financing/Funding Approach: The total cost to replace the 14,000 lead service lines was \$44.5 million. Given the LBWL's ownership of the complete service line, the replacements were handled as a capital investment of the utility. Over the 14 years of replacement, the average annual investment has been approximately \$3.4 Million/year. Rate payer revenues were used as part of the funding for the project. To reduce the costs, the city developed its own unique method of trenchless service line replacement. Initially, the replacements cost approximately \$9,000 per home. With its trenchless method, the costs were reduced to \$3,600 per home. The time was reduced from all day to four hours. When possible, projects were coordinated with other infrastructure replacements, such as road resurfacing or combined sewer overflow projects, to save on pavement removal costs. The initial goal of removing all lead services in ten years had to be extended to 14 years because of the slowdown in the combined sewer overflow work that occurred because of the recession.

Effectiveness: The program was extremely effective. With Madison, Lansing represents only the second city to remove all of its lead service lines. The work was done in a cost-efficient manner and was coordinated with homeowners and largely supported by the community. Only complete service line replacements were done. Testing has shown the city's water system to be in compliance with all lead and copper standards.

Applicability to Other Utilities: The unique ownership style of the service lines made this project much easier to complete. There was no issue with accessing property or getting homeowners to agree to remove the lines because LBWL's regulations allow for its employees to enter the customer's property to maintain the service line. There was coordination with the customers, but it was not necessary to work with a private plumber to do the customer's side of the service as is often the case when the utility

only owns to the curb stop. There also was no concern with partial lead line replacement since the utility owned the entire line. LBWL has trained many other utilities in how to do the trenchless service line replacement method.

Case Study Takeaway: Lansing reveals that a long-term, steady approach can work to remove lead service lines. It was a major investment, but the utility accomplished the task by phasing the project over 14 years. Looking at the lead service line replacement as an investment in the utility was a positive approach. The city was able to use its own ingenuity to improve the speed and cost of repairs.

Program Links:

<https://www.lbwl.com/Search.aspx?searchtext=lead%20water%20line%20replacement&LangType=1033>

<https://www.lbwl.com/Community.../Lead-Service-Line-Replacement-Presentation/>

<http://www.detroitnews.com/story/news/local/michigan/2016/12/14/lansing-lead-service-line/95435604/>

City/State: Wisconsin

Issue: Helping disadvantaged customers pay for lead service line replacements when entire lead service lines are being replaced.

Background: It has been shown that it is necessary to replace full lead service lines, not partial service lines, in order to protect customers. In most water systems, the system owns the line from the main line pipe to the curb stop and the customer owns the line from the curb stop to the house or building. While the system can fund the replacement of their portion of the service line through user fees, they cannot use user fees to replace the private portion of the service line. If customers are unable to pay for their portion of the replacement, either only a partial replacement could be done or the entire line would have to remain in place. Either of these scenarios is problematic, so Wisconsin DNR has allocated funds to help disadvantaged communities with the full lead service line replacement.

Financing/ Funding Approach: The funding for this program will come from Wisconsin's State Revolving Fund Program. As such, it is federal funding and will require the recipient to abide by all federal requirements. It is entirely principal forgiveness and does not include any loan portion. A municipality can do a lead pipe replacement (LPR) project on its own (meaning no other work is being done) or it can be part of a bigger pipe replacement project. The applicant also has the choice to use the funding to seed a local revolving fund for lead pipe replacement or to set up a rebate program for homeowners. The program is only eligible for two years – FY 17 and FY 18 – and the first year of the project, \$11.8 million was set aside for the principal forgiveness.

A municipality is eligible for the funding if it qualifies for at least 15% principal forgiveness under the regular guidelines for principal forgiveness. As long as the municipality qualifies at this level or higher they are eligible for the maximum amount of award as shown below.

- \$1,000,000 for municipalities with populations over 500,000
- \$500,000 for municipalities with populations between 50,000 and 500,000
- \$300,000 for municipalities with populations below 50,000

Effectiveness: Thirty-eight municipalities submitted applications for the first round of funding. They have three years to use this funding. It is too soon to know exactly how effective the program will

ultimately be, but it will allow municipalities to pay for the entire replacement cost of lead service lines at no cost to the municipality, so it is expected to be very effective.

Concerns or Barriers: There is no ability to use this funding for low income areas within communities that are otherwise not considered disadvantaged. These customers are at a disadvantage because they will not be eligible for no-cost replacement but will have a hard time paying for the replacement cost any other way.

Case Study Takeaway: For states in which there are large numbers of communities with lead service lines and large numbers of disadvantaged communities, this approach may be an option to increase the pace and affordability of lead service line replacement.

Program Links:

<http://dnr.wi.gov/Aid/projectListsIUPs.html>

<http://dnr.wi.gov/Aid/documents/EIF/leadServiceLineFunding.html>

Appendix D: Lead Abatement Industry Employment Data

The intent of this section is to provide insight into the number of employers who work and retain numerous employees across the country in the field of “lead abatement, lead risk assessment, lead inspection, lead project monitoring, lead project supervising, lead handling workers, and all lead practitioners.”

The information contained here was compiled from various state, and federal websites from all 50 U.S. states, and includes Washington D.C. Within the information captured for each state a list of website links are provided to showcase where the information was derived from. The 13,914 lead firms associated with the data in the addendum are corporate entities large and medium sized as well as the small business. Additionally, the information also reflects companies that provide “EPA certified lead abatement training and lead certifying” to assist with a more well-rounded view of the jobs associated with lead abatement.

Lastly, this section does include very limited information on the amount of staff contained within each of the 13,914 lead abatement firms. Unfortunately, information from each employer was not readily accessible allowing for the quantification of employees associated within each field of “lead abatement” services needed to perform in removal of toxic hazardous contaminated materials that currently plague various U.S. communities, and the environment.

The total number tally contained in this section is for the number of companies/firms only. A loss of 13,913 firms and companies would take place if lead abatement programs are discontinued nationwide. This information does not list the number of employees within each firm although within this document some information on individuals was located and provided were data was readily available. All firms and companies compiled in the total count shown above are shown in *bold* lettering throughout the document and used for the final tally.

Alabama

- Contractors within the state certified for lead abatement services/ removal- **267 firms** (12 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services/ train the trainer/ certifications- **11 companies**
- Links
<http://www.alabamapublichealth.gov/lead/index.html>
<http://www.alabamapublichealth.gov/lead/assets/rrpweblist03012017.pdf>
<http://www.leadsafelist.com/renovators/alabama/>

Alaska

In Alaska, the US EPA administers the lead-based abatement program. The construction industry is affected by two separate regulations that impact activities associated with lead paint.

- Contractors within the state providing lead abatement services- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **506 firms and or organizations** (combined list of contractors, and organizations)

- Links
<http://www.envcap.org/statetools/lead/pb2001.cfm?st=AK>
<https://www.environmental-expert.com/companies/keyword-lead-abatement-1017/serving-usa-alaska?redirectedToServing=1>
<http://www.leadsafelist.com/renovators/alaska/>

Arizona

- Contractors within the state providing lead abatement services- **27 firms** (7 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications - EPA provides certification training for lead abatement trainers. No list could be located to provide any company names
- Links
<http://legacy.azdeq.gov/environ/waste/ust/statelead.html>
<http://www.azdeq.gov/>
<http://www.azroc.gov/roc/contractorsearch.html>
<http://www.leadsafelist.com/renovators/arizona/>

Arkansas

- Contractors within the state providing lead abatement services- **10 firms** (9 counties)
- *Arkansas Department of Health website as well as the state's official website have removed all information regarding lead abatement contractors, services, programs, and or training classes. All links associated with this topic that correlate to the state's official websites have the Error Message 404. No additional information could be located without directly calling upon each entity one at a time to obtain information needed.*
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – *No information located*
- Links
<http://www.healthy.arkansas.gov/programsServices/epidemiology/Environmental/Pages/LeadBasedPaint.aspx>
<http://www.leadsafelist.com/renovators/arkansas/>

California

- Contractors within the state providing lead abatement services- **347 firms** (from 46 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **40 companies** approximated due to repeat of supplier information
- Links
 Type of Certificate Required Training Inspector/Assessor Inspection/Assessment (40 hours); or Certified Industrial Hygienist Course (24 hours - CIHs only) Project Monitor Supervision & Project Monitoring (40 hours); or Work (24 hours) + Supplemental Supervision & Project Monitoring (16 hours); or Certified Industrial Hygienist Course (24 hours - CIHs only) Sampling Technician Sampling Technician (8 hours) Supervisor Supervision & Project Monitoring (40 hours); or Work (24 hours) + Supplemental Supervision & Project Monitoring (16 hours) Worker Work (24 hours) *(the above information is a link)*

<http://www.leadsafelist.com/renovators/California/>
<https://archive.cdph.ca.gov/programs/CLPPB/Pages/LRCWhichCert.aspx>

Type of Certificate	Required Training
Inspector/Assessor	Inspection/Assessment (40 hours); or Certified Industrial Hygienist Course (24 hours - CIHs only)
Project Monitor	Supervision & Project Monitoring (40 hours); or Work (24 hours) + Supplemental Supervision & Project Monitoring (16 hours); or Certified Industrial Hygienist Course (24 hours - CIHs only)
Sampling Technician	Sampling Technician (8 hours)
Supervisor	Supervision & Project Monitoring (40 hours); or Work (24 hours) + Supplemental Supervision & Project Monitoring (16 hours)
Worker	Work (24 hours)

Colorado

- Contractors within the state providing lead abatement services- **93 firms** (23 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications, evaluator, laboratories- **37 companies**
- County Staff focused on Lead Abatement- 64 individuals
- Additional entities providing regulatory services- **9**
- Links
<http://www.lead safelist.com/renovators/Colorado/>
https://www.colorado.gov/pacific/sites/default/files/AP_IN_Lead-Services-Directory.pdf

Connecticut

- Contractors within the state providing lead abatement services- **98 firms** (8 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **7 companies**
- **3** state official office staff members, LEAD POISONING PREVENTION, Program Contacts
- Links
<http://www.lead safelist.com/renovators/Connecticut/>
http://www.ct.gov/dph/lib/dph/environmental_health/lead/pdf/resources.pdf
http://www.ct.gov/dph/lib/dph/environmental_health/lead/pdf/how_to_find_dph_licensed_contractor-4-12-12.pdf
<https://www.elicense.ct.gov/> (site cannot be accessed without user name and ID)

Contractors and Consultants

- Licensed Lead Practitioners

Education and Training

- Lead Training Providers
- Training Course Approval

- EPA's Renovation, Repair and Painting (RRP) Certification Program
- Lead Inspections
- Lead Abatement Guidance Documents
- Licensing and Certification Requirements
- Lead Semi-Annual Meeting information

Delaware

- Contractors within the state providing lead abatement services- **42 firms**
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **260 companies** (Delaware certified Renovation Firms), **18 companies** (Lead Certified Risk Assessment Firms)
- Links
<http://dhss.delaware.gov/dph/hsp/leadregcomm.html>
<http://dhss.delaware.gov/dph/hsp/files/leadcert.pdf>
<http://dhss.delaware.gov/dph/hsp/files/leadcertrrp.pdf>

Florida

- Contractors within the state providing lead abatement services- **171 firms** (46 counties)
Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications, Dust Sampling Technician, Lead Abatement Supervisor, Lead Abatement Worker, Lead Inspector, Lead Renovator (Renovation, Repair, and Painting), Lead Risk Assessor, Project Designer- all jobs associated with list
- Links
<http://www.leadsafelist.com/renovators/florida/>
<http://www.floridahealth.gov/environmental-health/lead-poisoning/renovation.html>
<http://www.leadcertification.org/states.php?s=fl>

Georgia

- Contractors within the state providing lead abatement services (Georgia Certified Lead-Based Paint Renovation Firms (as of August 8, 2017,) – **873 firms**
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **125 companies**, Lead Paint Inspectors 152 individuals
- Links
<https://epd.georgia.gov/lead-based-paint>
[https://epd.georgia.gov/sites/epd.georgia.gov/files/Lead Abatement Training Providers 0112 15 pdf](https://epd.georgia.gov/sites/epd.georgia.gov/files/Lead%20Abatement%20Training%20Providers%20011215.pdf)
https://epd.georgia.gov/sites/epd.georgia.gov/files/Lead_Firms_Aug2017.pdf
https://epd.georgia.gov/sites/epd.georgia.gov/files/GeorgiaCertifiedRenovators_080817.pdf
https://epd.georgia.gov/sites/epd.georgia.gov/files/Lead_Individuals_Aug2017.pdf

Hawaii

- Contractors within the state providing lead abatement services- **87 firms**
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **5 companies**
- Links
<http://www.leadsafelist.com/renovators/hawaii/>

<http://health.hawaii.gov/irhb/lead/>
<http://health.hawaii.gov/irhb/files/2013/07/leadtp.pdf>
<http://health.hawaii.gov/irhb/files/2013/07/Hawaii-Certified-Firms-January-1-2017.pdf>

Idaho

- Contractors within the state providing lead abatement services- **25 firms + 11 EPA certified lead abatement firms** (17 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – lead abatement trainings appear to be only provided through the EPA in the State of Idaho
- Links
<http://www.leadsafelist.com/renovators/idaho/>
https://cfpub.epa.gov/flpp/pub/index.cfm?do=main.firmResults&Applicant_Type=FIRM&static=true&doSearch=Yes&qlat=&qlong=&programType=Abatement%2CCombination&discipline=Evaluation&TxtLocation=&distance_1=50&state_2=ID&Applicant_Name=&Certificate_number=
<https://labor.idaho.gov/dnn/wia/CustomServices/EligibleProviderLists.aspx>

Illinois

- Contractors within the state providing lead abatement services- **121 firms** (39 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications, supervisors, employees, lead risk assessor, lead risk inspector – 325 individuals
- Links
<http://www.leadsafelist.com/renovators/illinois/>
https://data.illinois.gov/dataset/566lead_contractor_registration
https://data.illinois.gov/dataset/566lead_contractor_registration/resource/a225b294-22bf-4ff6-8854-27d5edb4d705
https://data.illinois.gov/dataset/568lead_supervisor_licensees
https://data.illinois.gov/dataset/568lead_supervisor_licensees/resource/70d68a68-50fe-48e9-86ea-b609934fab17
https://data.illinois.gov/dataset/570lead_worker_licensees
https://data.illinois.gov/dataset/570lead_worker_licensees/resource/6934e526-c43a-415b-a999-6b2ae29f0b2a
https://data.illinois.gov/dataset/567lead_risk_assessor_and_inspector_licensees
https://data.illinois.gov/dataset/567lead_risk_assessor_and_inspector_licensees/resource/e566c181-c345-4e49-9ff5-d233ec210adc
https://data.illinois.gov/dataset/569lead_training_course_provider_list
https://data.illinois.gov/dataset/569lead_training_course_provider_list/resource/4d45e54b-fcc9-45a1-a605-e5c7520fcda4

Indiana

- Contractors within the state providing lead abatement services- **80 Firms** (39 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **13 Companies**
- Links

<http://www.leadsafelist.com/renovators/Indiana/>
http://www.ai.org/isdh/files/1_LIST_OF_LEAD_TRAINING_COURSE_PROVIDERS.pdf

Iowa

- Contractors within the state providing lead abatement services- **5 Firms**
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **10, Lead Testing Companies**
- Links
<http://idph.iowa.gov/lpp>
https://idph.iowa.gov/Portals/1/userfiles/81/AugustLTP_ByNameofFirm%26Courses.pdf
https://idph.iowa.gov/Portals/1/userfiles/81/April2017_ThirdPartyTestProviders%20%281%29.pdf
<http://www.leadsafelist.com/renovators/iowa/>

Kansas

- Contractors within the state providing lead abatement services/ Lead Activity- **51 firms**
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **7 companies, Certified Renovators excel worksheet**
340 individuals
- Links
<http://www.kshealthyhomes.org/>
http://www.kshealthyhomes.org/lead_training.htm
<http://www.kshealthyhomes.org/download/LicensedLeadActivityFirmsfinal-28-2017.pdf>

Kentucky

- Contractors within the state providing lead abatement services- **53 Firms**
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **6 Companies**
- Links
<http://chfs.ky.gov/dph/lead.htm>
<http://chfs.ky.gov/NR/ronlyres/1509229C-F492-45D9-865C-B54CFF24B8A4/0/WebListingDecember2016.pdf>
<http://chfs.ky.gov/NR/ronlyres/54B11067-5949-492D-AAEE-8042DBFC764B/0/TrainingProviderWebpageDecember2016.pdf>
<http://www.leadsafelist.com/renovators/kentucky/>

Louisiana

- Contractors within the state providing lead abatement services- **23 Firms** (14 Parishes)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **6 Companies**
- Links
<http://www.leadsafelist.com/renovators/louisiana/>
<http://deq.louisiana.gov/page/leadbased-paint/>
http://deq.louisiana.gov/assets/docs/Air/Lead_Paint/LA-RRP-program-Trainers-EPA-as-of-090911.pdf

Maine

- Contractors within the state providing lead abatement services- **31 Firms** (12 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **20 Companies**, 17 Inspectors, 10 Accessors
- Links
 - <http://www.leadsafelist.com/renovators/maine/>
 - <http://www.maine.gov/dep/waste/asbestos/trproviders.html>
 - <http://www.maine.gov/dep/waste/lead/findalp.html>
 - <http://www.maine.gov/dep/waste/lead/leadcontractors.html>
 - <http://www.maine.gov/dep/waste/lead/leadinspectors.html>
 - <http://www.maine.gov/dep/waste/lead/leadassessors.html>

Maryland

- Contractors within the state providing lead abatement services- **146 Firms** (24 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **8 Companies**, 255 Inspectors
- Links
 - <http://www.leadsafelist.com/renovators/maryland/>
 - <http://mde.maryland.gov/programs/LAND/Documents/LeadFactSheets/LeadfsTrainingProviderList.pdf>
 - http://mde.maryland.gov/programs/LAND/LeadPoisoningPrevention/Pages/leadcontractors.aspx?state_wide=1
 - http://mde.maryland.gov/programs/LAND/LeadPoisoningPrevention/Pages/leadinspectors.aspx?a=go&state_wide=1

Massachusetts

- Contractors within the state providing lead abatement services Currently Licensed Renovation, Repair and Painting Contractors – **896 Firms** (14 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **12 Companies**
- Links
 - <http://www.mass.gov/lwd/labor-standards/deleading-and-lead-safety/>
 - <http://www.mass.gov/lwd/docs/dos/lead-asbestos/lead/la-rpt-list-lr.pdf>
 - <http://www.mass.gov/lwd/docs/dos/lead-asbestos/lead/la-rpt-list-dc.pdf>
 - <http://www.leadsafelist.com/renovators/Massachusetts/>
 - <http://www.mass.gov/lwd/docs/dos/lead-asbestos/lead/la-rpt-list-dt.pdf>

Michigan

- Contractors within the state providing lead abatement services- **214 Firms** (34 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **6 companies**, 92 certified lead workers, 716 supervisors

- Links
http://www.michigan.gov/mdhhs/0,5885,7-339-71550_2955_2983-42276--,00.html
http://www.michigan.gov/mdhhs/0,5885,7-339-71550_2955_2983-95171--,00.html
http://www.michigan.gov/documents/mdhhs/List_of_Contractors_543750_7.pdf
http://www.michigan.gov/documents/mdhhs/Worker_543746_7.pdf
http://www.michigan.gov/documents/mdhhs/Supervisors_543748_7.pdf
<http://www.leadsafelist.com/renovators/michigan/>

Minnesota

- Contractors within the state providing lead abatement services- **230 Firms** contractors and consultants (36 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – EPA provides training for instructors teaching lead abatement courses in Minnesota, a list cannot be obtained of the providers unless taking a course
- Links
<http://www.leadsafelist.com/renovators/minnesota/>
<http://www.health.state.mn.us/divs/eh/lead/prof/license.html>
http://www.health.state.mn.us/divs/eh/lead/find_firm/index.cfm
http://www.health.state.mn.us/divs/eh/lead/find_firm/pb_firms_by_state.cfr?state_code=MN
<http://www.leadcertificationmn.com/>

Mississippi

- Contractors within the state providing lead abatement services, Mississippi Lead Based Paint Certified entities- **148 firms**
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications, inspectors - 30 lead inspectors, 19 risk assessors
- Links
http://www.deq.state.ms.us/MDEQ.nsf/page/Air_Lead-BasedPaint
http://opc.deq.state.ms.us/report_lead_el.aspx
http://www.deq.state.ms.us/MDEQ.nsf/page/Air_Lead-BasedPaint
[http://www.deq.state.ms.us/MDEQ.nsf/pdf/Air_LBPMSAccreditedTrainingProviders12_02_2015/\\$File/Mississippi%20Accredited%20Training%20Providers%20offering%20Lead%20Renovator%20Training.pdf?OpenElement](http://www.deq.state.ms.us/MDEQ.nsf/pdf/Air_LBPMSAccreditedTrainingProviders12_02_2015/$File/Mississippi%20Accredited%20Training%20Providers%20offering%20Lead%20Renovator%20Training.pdf?OpenElement)
http://opc.deq.state.ms.us/report_lead_el.aspx
<http://www.leadsafelist.com/renovators/mississippi/>

Missouri

- Contractors within the state providing lead abatement services- **180 firms** (29 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – 302 abatement supervisors, 628 lead abatement workers, 66 inspectors, 115 risk assessors, 9 project designers, **11 companies** that train and certify lead abatement firms/ companies/entities and individuals
- Links
<http://health.mo.gov/safety/leadlicensing/>
<http://health.mo.gov/safety/leadlicensing/pdf/AbatementContractors.pdf>

<http://health.mo.gov/safety/leadlicensing/pdf/MissouriLicensedLeadAbatementWorkers.pdf>
<http://health.mo.gov/safety/leadlicensing/pdf/MissouriLicensedLeadInspectors.pdf>
<http://health.mo.gov/safety/leadlicensing/pdf/MissouriLicensedRiskAssessors.pdf>
<http://health.mo.gov/safety/leadlicensing/pdf/MissouriLicensedLeadProjectDesigners.pdf>
<http://www.leadsafelist.com/renovators/missouri/>
<http://health.mo.gov/safety/leadlicensing/training.php>
<http://health.mo.gov/safety/leadlicensing/pdf/AccreditedProvidersReport.pdf>

Montana

- Contractors within the state providing lead abatement services- **7 firms** (10 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – EPA provides certification training for lead abatement trainers. No list could be located to provide any company names
- Links
<http://www.leadsafelist.com/renovators/montana/>
<http://deq.mt.gov/Business/leadbasedpaint>

Nebraska

- Contractors within the state providing lead abatement services- **11 firms** (9 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications, consultants – **8 companies**
- Links
<http://www.leadsafelist.com/renovators/nebraska/>
<http://dhhs.ne.gov/publichealth/Pages/LeadContractors.aspx>
<http://dhhs.ne.gov/publichealth/Documents/LeadBusinessEntitiesAndConsultants.pdf>
<http://dhhs.ne.gov/publichealth/Documents/leadthirdpartyexams.pdf>

Nevada

- Contractors within the state providing lead abatement services- **18 firms** (5 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – EPA provides trainer training a compiled list of trainers could not be located
- Links
<http://www.leadsafelist.com/renovators/nevada/>
<https://www.epa.gov/lead/lead-based-paint-activities-professionals>

New Hampshire

- Contractors within the state providing lead abatement services- **47 firms** (10 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – EPA provides trainer training for lead abatement programs
- Links
<https://www.dhhs.nh.gov/dphs/bchs/clpp/documents/contractor.pdf>
<http://www.leadsafelist.com/renovators/new-hampshire/>

New Jersey

- Contractors within the state providing lead abatement services- **154 firms** (21 counties)

- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **13 companies**
- Links
<http://www.state.nj.us/health/ceohs/lead/lead-training-cert/>
http://www.state.nj.us/health/ceohs/documents/lead/pb_trng_providers.pdf
<http://www.leadsafelist.com/renovators/New-Jersey/>

New Mexico

- Contractors within the state providing lead abatement services- **16 firms** (7 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications - EPA provides trainer training for lead abatement programs
- Links
<http://www.leadsafelist.com/renovators/new-mexico/>

New York

- Contractors within the state providing lead abatement services- **336 firms** (55 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – the State of New York provides a mix of training providers and sources including some training through the EPA. Unfortunately, due to the lack of a unified database a list of certified trainers could not be located
- Links
<http://www.leadsafelist.com/renovators/new-york/>
<http://www.nyshcr.org/AboutUs/Training/index.htm#lead>

North Carolina

- Contractors within the state providing lead abatement services- **13 firms** (additional database provided but no ability to search statewide, only a city by city search available/ not user friendly)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **27 companies**
- Links
<http://epi.publichealth.nc.gov/lead/lhmp.html>
<http://epi.publichealth.nc.gov/lead/pdf/LeadTrainingProviders0817.pdf>
http://epi.publichealth.nc.gov/lead/pdf/NCRRPTrngPvdrInfo_Aug2017.pdf
<http://www.schs.state.nc.us/lead/accredited.cfm>
<http://www.leadsafelist.com/renovators/North-Carolina/>

North Dakota

- Contractors within the state providing lead abatement services- **32 firms**
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – EPA provides training for the certified lead abatement contractors
- Links
<http://www.leadsafelist.com/renovators/north-dakota/>
<https://www.ndhealth.gov/aq/iaq/lbp/>
<http://www.ndhealth.gov/AQ/IAQ/LBP/NDLIBLBP.pdf>
<http://www.ndhealth.gov/ehs/aq/Lead/>

Ohio

- Contractors within the state providing lead abatement services- **108 firms** (51 counties). The state database requires an individual name search by city and county to locate a certified licensed lead abatement contractor
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications - Any trainer wishing to offer the U.S. EPA's Renovation, Repair, and Painting (RRP) Renovator training in Ohio needs to not only be approved by the USEPA, but also by ODH (Ohio Department of Health). A list of training companies was not located
- Links
 - <http://www.leadsafelist.com/renovators/ohio/>
 - <https://www.odh.ohio.gov/-/media/ODH/ASSETS/Files/eh/lead-poisoning-prevention/ODH-Approved-Encapsulant-List-7-1-15.pdf?la=en>
 - https://www.odh.ohio.gov/odhprograms/eh/lp_prev/lp_list1.aspx
 - http://publicapps.odh.ohio.gov/Envlicense_Reports/External_License_Search.aspx?Program=Lead

Oklahoma

- Contractors within the state providing lead abatement services- **256**
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications -
- Links
 - <http://www.deq.state.ok.us/aqdnew/lbp/index.htm>
 - <http://www.deq.state.ok.us/aqdnew/lbp/lbplistings.htm>
 - <http://www.deq.state.ok.us/aqdnew/lbp/Certified%20Lists/CertifiedLBPAbatementWorkers.html>
 - <http://www.deq.state.ok.us/aqdnew/lbp/Certified%20Lists/CertifiedLBPFirms.html>
 - <http://www.deq.state.ok.us/aqdnew/lbp/Certified%20Lists/CertifiedLBPIinspectors.html>
 - <http://www.deq.state.ok.us/aqdnew/lbp/Certified%20Lists/CertifiedLBPRiskAssessors.html>
 - <http://www.deq.state.ok.us/aqdnew/lbp/Certified%20Lists/CertifiedLBPProjectDesigners.html>
 - <http://www.deq.state.ok.us/aqdnew/lbp/Certified%20Lists/CertifiedLBPSupervisors.html>
 - http://www.deq.state.ok.us/aqdnew/lbp/Certified%20Lists/RRP_Firms.html
- Abatement Workers
- Firms
- Inspectors
- Inspector/Risk Assessors
- Project Designers
- Supervisors
- Renovation, Repair and Painting Firms

Oregon

- Contractors within the state providing lead abatement services- **41 firms** (5 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **14 companies**
- Links
 - <http://www.oregon.gov/OHA/PH/Pages/index.aspx>

<http://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/HEALTHYNEIGHBORHOODS/LEADPOISONING/TRAININGPROVIDERS/Documents/OR-Accredited-RRP-LBPA-Training-Providers.pdf>
<http://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/HEALTHYNEIGHBORHOODS/LEADPOISONING/INSPECTIONABATEMENTPROFESSIONALS/Documents/firmlist.pdf>
<http://www.leadsafelist.com/renovators/Oregon/>

Pennsylvania

- Contractors within the state providing lead abatement services- **106 firms** (48 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **12 companies**
- Links
<http://www.leadsafelist.com/renovators/pennsylvania/>
www.dli.pa.gov/Individuals/Labor-Management-Relations/bois/.../LEDCONTR.HTML
<http://www.phila.gov/health/pdfs/CertifiedLeadAbatementContractors.pdf>
www.dli.pa.gov/Individuals/Labor-Management-Relations/bois/.../LEDSCH.HTML

Rhode Island

- Contractors within the state providing lead abatement services- **2031 firms/ licensed individuals**
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – categories *combined within contractor grouping shown above information provided from state website*
- Links
<http://www.health.ri.gov/healthrisks/poisoning/lead/index.php>
<http://www.health.ri.gov/find/environmentallead/trainingcourses/>
<http://www.leadsafelist.com/renovators/rhode-island/>
<http://www.health.ri.gov/find/licensees/index.php?prof=Lead%20Program#foo>

South Carolina

- Contractors within the state providing lead abatement services- **23 firms** (18 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – the EPA administers the states lead abatement training programs, individual training company information not available
- Links
<https://www.epa.gov/lead/lead-based-paint-activities-professionals>
<http://www.leadsafelist.com/renovators/south-carolina/>

South Dakota

- Contractors within the state providing lead abatement services- **6 firms** (4 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – the EPA provides the lead safe training and certification in the State of South Dakota
- Links
<http://www.leadsafelist.com/renovators/South-dakota/>
<https://denr.sd.gov/des/wm/wmp/leadpaint2.aspx>

Tennessee

- Contractors within the state providing lead abatement services- **38 firms** (32 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications - the EPA provides the lead safe training and certification in the State of Tennessee
- Links
<http://www.leadsafelist.com/renovators/tennessee/>

Texas

- Contractors within the state providing lead abatement services- **78 firms** (38 counties) The State of Texas requires a database search online by city and county to locate a licensed and lead abatement certified contractor
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **12 companies**
- Links
<https://www.dshs.texas.gov/elp/training-providers.aspx>

Utah

- Contractors within the state providing lead abatement services- **208 firms**
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **10 companies**
- Links
<https://deq.utah.gov/ProgramsServices/programs/air/lead/index.htm>
<https://documents.deq.utah.gov/air-quality/compliance/atlas/DAQ-2017-002431.pdf>
<https://documents.deq.utah.gov/air-quality/compliance/atlas/DAQ-2017-002403.pdf>
<http://www.leadsafelist.com/renovators/utah/>

Vermont

- Contractors within the state providing lead abatement services- **5 firms** (7 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – EPA Renovator Training Courses are provided by various organization certified by the EPA. A compiled list of the trainer providers was not located
- Links
<http://www.leadsafelist.com/renovators/vermont/>
<http://www.healthvermont.gov/health-environment/asbestos-lead-buildings/lead>

Virginia

- Contractors within the state providing lead abatement services- **96 firms** (49 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – the EPA provides lead certification training for the State of Virginia outside organizations providing any additional EPA certified training was not located
- Links
<http://www.leadsafelist.com/renovators/virginia/>
<http://www.leadcertificationva.com/>

Washington

- Contractors within the state providing lead abatement services- **2370 firms** (19 counties) (52-page documented list of certified lead abatement firms)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – **18 companies**
- Links
<http://www.commerce.wa.gov/building-infrastructure/housing/lead-based-paint/renovation-repair-painting/>
<http://www.commerce.wa.gov/wp-content/uploads/2015/12/ceo-rrp-training-providers.pdf>
<https://app.box.com/s/ry966km9dvrwwjm17hwom3g43flkjtij>

West Virginia

- Contractors within the state providing lead abatement services- **11 firms** (14 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – A compiled list of certified lead abatement training companies was not located
- Links
<http://www.leadsafelist.com/renovators/west-virginia/>

Wisconsin

- Contractors within the state providing lead abatement services- **2080 firms**
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications/ consultants – **259 companies**
- Links
<https://www.dhs.wisconsin.gov/lead/index.htm>
<https://www.dhs.wisconsin.gov/lead/training.htm>
<https://www.dhs.wisconsin.gov/lead/contractor/leadsafecompany.pdf>
<https://www.dhs.wisconsin.gov/lead/contractor/leadcompany.pdf>

Wyoming

- Contractors within the state providing lead abatement services- **5 firms** (4 counties)
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – online applications must be submitted to the EPA for certified lead abatement training courses, information on additional trainings outside the EPA was not located and could not be provided
- Links
<http://www.leadsafelist.com/renovators/wyoming/>

Washington D.C.

- Contractors within the state providing lead abatement services- **99 firms**
- Organizations that provide lead removal support programs/ advocate/ awareness/ referral services / train the trainer/ certifications – information was not located on the training providers for certified lead abatement training in Washington D.C.
- Links
<http://www.leadsafelist.com/renovators/D-C/>
<https://doee.dc.gov/publication/certified-lead-based-paint-abatement-renovation-companies>

<https://doee.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/DC%20Lead%20Abatement%20-%20Renovation%20Companies%20Updated%208-21-2017.pdf>
<https://doee.dc.gov/lead>

Publication #850R17002