1192 WESTMINSTER STREET • PROVIDENCE, RI 02909 • 401-785-1310
www.LEADSAFEKIDS.org

January 5, 2022

Michael S. Regan, Administrator
U.S. Environmental Protection Agency
Mail Code 1101A
1200 Pennsylvania Avenue, NW
Washington, DC 20460
Regan.Michael@epa.gov

Lilian Dorka, Director
External Civil Rights Compliance Office
U.S. Environmental Protection Agency
Mail Code 2310A
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460
Dorka.Lilian@epa.gov

External Civil Rights Compliance Office
U.S. Environmental Protection Agency
Mail Code 2310A
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460
Title_VI_Complaints@epa.gov

Re: Complaint Under Title VI of the Civil Rights Act of 1964, 41 U.S.C. § 2000d, 40 C.F.R. Part 7 against Providence Water

Dear Administrator Regan and Director Dorka:

The Childhood Lead Action Project ("CLAP"), South Providence Neighborhood Association ("SPNA"), Direct Action for Rights and Equality ("DARE"), National Center for Healthy Housing ("NCHH"), and Environmental Defense Fund ("EDF") submit this complaint against the Providence Water Supply Board ("Providence Water") for violating Title VI of the Civil Rights Act of 1964 ("Title VI") and the Environmental Protection Agency's ("EPA") implementing regulations. Providence Water's process for replacing lead service lines ("LSLs") that provide drinking water to homes disproportionately increases the risk of lead exposure to Black, Latinx, and Native American residents, resulting in discriminatory effects based on race, color, or national origin. We request that you investigate Providence Water's practices and require the utility take action to eliminate discriminatory effects.

Lead in drinking water is a pervasive, national problem. A primary source of contamination comes from LSLs that connect many water mains in the street to plumbing in individual homes. Approximately 6–10 million homes in the United States are served by LSLs from which lead leaches into the homes' drinking water.[1] Providence Water's service area contains an estimated 27,500 LSLs.[2]

EPA found that being a person of color and being low-income are risk factors for lead exposure and elevated blood lead levels ("BLL").[3] This is of particular concern in Providence, North Providence, Cranston, and Johnston, because they are the cities and towns directly serviced by Providence Water. A United States Government Accountability Office ("GAO") report that examined Providence Water's LSL data reported that people of color, renters, and families in poverty are more likely to live in homes with LSLs.[4] Thus, these communities are disproportionately exposed to lead from LSLs in Providence.

Providence Water exceeded EPA's lead action level under the Lead and Copper Rule (the regulations implementing the Safe Drinking Water Act for lead in drinking water) every year since 2006, with the exception of 2015.[5] As a result, the utility was recently ranked second-worst on a national priority watch list for lead.[6] Additionally, homes serviced by LSLs in Providence Water's service area routinely have water samples with lead levels above 100 parts per billion (ppb), nearly six times above EPA's lead action level.[7]

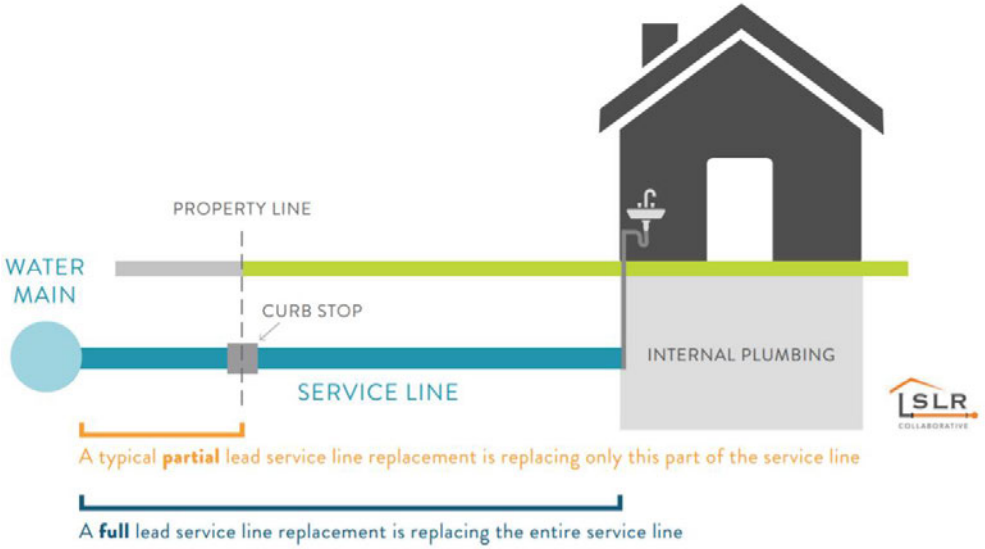
As EPA has consistently made clear, there is no safe level of exposure to lead.[8] It is harmful to all people, but especially children, whose nervous systems are still developing, and to pregnant people, because lead can cross the placental barrier and harm the fetus.

Full replacement of LSLs is the only way to eliminate this source of lead exposure from drinking water.

Providence Water's process to replace LSLs generally happens as part of its water main infrastructure rehabilitation projects during which the utility replaces only the portion of the LSL that runs from the water main to the curb stop (a public-side or partial LSL replacement) (see *Figure 1*).[9] These partial replacements disturb the remaining private-side LSL that runs from the curb stop to the house meter, which can increase the release of lead particulates into residents' drinking water resulting in higher lead levels in the short-term with no long-term reduction in lead.[10]

To replace the entire LSL, Providence Water requires homeowners and landlords to pay for replacing the private-side LSL, at a cost of up to $4,500 through a 10-year, 0% interest loan program. When these customers lack the resources to pay or borrow money to pay for the private-side LSL replacement, Providence Water proceeds with a partial LSL replacement, putting residents at a higher risk of lead exposure from drinking water.

Figure 1: A graphic description that shows the distinction between a public-side LSL (here labeled only as a partial LSL) and a full LSL. The private-side LSL is represented in the graphic by the section of the service line from the right side of the curb stop to the internal plumbing area of the household. A full LSL replacement is categorized as such when the private-side and public-side LSL are replaced at one time.



Source: Lead Service Line Replacement Collaborative.

A study by American University, Environmental Defense Fund, and Washington, D.C. Water ("DC Water") illustrates the discriminatory effect of LSL replacement practices like the one utilized by Providence Water. The study showed that low-income residents are less likely than their wealthier counterparts to opt to replace the private-side LSL, presumably because they don't have the financial means to pay for the replacement.[11] In cities such as Washington, DC with a long history of underinvestment and redlining in predominately Black neighborhoods, there is a close correlation between income and race, resulting in Black residents being less likely to opt to replace the private-side LSL.

In Providence County, which includes all of Providence Water's service area, low-income residents are more likely to be Black, Latinx,[12] and Native American. In practice, the result of Providence Water's infrastructure work is that people with an ability to pay for a full replacement—who are disproportionately white—are able to reduce their overall lead exposure risk, while those with less ability to pay—who are disproportionately Black, Latinx, and Native American—gain no such benefit and face increased lead exposure risks in the short-term with no assurance of long-term reduction in risk.

We maintain that Providence Water's practice of conducting partial LSL replacements has a disparate impact on Black, Latinx, and Native American residents in violation of Title VI and EPA's implementing regulations, which prohibit practices "which have the effect of subjecting individuals to discrimination because of their race . . . or have the effect of defeating or substantially impairing accomplishment of the objectives of the program or activity with respect to individuals of a particular race."[13]

EPA has jurisdiction under Title VI for all of Providence Water's operations, as a result of the utility receiving EPA funding. Providence Water has received over $90 million dollars in Drinking Water State Revolving Funds since 2015. The utility also recently received a $6.4 million Water Infrastructure Improvement for the Nation Act ("WIIN") grant to replace approximately 1,400 private-side LSLs. After the WIIN funds are depleted, thousands of residences will remain exposed to lead through LSLs unless customers can finance the private-side replacement or Providence Water changes its practices.

EPA should investigate Providence Water's practices and require the utility to take action to eliminate any discriminatory effects. Specifically, EPA should direct Providence Water to monitor the impacts of its actions on Black, Latinx, and Native American residents and take proactive steps to remedy any discriminatory impacts by halting partial LSL replacements and instead conducting full LSL replacements for all residents at no cost to homeowners and landlords. It also needs to obtain community input to determine the most effective way to conduct outreach and education in the affected communities. In doing so, Providence Water would be following the example of many other water utilities across the country, including in Denver, Colorado; Cincinnati, Ohio; Washington, District of Columbia; Chelsea, Massachusetts; Lansing, Michigan; Madison and Green Bay, Wisconsin; and Newark, New Jersey. EPA must also ensure any changes in Providence Water's practices resulting from this complaint do not pose any unintended consequences to Black, Latinx, Native American, or other residents, such as stopping LSL replacements altogether.

The following organizations submit this complaint to EPA against Providence Water:

- Childhood Lead Action Project ("CLAP") has worked to eliminate childhood lead poisoning in Rhode Island through direct parent support, community education, and grassroots advocacy since 1992. We want to see every family in the state guaranteed a lead-safe place to live and raise their kids. Our Lead-Free Water RI campaign, which launched in 2021, was conceived through our coalition composed of community members and various non-profit organizations across a diverse set of backgrounds who have also contributed to this complaint.
- The South Providence Neighborhood Association ("SPNA") is a local neighborhood group whose mission is to bring together members of the South Providence community in a way that organizes, informs, and empowers residents, local businesses & organizations based in the area to form meaningful and long-term partnerships. SPNA facilitates community inclusiveness, sustainability, awareness, investment, and involvement in South Providence in order to promote a safe, multicultural, diverse, vibrant neighborhood along with carefully planned social, economic, and physical development for its unique urban community. SPNA's vision is to build interest of residents in the welfare of the neighborhood, support the improvement of the neighborhood, create awareness of issues that affect all residents of the neighborhood, encourage participation of residents in neighborhood gatherings and initiatives, and represent the neighborhood and its residents in the Greater Providence community.
- Direct Action for Rights and Equality ("DARE") has organized low-income families living in Rhode Island/ Providence communities of color for social, economic, and political justice since 1986. Their organizing has resulted in a

variety of successful campaigns including the expansion of health insurance for daycare providers, the increase of green spaces, the defeat of a sludge incinerator plan for South Providence, and ongoing mutual aid and rent assistance to community members during the COVID-19 pandemic.

- The National Center for Healthy Housing ("NCHH") is a highly regarded and credible change agent dedicated to transforming lives by transforming housing. It successfully integrates healthy housing advocacy, evidence-based research, and community capacity building to reduce health disparities nationwide by addressing their root causes. NCHH has been instrumental in the development and implementation of best practices and policies related to lead hazard control over the last 30 years. Our staff are widely regarded as international experts on the topic of childhood lead poisoning and lead hazard control.
- Environmental Defense Fund's ("EDF") mission is to preserve the natural systems on which all life depends. We have more than two million members and a staff of 700 scientists, economists, policy experts, and other professionals around the world. Guided by science and economics, we find practical and lasting solutions to the most serious environmental problems. This commitment has drawn us to areas that span the biosphere: climate, energy, oceans, ecosystems, and health. The Healthy Communities Program seeks to safeguard human health by reducing exposure to toxic chemicals and pollution, including lead.

I. Facts

A. Exposure to lead in drinking water has well-documented adverse health impacts.

Exposure to lead presents health risks for everyone. Harm occurs even at very low blood lead levels ("BLL"), and EPA has concluded that there is no safe level of exposure to lead.[14] Under its January 2021 revisions to the Lead and Copper Rule ("LCR"), EPA mandates that water utilities include the following statement in its public education materials:

> Exposure to lead in drinking water can cause serious health effects in all age groups. Infants and children can have decreases in IQ and attention span. Lead exposure can lead to new learning and behavior problems or exacerbate existing learning and behavior problems. The children of women who are exposed to lead before or during pregnancy can have increased risk of these adverse health effects. Adults can have increased risks of heart disease, high blood pressure, kidney or nervous system problems.[15]

In the United States, BLLs have significantly declined since the 1970s.[16] However, lead exposures persist. In 2020, 631 children in Rhode Island (3.2% of children screened) had BLLs at or above the Centers for Disease Control and Prevention's ("CDC") reference value of 5 µg/dL ("elevated BLLs") statewide.[17] In October 2021, CDC lowered the blood lead reference level – the definition of an elevated BLL – from 5 µg/dL to 3.5 µg/dL. This would effectively mean that more children have an elevated BLL. The BLL data presented in the complaint uses the 5 µg/dL level as a reference point.

B. Impacts of lead exposure are disproportionately seen in children of color.

Like many other public health issues, the impacts of lead exposure are not evenly distributed. Despite the substantial reduction in BLLs in the United States,[18] the most recent data show that an estimated 385,775 children had elevated BLLs (above 5 µg/dL) in 2011-2016.[19] While 2.4% of non-Hispanic Black children aged 1-5 exceeded this threshold, only 1.5% of non-Hispanic white children the same ages exceeded it.[20] A recent study analyzing the 1999 to 2010 National Health and Nutrition Examination Survey ("NHANES") data found that African-American Black children living in poverty had a 4-fold higher odds of presenting with an elevated BLL compared to white or Latinx children.[21] Researchers hypothesize this was due to the cumulative effect of environmental injustices in the built environment that expose young African-American Black children to lead as well as the lack of equitable prevention and intervention measures that center race as a risk factor.[22]

C. Impacts of exposure to lead are prevalent in Providence Water's service area.

In Providence Water's service area, 360 children had elevated BLLs in 2020 – a 4.5% elevated BLL prevalence rate based on the number screened.[23] The prevalence rate increased from the 3.4% prevalence rate in the service area in 2019.[24] Note that the total number of children tested in 2020 was lower than the number tested in 2019, most likely because of COVID-19 quarantine measures. This raises the possibility that the number of children exposed in Providence Water's service area, specifically, might be higher considering the increased time spent at home where LSLs and lead-based paint hazards are more common.

D. Drinking water is a major source of lead exposure.

Unlike most other drinking water contaminants, lead is typically not present in source waters and, therefore, cannot be removed at the water treatment plant. Instead, lead enters drinking water by leaching out of pipes, plumbing fixtures, and solder as the water moves from the main under the street to residents' taps. EPA notes that infants who mainly drink mixed formula can, on average, receive 40-60% of their lead exposure from drinking water while adults can receive 20% or more.[25]

The Rhode Island Department of Health ("RIDOH") requires children between 9 and 36 months of age to be tested for lead, at least twice within that age range.[26] Children between 3-6 years old are required to be tested annually if they are continuously exposed to lead in the home or via another exposure. Therefore, children younger than 9 months of age are not being tested for lead and their blood lead levels go unaccounted for despite being in a critical stage of development and despite the possibility of the dependence of formula made with lead contaminated water. Consequently, the population most impacted by lead in drinking water are not fully captured in the numbers in the prior sections.

Providence Water stopped using LSLs in 1945 before lead-based paint use stopped. [27] Therefore, homes with LSLs are very likely to also have lead-based paint and related dust hazards. Since there is no practical means to determine which source – LSLs or lead-based paint – is the source of an elevated BLL, a precautionary lens must be taken when assessing Providence Water's elevated lead levels, because they, indeed, are levels residents are being exposed to.

Because lead persists in the body for months and years, children can show up as having elevated BLLs even if their reliance on infant formula has ended. Therefore, it should not be assumed that other lead sources, like paint, are the sole culprit contributing to local elevated BLL prevalence rates because lead from multiple sources of exposures compounds in the body and even small amounts of lead can cause adverse effects. Thus, the contribution of lead from LSLs should be actively addressed along with every other source of lead.

E. LSLs are a significant source of lead in drinking water.

According to EPA, LSLs are "typically the most significant source of lead in the water" for homes connected to an LSL.[28] An American Water Works Association Research Foundation study funded by EPA found that the average contribution of LSLs to mass measured at the tap ranged from 48-57%.[29]

F. Elevated lead levels in drinking water are a widespread issue in Providence Water's service area.

Under the LCR regulations, a utility must conduct water sampling to test for lead from homes in a way that meets specific criteria to determine its 90th percentile level. This level is used to determine if a utility is at or above the lead action level and, therefore, must take specific actions outlined in the LCR. One of the criteria for compliance samples to be included in the 90th percentile data, under the LCR, is that the first liter of water be drawn and tested after setting at least six hours without use.[30]

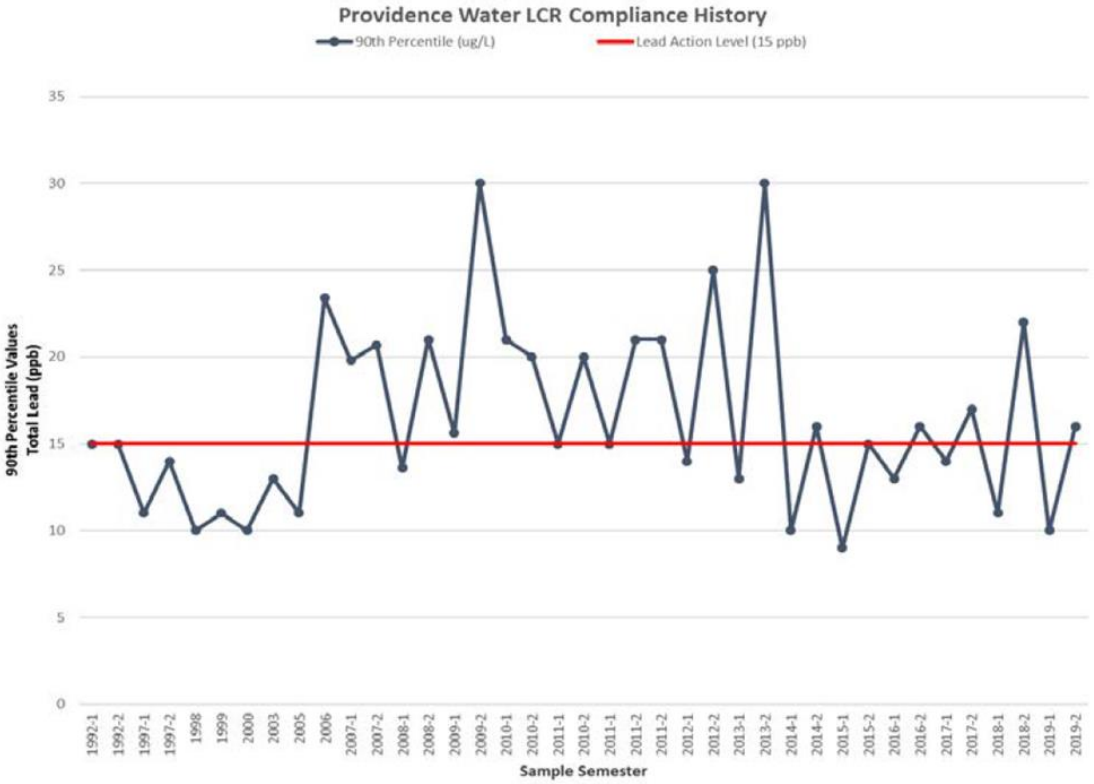
In 2005, Providence Water decreased their pH from 10.2 to 9.7. Unfortunately for customers, this pH change resulted in an LCR lead action level exceedance in 2006.

Since then, the utility has exceeded the lead action level 17 of the last 29 compliance sampling rounds[31] even after returning to a 10.2 pH and most notably that they exceeded the lead action level in 14 out of the last 15 years up until 2019.[32]

> "In 2018, PW [Providence Water] was notified by the [Rhode Island Department of Health] that we were ranked second on a national priority watch list for lead. PW was told that this list is an internal document and cannot be shared. This information was confirmed in writing by EPA Region 1."
>
> Providence Water in 2021 WIIN grant application

Figure 2, copied from Providence Water's 2021 WIIN grant application to EPA for LSL replacement, showcases the lead action level exceedances from 1998 to 2019. Alarmingly, the utility reported in the same grant application to EPA that it was recently ranked second on a national lead priority watch list for lead, according to RIDOH, although further information about this ranking is not publicly available.[33]

Figure 2: A visual representation of Providence Water's 90th percentile lead level history for sampling periods between 1991 to 2019. [34]



Source: Providence Water, *Providence Water Supply Board's Lead Service Line Replacement Program for Disadvantaged Communities - Revised Application.*

The elevated lead levels continue. Providence Water recently updated its "Lead and Drinking Water" webpage to include 2020 data. They exceeded the lead action level for the second half of 2020. The utility has now exceeded the lead action level 15 of the last 16 years.[35]

G. Water samples from homes with LSLs have elevated lead levels in drinking water.

Providence Water reports that LSL installation was discontinued in 1945.[36] Today, many of these LSLs remain distributed across the utility's service area.

Customers can visit Providence Water's website to find out whether their home has a public-side, private-side, or full LSL through the utility's interactive LSL map. A "public-side LSL" describes the part of the service line from the water main to the curb stop; a "private-side LSL" describes the part of the LSL from the curb stop to the house meter; and a "full LSL" describes the entire service line from the water main to the house meter. A depiction of an LSL is visually presented in Figure 1 above.

Within the utility's service area, there are more than 27,000 LSLs with:

- 10,800 suspected full LSLs;
- 16,400 suspected private-side LSLs; and

- 350 suspected public-side LSLs.[37]

In response to a public records request, Providence Water provided CLAP with 2020 and 2021 sample data. Of the 293 samples in the July-December 2020 data set:

- 41 samples were at or above the lead action level.
    - 33 of the 41 samples came from homes labeled as having a lead "pipe type" although it is unclear if "pipe type" refers to a public-side LSL, private-side LSL, or a full LSL.[38]

Of the 309 samples in the January-June 2021 90th percentile data set:

- 11 samples tested at or above the lead action level .
    a. 10 of the 11 samples came from homes labeled as having a lead "pipe type" although it is unclear if "pipe type" refers to a public-side LSL, private-side LSL, or a full LSL came from homes connected to an LSL. Two separate samples above the lead action level came from one home.[39]

Such high lead levels highlight the problem LSLs pose and amount of lead residents are exposed to through their drinking water. Providence Water admits they "routinely see first draw samples in excess of 100 ppb" in their water samples and that a majority of analyzed samples with high lead levels result from homes with LSLs.[40]

H. Providence Water's separate sampling program further demonstrates the problem of LSLs.

Providence Water sees similar problems with LSLs in the samples taken by customers who participate in the utility's free tap water sampling, which is distinct from their LCR compliance sampling discussed in the prior section. As with LCR 90th percentile samples, customers must allow the water to sit overnight. However, these samples are not included in Providence Water's 90th percentile level data sets because only half a liter of water is drawn, as opposed to the required one liter.[41] An additional sample, which is also a half-liter, is taken after a five-minute flush as part of the utility's free tap water sampling, for a total of two samples taken per home every time a home is sampled. Generally, the five-minute flush sample represents the water that was in the water main and flowed past the LSL without sitting in it overnight.

Data from July-December 2020 reveal the significance of the risk posed by LSLs: [42]

- Of the 1087 samples tested (usually two for each home), 127 were at or above the lead action level (79 first draw samples and 48 five-minute flush samples).
- 110 samples came from homes with confirmed LSLs (65 first draw samples and 45 five-minute flush samples)
- 9 samples tested above 100 ppb: 115 ppb (twice), 118 ppb (twice), 149 ppb, 193 ppb, 342 ppb, 430 ppb,[43] and 653 ppb.
- 8 of the 9 samples over 100 ppb were first draw samples.
    - 4 of these samples came from four separate homes connected only to a private-side LSL.
    - 3 of the samples came from two homes connected to a full LSL (multiple samples were taken on different days from one of the two homes).

- 1 sample came from a home connected a public-side copper service line and an unlabeled private-side service line.
- 1 sample came from a home connected to a full copper service line.

Most of the samples that tested over 100 ppb were first draw samples. Such high levels are shocking. A permanent solution – fully replacing LSLs – is needed to address such high levels.

Unlike the July-December 2020 data set, the January-June 2021 data set did not contain any samples that tested over 100 ppb for lead. As shown in Figure 2, lower lead levels are typical for Providence Water the January-June cycle, most likely because of cooler water temperature. Although this is good, there were still 25 samples that were at or above the lead action level, with the highest sample testing at 77 ppb, which is still concerning. Moreover, levels under the lead action level are also of concern because the lead action level is not a health-based threshold.

I. Providence Water's latest corrosion control strategy does not eliminate lead exposure in drinking water.

In an attempt to prevent lead from leaching into the water, Providence Water worked with an expert panel to develop a new corrosion control strategy for their distribution area.[44] The corrosion control strategy involves the use of orthophosphate, which creates a coating on the inside of LSLs that is meant to prevent lead from leaching into the water. Providence Water's 2021 WIIN grant application describes this corrosion control strategy, noting that a partial system demonstration study was conducted between March 2014 and December 2019 to determine the efficacy of orthophosphate in their distribution system.[45] Providence Water's website states indicates that system-wide orthophosphate application began October 2020,[46] but they include in the WIIN grant application that it can take up to 20-30 years for a fully stable crystalline scale to form on the pipes.[47]

Further, while the establishment of an effective corrosion control system is important for a utility to maintain, it does not eliminate the leaching of lead. Several studies have shown that lead continues to unpredictably leach from LSLs even under corrosion control.[48] This corrosion control strategy, although important, should not be used as justification to ignore increased lead levels that may result from partial replacements done by Providence Water.

J. Providence Water conducts regular infrastructure work on its water mains that increases the risk of elevated lead levels in drinking water.

Providence Water regularly conducts maintenance on its water mains. This infrastructure work often includes replacing or cleaning and lining the water main, which disrupt LSLs attached to it. This disturbance can lead to increased lead levels in drinking water.[49]

When encountering an LSL attached to the main, Providence Water's standard practice is to only replace the public-side LSL. The utility explicitly documents this practice in its *Water Main Rehabilitation Project Overview* noting that during water main cleaning and lining work Providence Water "remove[s] and replace[s] any lead service lines in the street with copper piping."[50] These partial replacements also occur when the utility conducts water main

replacements, where "all lead service lines are replaced from the new main to the curb line valve."[51]

K. Partial LSLs exacerbate lead exposure in drinking water.

The best way to ensure residents whose homes are connected to LSLs are not adversely impacted by construction work on water mains is to fully replace the entire LSL. EPA recently acknowledged as much by requiring in its 2021 Lead and Copper Rule revision that utilities that exceed a lead action level of 15 parts per billion receive credit only for fully replacing LSLs.[52]

Rather than conduct full LSL replacements, Providence Water, like too many utilities across the country, conducts partial LSL replacements (see Figure 1 for a visual representation of a partial LSL). Such practices are included in Providence Water's *Water Main Rehabilitation Project Overview* handout in Figure 3.

Figure 3: A portion of Providence Water's Water Main Rehabilitation Project Overview handout.

PROVIDENCE WATER

Tap Water Delivers

WATER MAIN REHABILITATION PROJECT OVERVIEW

As part of a continuing effort to improve water quality and the condition of our water system, Providence Water has hired a specialized contractor to rehabilitate the existing water mains in your neighborhood.

Please read and review the following rehabilitation processes and frequently asked questions pertaining to this upcoming project.

CLEANING & LINING PROCESS (for roads and areas with existing water mains being cleaned and cement lined)

1. Installation of temporary bypass pipe and temporary fire hydrants to provide uninterrupted water service and fire protection to those properties that will be impacted during the project.
2. Clean, disinfect, and test the temporary bypass to ensure safe drinking water.
3. Connect each property to the temporary bypass through a small hose. The process of cleaning and lining will NOT begin until all properties receive water through the temporary bypass system.
4. Dig access pits (approximately 4' x 4') to reach the water main.
5. Remove any sediment and corrosion within the water main using specialized machinery.
6. Place a new cement mortar lining throughout the cleaned water main.
7. Remove and replace old valves and fire hydrants.
8. Disinfect and test the newly cleaned and lined water main.
9. Activate the approved cleaned and lined main.
10. Reconnect any existing copper services.
11. Remove and replace any lead services in the street with copper piping.
12. Remove temporary services from each property, the temporary pipe and temporary fire hydrants.
13. Temporarily patch road excavations for the required 60 day settlement period.
14. Complete permanent road and sidewalk restoration of any area disrupted during the project.

WATER MAIN REPLACEMENT PROCESS (for roads and areas where new water mains are being installed to replace existing water mains)

1. Typically, temporary bypass piping is not required for this replacement work. The existing water main will remain in service while the new water main is installed.
2. The existing water main will provide uninterrupted water service and fire protection to our customers while the new main, valves, and hydrants are installed.
3. The new main is pressure tested for leaks. Then, the main is flushed, disinfected and sampled.
4. Once approved by our laboratory the new main is placed into service.
5. At this time all lead services are replaced from the new main to the curb line valve. Existing copper services are connected to the new main.
6. When all new services, hydrants, and valves are installed, the old main will be capped and abandoned in place.
7. A temporary shutdown will be required to complete the final water main tie-ins. 24-hour notices will be delivered to all affected customers.
8. After the required 60 day settlement time for temporary road patches, permanent road restoration of the streets and sidewalks is completed.

Source: Providence Water, *Water Main Rehabilitation Project Overview*.

Research shows that partial LSL replacements can significantly increase drinking water lead levels in the ensuing months after the replacement, even up to 6 months.[53] EPA's Science Advisory Board ("SAB") concluded a decade ago that partial LSL replacements, indeed, cause short-term lead level increases for up to several months.[54] The SAB also noted that the magnitude and duration of these increased lead levels after partial LSL replacements depend on multiple factors, including:

- the extent of disturbance of the LSL;
- the quantity and characteristics of the deposits in the LSL and downstream plumbing materials;
- the chemistry of the local water supply, including treatment to control corrosion;
- biological activity;
- localized corrosion, and more.[55]

While both partial LSL and full LSL replacements produce an increased risk of short-term elevated lead levels in drinking water, the SAB found that "[i]n water distribution systems optimized for corrosion control, full [LSL replacements] ha[ve] been shown to be a generally effective method in achieving long-term reductions in drinking water [lead] levels."[56] Because of the varying factors outlined above, SAB deduced that "[partial LSL replacements] have not been shown to be reliably effective in reducing drinking water [lead] levels."[57] Thus, from a lead exposure prevention standpoint, this conclusion must be assumed to be the case in Providence Water's service area unless there is compelling evidence that partial LSL replacements conducted by the utility result in long-term lead level reductions in drinking water.

L. Providence Water has a loan program to facilitate private-side LSL replacement.

Providence Water also has a voluntary 10-year, 0% interest loan program for homeowners and landlords whose homes are connected to an LSL. The utility uses the loan program as a way for these customers to avoid the increased risk of exposure to lead when they undergo a public-side LSL replacement, because of water main infrastructure work performed by the utility.

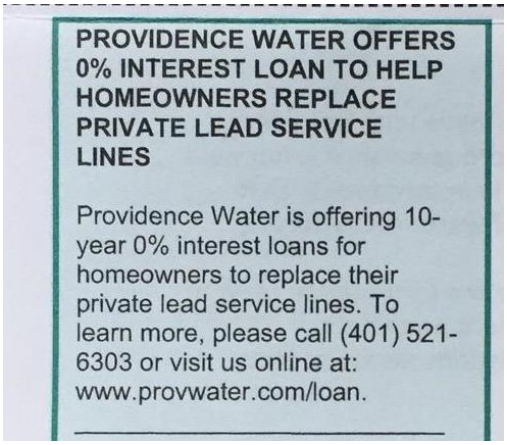
Through this program, homeowners and landlords pay the cost of private-side LSL replacement with the assurance that the cost will not exceed $4,500.[58] The cost of the public-side replacement is covered by the utility's use of funds paid by customers as part of their rates.[59] On average, private-side LSL replacements cost an average of $3,800 for loan participants.[60] The utility notes that "90% of all [private-side] replacement costs are $4,500 or less."[61]

The utility's water bills also contain a few sentences instructing customers to call the utility or to visit their website if they are interested in participating in the loan program to replace the private-side LSL connected to their home, which is seen in Figure 4.

Figure 4: A photograph of an anonymous customer's Providence Water bill promoting the utility's 10-year, 0% interest LSL replacement loan program.[62]

(b) (6), (b) (7)(C)

[redacted]



PROVIDENCE WATER OFFERS 0% INTEREST LOAN TO HELP HOMEOWNERS REPLACE PRIVATE LEAD SERVICE LINES

Providence Water is offering 10-year 0% interest loans for homeowners to replace their private lead service lines. To learn more, please call (401) 521-6303 or visit us online at: www.provwater.com/loan.

Source: An anonymous Providence Water customer.

Additionally, their website has three publicly available educational LSL handouts, two of which also promote the loan program.[63] The handout titled *Should I Replace My Lead Service Line?* (see Figure 5) explicitly states that "[a]s the property owner, you are responsible for the cost of replacing the private-side portion of the water service line" making it clear that private-side LSL replacement is the property owner's (i.e. homeowner's or landlord's) responsibility.[64]

Figure 5: A portion of Providence Water's Should I Replace My Lead Service Line? handout.

If you decide to replace your portion of the lead service line:

- ✓ **As the property owner, you are responsible for the cost of replacing the private-side portion of the water service line.** Providence Water is now offering a 10-year 0% interest loan program to help homeowners replace their private-side lead service lines. With this loan, Providence Water is offering a guaranteed, not-to-exceed price of $4,500 to replace the private-side lead service line. More information on this program is included on the second and third pages of the letter (white pages). You may also call our Lead Service Hotline at 401-521-6303.
- ✓ The cost for this private-side work includes the replacement of your existing lead service pipe **from the curb stop (shutoff valve in sidewalk or street right-of-way) to the water meter. This cost also includes the interior plumbing work, which will need to be performed in the area of the water meter.** If you choose to utilize Providence Water's 10-year 0% interest loan program, this work will be conducted by one of our approved contractors.
- ✓ It may be necessary for portions of your yard/land to be excavated during the replacement. **This land will not be returned to its original state, so you should plan to move plants and bushes ahead of time. Upon completion, landscaping restoration will be limited to loaming and seeding only.**

If you choose NOT to replace your portion of the lead service line:

- ✓ **If you choose not to replace your portion of the lead service line, it will continue to contribute lead at your tap.** Following construction lead levels may be higher and the elevated lead levels may last longer than if you had a full lead service line replacement. There are ways to minimize your exposure to this lead through flushing and filtering, but the source of lead will remain. We urge you to take note of the many lead-minimizing techniques contained on the enclosed gray-colored page "***How Can I Reduce Lead in My Drinking Water?***".

Source: Providence Water, *Should I Replace My Lead Service Line?*

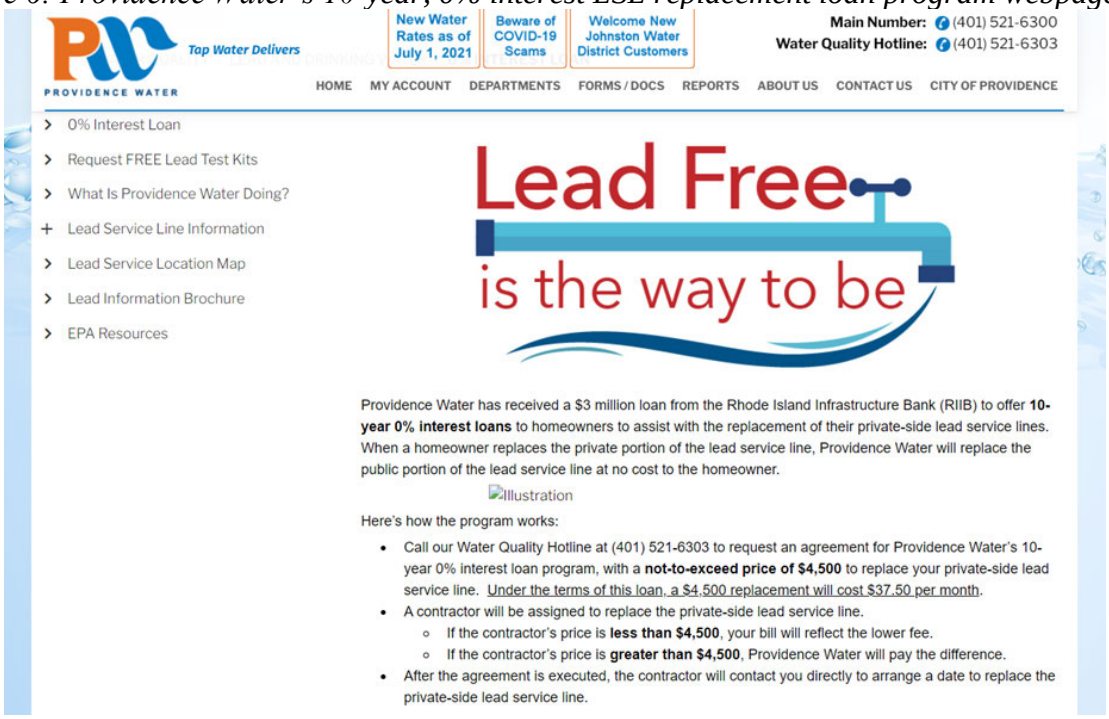
Phone calls are another opportunity Providence Water uses to promote their loan program. The utility's WIIN application notes they provide six months' worth of filters after conducting a partial LSL replacement or a full LSL replacement.[65] They add that they provide free kits for customers to take water samples for an analysis of lead levels post-replacement, either partial or full.[66]

The results are mailed to customers and calls are made to discuss the test results when there are 15 ppb exceedances to alert affected customers and residents of their elevated levels, identify potential causes of the levels, and share information about LSLs and household plumbing lead sources as well as exposure reduction techniques.[67] These are calls Providence Water uses to "strongly encourage homeowners to remove their private side lead service lines."[68]

M. Providence Water's loan program is financially inaccessible to many residents.

Providence Water's 10-year, 0% interest loan program, while helpful, is seriously flawed because it is out-of-reach for homeowners and landlords that lack the financial ability to participate in the program. A private-side LSL replacement at the maximum cost of $4,500, over a 10-year period, amounts to $37.50/month, a new, often unanticipated charge, that many customers cannot afford.

Figure 6: Providence Water's 10-year, 0% interest LSL replacement loan program webpage.



Tap Water Delivers

PROVIDENCE WATER

New Water Rates as of July 1, 2021 | Beware of COVID-19 Scams | Welcome New Johnston Water District Customers

Main Number: (401) 521-6300
Water Quality Hotline: (401) 521-6303

HOME | MY ACCOUNT | DEPARTMENTS | FORMS / DOCS | REPORTS | ABOUT US | CONTACT US | CITY OF PROVIDENCE

- 0% Interest Loan
- Request FREE Lead Test Kits
- What Is Providence Water Doing?
- Lead Service Line Information
- Lead Service Location Map
- Lead Information Brochure
- EPA Resources

Lead Free is the way to be

Providence Water has received a $3 million loan from the Rhode Island Infrastructure Bank (RIIB) to offer **10-year 0% interest loans** to homeowners to assist with the replacement of their private-side lead service lines. When a homeowner replaces the private portion of the lead service line, Providence Water will replace the public portion of the lead service line at no cost to the homeowner.

Illustration

Here's how the program works:

- Call our Water Quality Hotline at (401) 521-6303 to request an agreement for Providence Water's 10-year 0% interest loan program, with a **not-to-exceed price of $4,500** to replace your private-side lead service line. Under the terms of this loan, a $4,500 replacement will cost $37.50 per month.
- A contractor will be assigned to replace the private-side lead service line.
  - If the contractor's price is **less than $4,500**, your bill will reflect the lower fee.
  - If the contractor's price is **greater than $4,500**, Providence Water will pay the difference.
- After the agreement is executed, the contractor will contact you directly to arrange a date to replace the private-side lead service line.

Source: Providence Water, "Lead and Drinking Water" webpage.

Providence Water recognizes the problem. It repeatedly notes in their 2021 WIIN grant application that their loan program is still not always financially feasible for their customers, including those who were initially interested.[69] According to Providence Water's 2021 WIIN grant application to EPA, 335 customers received estimates in 2019 to replace the private-side LSLs at their homes through the loan program but chose not to engage due to financial constraints.[70]

Despite being aware of the loan program's unaffordability for many customers, Providence Water continues to expect homeowners and landlords to pay for the private-side LSL replacement and even uses language that blames them for elevated lead levels in their water if they don't replace the LSLs connected to their homes. The "*Should I Replace My Lead Service Line?"* and "*What Should I Expect After Construction?"* handouts available on the utility's website include the following language regarding partial replacements:

> "If you choose not to replace your portion of the lead service line, it will continue to contribute lead at your tap. Following construction lead levels may be higher and the elevated lead levels may last longer than if you had a full lead service line replacement."[71]

If homeowners and landlords only had a public-side LSL replacement done instead of a full replacement, in the first place, it is likely due to lack of affordability. The Maternal and Child Health Bureau ("MCHB") reports that there is "a large percentage of the population with incomes above the poverty level who have a difficult time meeting the high costs of housing, utilities, food, childcare, and health care in [Rhode Island]."[72] Thus, there are already many

financial barriers residents in the state face, and Providence Water's loan program is likely to be another necessity they cannot afford.

Additionally, Providence Water's loan program is not accessible to renters, who must rely on their landlords to take this step. In Providence, 60% of the population live in rented homes.[73] Understandably, landlords must be involved with construction concerning the properties they own. However, they may not choose to take out a loan they will ultimately have to pay back, for a home in which they do not live. This makes the program even more exclusionary because it is not fully accessible to all residents in Providence Water's service area, many of whom must depend on their landlords to make this public health decision on their behalf. This would present far less of a barrier if full LSL replacements were provided at no cost to homeowners and landlords.

Despite the value of the information presented in the utility's educational handouts and the follow up calls made to customers and residents whose water samples exceed the lead action level, the fact remains that Providence Water requires customers to pay for private-side LSL replacements. This practice leaves residents at risk of increased exposure to lead in drinking water when the water main infrastructure projects disturb their LSL unless they have the resources to pay for full LSL replacement. Consequently, customers who can afford to participate in the loan program have the option of replacing the LSL to avoid the harm imposed by the utility's action. Accordingly, homeowners who cannot afford to participate in the loan program and renters whose landlords cannot, or choose not to, access the loan program are exposed to the aforementioned risk of increased lead levels in drinking water.

The utility states they have "all of the tools for a successful LSLR program in place" including strategies to prepare bid documents, an efficient bidding process, prepared customer contracts and public outreach materials, a database for tracking high volumes of lead testing results, staff experienced in program management, public outreach, and construction inspections, an ability to financially track LSL replacement grant programs, the capacity to document LSL replacements in real-time, and finally, a pitcher/filter distribution program.[74] Regrettably, exposures from lead in drinking water continue to occur despite all this organizational preparation. This preparation can only go so far if customers do not have the access or financial means to pay for a private-side replacement yet are still expected to by Providence Water.

N. Residents of color experience historical economic inequities in parts of Providence Water's service area.

LSLs are likely a contributor to the larger inequities seen in elevated BLLs. An environmental justice analysis of its recent LCR revisions by EPA noted that marginal increases in drinking water lead exposure "may be more likely to result in adverse health effects, or in blood lead levels that exceed the Center for Disease Control and Prevention's ["CDC"] level of concern" because of pre-existing lead exposures from factors like race and income.[75] This dynamic was observed in the Flint water crisis, in which communities who already had higher levels of lead exposure faced greater marginal increases in BLLs than communities with less initial exposure after the city switched to a more corrosive water source which increased the amount of lead leaching out of LSLs.[76]

In Providence, similar baseline inequities appear in the form of certain residents being more likely to live in homes connected to an LSL than others. A recent United States Government Accountability Office ("GAO") report found that Providence neighborhoods with a higher proportion of people of color, renters, and families in poverty, among other characteristics, are more likely to live in a home connected to an LSL, even when controlling for home age, an LSL indicator.[77] Thus, these Providence residents face a greater risk of exposure to elevated lead levels in their drinking water.

The GAO report does not delve into why these inequities exist, but income is likely a factor. Because renters cannot access Providence Water's loan program, it can be assumed this barrier contributes to why they are more likely to live in a home with an LSL if the decision is up to the landlord. Native American, Latinx, and Black residents are 1.9, 1.5, and 1.4 times more likely to be renters than their white counterparts, respectively.[78] All of these compounded risk factors result in systematic segregation and exclusion of certain groups accessing safer drinking water.

MCHB states that Rhode Island's largest communities of color are found in six cities, including Providence and Cranston, which are in Providence Water's service area.[79] Providence is one of four core cities, defined by the organization Rhode Island Kids Count and adopted by the RIDOH, as cities with child poverty rates greater than 25%.[80] A review of census data estimates reveal that 1 in 6 children in Rhode Island lived in poverty between 2015-2019.[81] Within this time frame, 55% of all Native American children, 33% of all Latinx children (any race), and 27% of all Black children in the state lived in poverty.[82] In its 2021 "Overview of the State," MCHB acknowledges that the legacies of colonization, racism, and redlining continue to socio-economically impact Black communities and the Narragansett tribe in the state.[83] In its 2020-2024 Consolidated Plan, the City of Providence also acknowledges the history of redlining that continues to economically impact communities of color in its neighborhoods.[84]

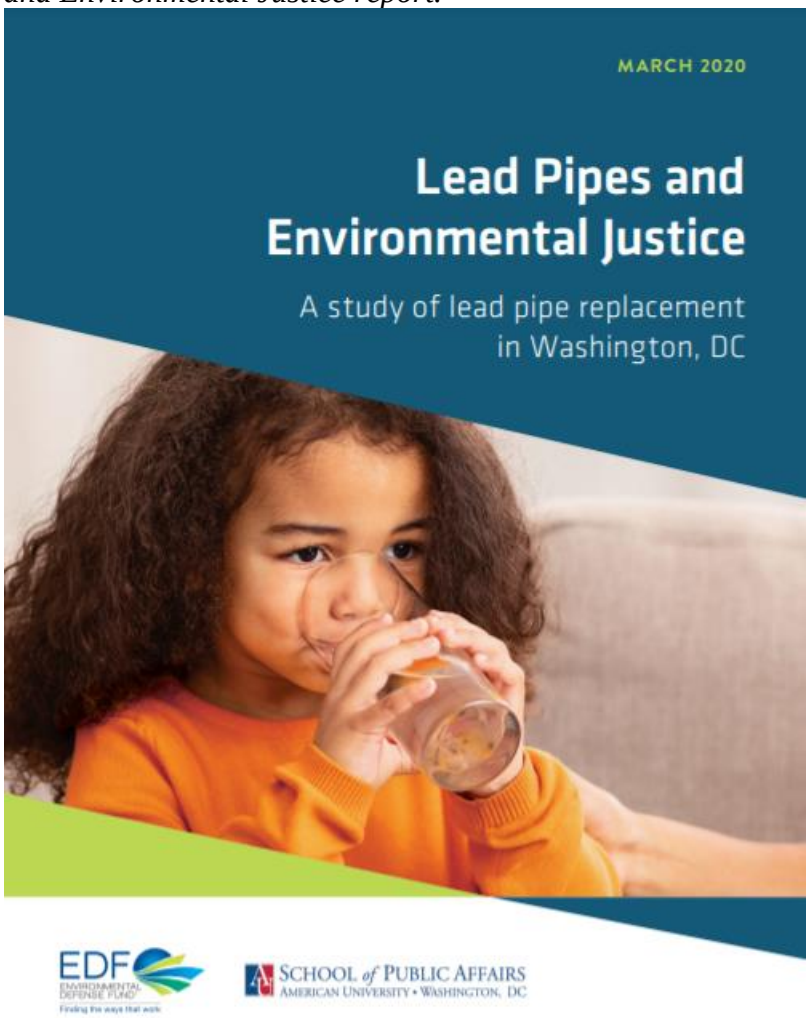
The City of Providence also acknowledges that communities of color in Providence are "disproportionately low-income, reside in neighborhoods with the lowest homeownership rates, and experience higher rates of cost burden."[85] They detail that neighborhoods where non-white, non-Hispanic populations are 85% or greater and where 75-100% of the population is considered low- to moderate-income have some of the lowest housing values and median family incomes in the city.[86] They also note these neighborhoods also have higher levels of poverty and higher percentages of households that are on public assistance compared to other areas of the city.[87]

This information highlights the inequities already present in Rhode Island and Providence, more specifically. It lays the foundation for the inequities exacerbated through programs that depend on customers' economic contributions, such as Providence Water's partial LSL replacement program.

Such inequalities have been explicitly found in similar partial LSL replacement programs, as demonstrated in a study led by Dr. Karen Baehler of American University. The December 2021 article, whose findings were first articulated in March 2020, empirically confirmed the common-sense notion that people who have a disproportionately low ability to pay for a full LSL replacement will experience disproportionate impacts from policies (like Providence Water's) that require customers to pay for a full LSL replacement.[88] The study looked at LSL replacements conducted by Washington, D.C.'s water utility, DC Water, between 2009 and

2018. At the time, DC Water, like Providence Water, required customers to pay for the private-side LSL replacement while the utility covered the public-side LSL replacement.

Figure 7: The cover page of American University and Environmental Defense Fund's March 2020 Lead Pipes and Environmental Justice report.



Source: American University, Environmental Defense Fund, *Lead Pipes and Environmental Justice*.

The study found a statistically significant relationship between lower rates of full LSL replacements in neighborhoods during planned infrastructure improvement projects and both the percentage of residents in those neighborhoods who self-identified as African American/Black and with low median household incomes.[89] In other words, the study found that when the city was doing planned infrastructure work, residents of predominantly Black neighborhoods and low-income neighborhoods were less likely to get full LSL replacements and thus more likely to be subjected to partial replacements. The study found this result despite proactive measures by DC Water to help residents get a full LSL replacement, which included negotiating a standard pricing arrangement with contractors, and offering post-replacement water sampling.

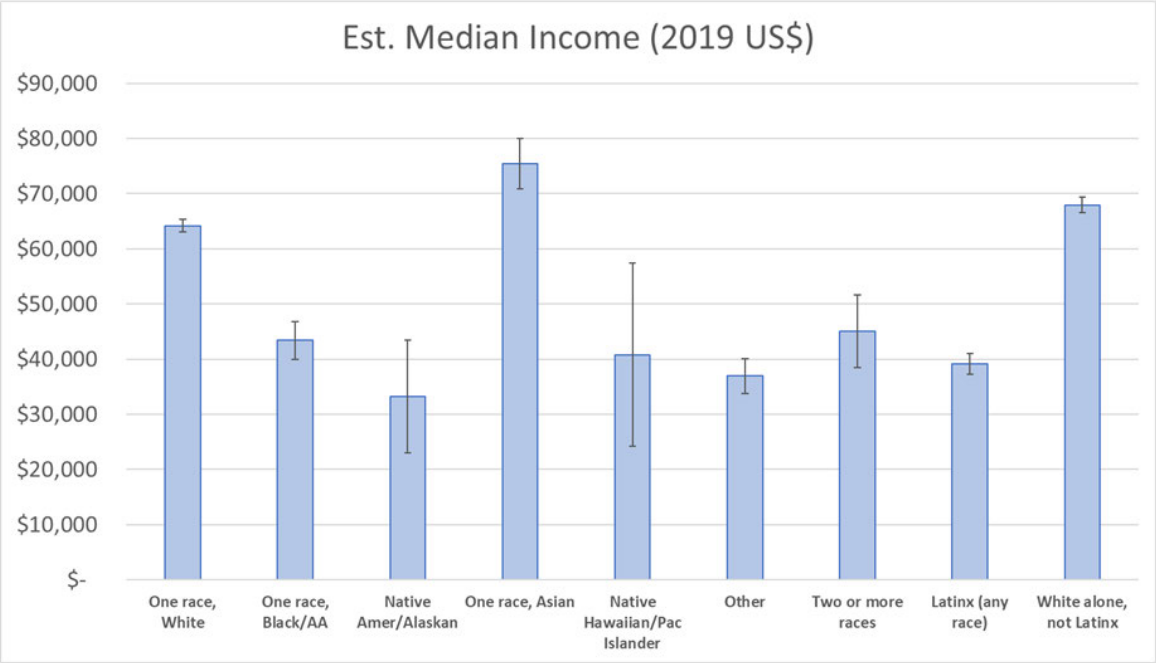
Providence Water's actions are substantially similar to DC Water's, and they have the same disparate impacts.

O. Black, Latinx, and Native American residents in Providence Water's service area have a lower financial ability to participate in the utility's loan program.

The aforementioned disparate impacts from Providence Water's loan program can specifically affect Black, Latinx, and Native American residents in the utility's service area.

An analysis of Providence County's household median income by race from the 2019 5-year American Community Survey estimates show that Black, Latinx, and Native American residents, on average, have a lower estimated median household income than white residents (Figure 8). It was not possible to identify the tribes included under "Native American" in the census tract data, but they likely include the Narragansett tribe, the Mashpee Wampanoag tribe, Mashantucket Pequot tribe, the Nipmuc Nation, and the Niantic tribe, who live in Rhode Island.

Figure 8: Providence County's Median Income Estimates from 2019 5-year American Community Survey Data by Race and Ethnicity.[90]



The figure above shows that Black, Latinx, and Native American residents in Providence County have a lower median household income than white residents.[91] On average, Native American residents actually have the lowest median household income.

The findings in Figure 8 reinforce the likelihood that the ability for Black, Latinx, and Native American residents to pay for a full LSL replacement through Providence Water's loan program is lower than it is for white residents. Therefore, these residents are disproportionately subjected to the risk of elevated lead levels in drinking water through Providence Water's disturbance of LSLs during water main infrastructure work and the associated partial LSL replacements.

CLAP arranged for a member of the American University study team determine whether there were trends associated with residents of a particular race and a lower or higher median household

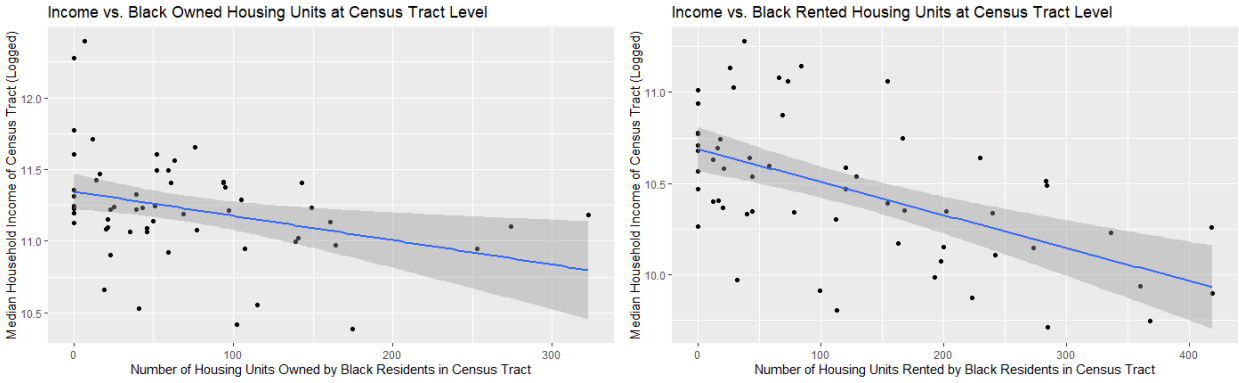
income at the census tract level in Providence Water's service area. The team member ran a Pearson Correlation analysis using census tract data from the 2015-2019 American Community Survey 5-year Estimates.[92]

The Pearson Correlation Coefficient measures the strength of a linear relationship between two variables and this strength is represented by an "r" value.[93] The "r" values are always between −1 and +1. An r = +1 value shows that as one variable increases, the other also increases (a perfect positive correlation between the two variables). An r = 0 value indicates that no correlation can be found between the two variables based on the available data. An r = −1 value showcases that as one variable increases, the other decreases (a perfect negative correlation between the two variables).

The correlations between racial characteristics of homeowners and renters of a given census tract in Providence Water's service area and the median household income of that census tract are visually presented in Figures 9-12. Each dot in the scatter plots represents a census tract in the utility's service area. The blue line is a linear trend-line, and the gray area or "band" around the trend-line represents the 95% confidence interval of the linear model estimation. The correlations between the race of residents of a given census tract and the median household income of that census tract are also presented through their "r" values in Figure 13.

It is important to highlight that income data are at the census tract level and differ by whether a home is occupied by its owner or by a renter. The income data *do not* represent the median household income for a particular racial group in the census tracts. Rather, the income data are presented *in relation* with the number of residences occupied by race in the census tracts. It is also important to note that the racial characteristics of residents are based on the identity of the "head of household" in each housing unit and not the total number of residents in each unit.

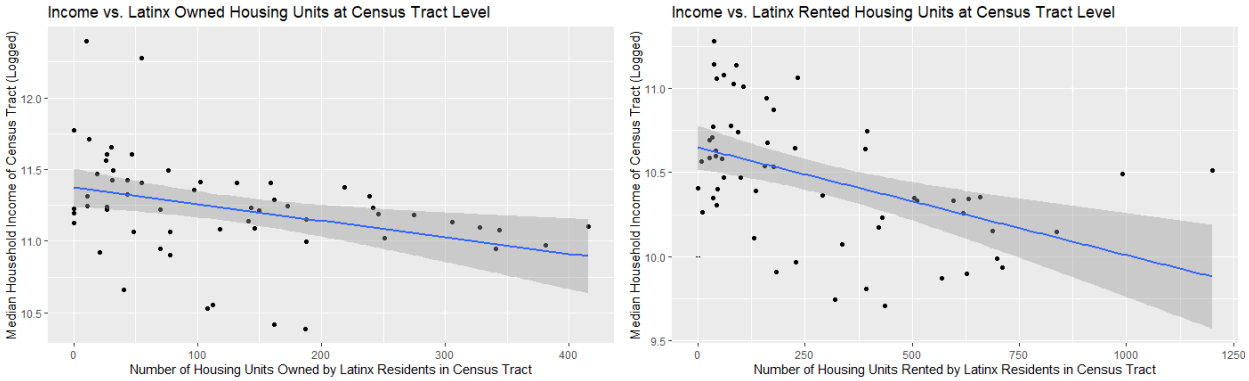
Figure 9: The correlation between income and the number of housing units occupied by Black homeowners and renters in census tracts in Providence Water's service area based on 2019 American Community Survey 5-year estimates.



The Pearson Correlation on the left-side scatterplot on Figure 9 shows that, on average, as the number of Black homeowners increases per census tract in Providence Water's service area, the median household income tends to be lower in the census tracts than if there are less or no Black homeowners. This is represented by an "r" value of -0.335.

Similarly, the scatterplot on the right-side of Figure 9 shows that when there are more Black renters in the census tracts in Providence Water's service area, the median household income tends to also be lower in the census tracts than when there are less or no Black renters. This is represented by an "r" value of -0.561, showing a stronger correlation between a lower income when housing occupants are Black renters than when they are Black homeowners.

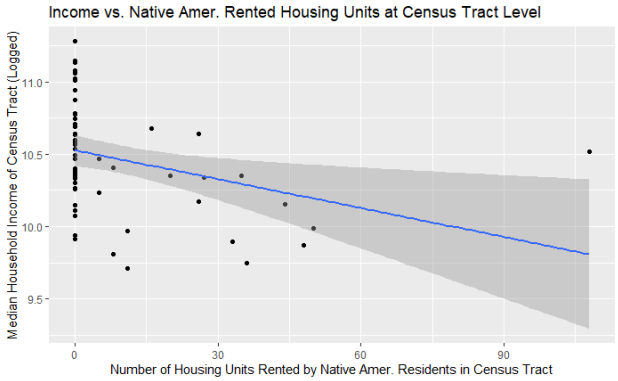
Figure 10: The correlation between income and the number of housing units occupied by Latinx homeowners and renters in census tracts in Providence Water's service area based on 2019 American Community Survey 5-year estimates.



The Pearson Correlation on the left-side scatterplot on Figure 10 shows that, on average, as the number of Latinx homeowners increases per census tract in Providence Water's service area, the median household income tends to be lower in the census tracts than when there are less or no Latinx homeowners. This is represented by an "r" value of -0.350.

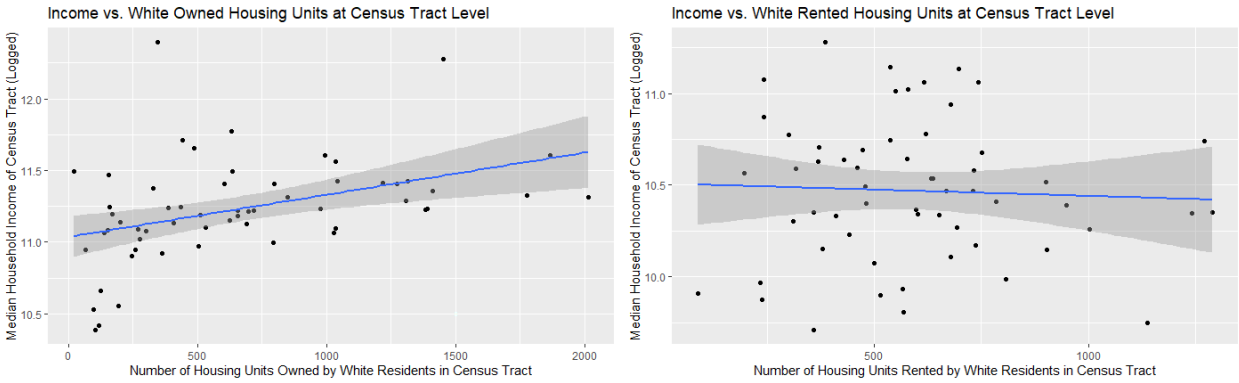
Similarly, the scatterplot on the right-side of Figure 10 shows that when there are more Latinx renters in the census tracts in Providence Water's service area, the median household income tends to also be lower in the census tracts than when there are less or no Latinx renters. This is represented by an "r" value of -0.467. A comparison of the two "r" values show a stronger correlation between a lower income when housing occupants are Latinx renters than when they are Latinx homeowners.

Figure 11: The correlation between income and the number of housing units occupied by Native American renters in census tracts in Providence Water's service area based on 2019 American Community Survey 5-year estimates.



Unlike in Figures 9 and 10, the Pearson Correlation between the number of Native American homeowners and a census tract's median household income is not presented in Figure 11 because there were not enough data to make a conclusion about that correlation. However, the Pearson Correlation displayed shows that, on average, when there are more Native American renters in the census tracts in Providence Water's service area, the median household income tends to be lower than when there are less or no Native American renters. This is represented by an "r" value of -0.329.

Figure 12: The correlation between income and the number of housing units occupied by white homeowners and renters in census tracts in Providence Water's service area based on 2019 American Community Survey 5-year estimates.



The Pearson Correlation on the left-side scatterplot on Figure 12 shows that, on average, as the number of white homeowners increases per census tract in Providence Water's service area, the median household income tends to be higher than when there are fewer white homeowners. This is represented by an "r" value of 0.409. This is the only scatterplot that shows an increase in census tract income with the increase of housing units occupied by residents of a particular race, likely because white residents have a higher median household income than Black, Latinx, and Native American residents, as shown in Figure 8.

The scatterplot on the right-side of Figure 12 shows no correlation between an increase in the number of white renters and the household median income of census tracts in Providence Water's service area. This is represented by an "r" value of -0.047. Thus, there is not much change in the household median income at the census tract level as the number of white renters increase, while there is a decrease in household median income for census tracts as the number of Black, Latinx, and Native American renters increase.

Figure 13: The Pearson Correlation values for the correlation between census tract median household income ("r") and Black, Latinx, and Native American residents.

Racial Groups	"r" Values for Owner Occupied Housing Units	"r" Values for Renter Occupied Housing Units
Black	-0.335	-0.561
Latinx	-0.350	-0.467
Native American	--[94]	-0.329
White	0.409	-0.047

This figure numerically summarizes the "r" values for the correlations between census tract median household income and Black, Latinx, and Native American homeowners and renters. As conveyed in the scatterplots, Figure 13 also exhibits that when there are more Black, Latinx, and Native American residents in a census tract, the median household income is lower, represented by a negative "r" value. By contrast, census tracts of interest with more white residents, on average tend to have higher median incomes represented by the positive "r" value for white homeowners.

These findings are of concern because they show the existing economic inequities present in Providence Water's service area. The analyses reveal that Black, Latinx, and Native American residents are less likely to be able to participate in the loan program due to financial constraints. Meanwhile, white residents in the utility's service area have greater ability to pay for private side LSL replacements because they tend to have higher household median incomes.

Additionally, the financial constraints are more pronounced for Black, Latinx, and Native American renters because they face the additional barrier of having their landlords make the decision to replace the private-side LSL of their home. This further decreases their ability to obtain a full LSL replacement. The left-side scatterplot on Figure 12 even shows that white residents are the group with the highest number of residences occupied by homeowners (there are more census tracts with over 300 residences). The percentages of owner-occupied residences and renters are revealed in Figure 14. Native American, Latinx, and Black residents in Providence Water's service area live in rented homes 1.9, 1.5, and 1.4 times more, respectively, than white residents of which 53% own the home they live in. [95] In other words, white residents have the most ability to make the decision to replace the LSL connected to their homes while 88% of Native American residents, 69% of Latinx residents, and 64% of Black residents who are the "head of household" must rely on landlords to make this public health decision on their behalf.

To attain racial equity in Rhode Island, MCHB outlines that "eliminating unjust policies, practices, attitudes and cultural messages that reinforce differential outcomes by race" is required.[96] This is exactly what Providence Water must do so all residents can obtain LSL replacements and safer drinking water.

Figure 14: The estimated percentages of housing units occupied by homeowners and renters, by race, in census tracts in Providence Water's service area based on 2019 American Community Survey 5-year estimates.[97]

Racial Groups	% of Housing Units Occupied by Homeowners	% of Housing Units Occupied by Renters
Black	36%	64%
Latinx	31%	69%
Native American	12%	88%
White	53%	47%

P. The flawed execution of Providence Water's loan program exacerbates lead exposure.

Based on anecdotal customer reports, even when someone is willing to get a loan or pay for the private-side replacement, Providence does not carefully coordinate the work. As a result, customers have an increased risk of lead exposure from the partial LSL replacement on the public-side and then a second increase when the private-side of the line is replaced. We heard the following:

- One anonymous customer participated in the loan program during the time it had a 3-year repayment timeframe compared to the current 10-year timeframe. This individual shared several concerns with the LSL replacement at her home, which are documented in Appendix B. One of the concerns is that the replacement at her home took nine months for the work to be done from when she signed up.
- A CLAP coalition member who will also remain anonymous signed up for the 10-year loan program in 2019. This coalition member noted a similar lack of timeliness as the previously mentioned customer. This loan participant shared that it took over a year to get the LSL replaced from her recently purchased home despite having a newborn baby, at the time, and other children living in the household.[98]
- During an October 2021 meeting between CLAP coalition members and Providence Water representatives, Rhode Island State Representative Rebecca Kislak brought up the experiences some of her constituents, who are also loan participants, brought to her attention: Providence Water can take over a year to replace an LSL for participants of the loan program, and the utility replaces public-side and private-side LSLs of a home on two separate occasions, sometimes months apart.[99]

In these situations, and possibly many others, loan participants waited too long for Providence Water to replace the LSLs at their respective homes, including homes with children.

The failure to ensure that public-side and private-side LSL replacements occur at the same time continues to unnecessarily expose residents to the risk of elevated lead levels in drinking water despite participating in Providence Water's loan program.

Although it will take these residents longer to receive this benefit than it should, loan participants still receive the long-term benefit of having the entire LSL connected to their homes replaced and the long-term lead levels reduced in their drinking water compared to those who do not participate in the loan program. Regardless, Providence Water can, and must, conduct synchronized full replacements for the benefit of all their customers who live in homes connected to LSLs.

II. Providence Water's Actions Violate Title VI and EPA's Disparate Impact Regulations

Title VI of the Civil Rights Act of 1964 prohibits programs or activities that receive federal assistance from discriminating on the basis of race, color, or national origin. EPA's Title VI regulations at 40 C.F.R. § 7.35(b) provide that recipients of EPA assistance:

> "shall not use criteria or methods of administering its program or activity which have the effect of subjecting individuals to discrimination because of their race, color, national origin, or sex, or have the effect of defeating or substantially impairing accomplishment of the objectives of the program or activity with respect to individuals of a particular race, color, national origin, or sex."[100]

Further, a recipient of EPA assistance may not, on the basis of race, "deny a person any service, aid or other benefit of the program or activity," "provide a person any service, aid or other benefit that is different, or is provided differently from that provided to others under the program," or "restrict a person in any way in the enjoyment of any advantage or privilege enjoyed by others receiving any service, aid, or benefit provided by the program."[101]

According to EPA's External Civil Rights Compliance Office ("ECRCO"), the elements of a *prima facie* disparate impact violation are:

1. identifying the specific policy or practice at issue;
2. establishing adversity or harm;
3. establishing disparity; and
4. establishing causation.[102]

A complainant does not bear the burden of proving adversity or of establishing the other elements; rather, EPA will determine whether they are satisfied in the course of its investigation. Nevertheless, we present here evidence that all four elements are satisfied.

A. Providence Water's LSL replacement practices during its water main infrastructure work constitute a policy or practice.

Providence Water's practice of conducting partial LSL replacements in the course of its water main repair and replacement work when homeowners and landlords cannot pay to replace the private-side LSL and when renters cannot access the utility's loan program, or whose landlords choose not to participate, constitutes a continuing policy or practice. As previously described, the utility replaces public-side LSLs at no cost to customers when conducting water main infrastructure work while requiring homeowners and landlords to pay for private-side LSL replacements. Upon receiving a notification of the water main infrastructure work, customers decide whether or not to have the private-side LSL replaced through Providence Water's 10-year, 0% interest loan program, which is not even a direct option for renters. If customers cannot or choose not to finance the loan, the water main infrastructure work continues and exposes customers to the elevated lead levels that can occur after a partial LSL replacement.

The correlation between Black, Latinx, and Native American residents having a lower household median income than white residents indicate the former are less likely to participate in the loan

program due to affordability, even with 10 years to pay the loan back.[103] The prevalence of Black, Latinx, and Native American residents renting their homes further demonstrates that many of these residents cannot participate in the loan program at all.

The 2021 WIIN grant Providence Water received from EPA that covers the cost of 1,400 private-side LSL replacements (including 350 full LSL replacements) is important to addressing this issue but insufficient considering the over 16,400 private-side only LSLs and over the 10,800 full LSLs in the utility's service area. The utility's remaining full LSLs will likely result in partial LSL replacements through the utility's main infrastructure work for those who cannot afford or cannot access the loan after the WIIN funds run out.

B. Providence Water's practices cause adverse impacts.

Any work done on a water main, including replacing it, risks disturbing attached LSLs and thus increasing lead levels in customers' drinking water.[104] A study by EPA staff, which tracked lead levels in the water of multiple households, found that households connected to LSLs that had been disturbed by infrastructure work were far more likely than other households connected to LSLs to have lead levels exceeding EPA's lead action level.[105] This result was not just true immediately after the disturbance, but for multiple subsequent test periods.[106]

Additionally, partial LSL replacements, like those Providence Water currently performs for those who cannot afford or access a full LSL replacement, worsen the effects of these disturbances by elevating drinking water lead levels in the ensuing months post-replacement.[107] Partial replacements contribute to higher BLLs in affected children in the short term.[108] Children of color already have disproportionately higher BLLs than white children.[109] In fact, these partial LSL replacements exacerbate the harm for Black, Latinx, and Native American residents who are likely unable to afford to pay for a private-side LSL replacement to mitigate the lead levels and for Black, Latinx, and Native American renters for whom the program is not accessible.

It is flawed to assume that landlords will cover the cost of Providence Water's loan program out of goodwill. They might have financial barriers of their own that prevent them from participating in the utility's loan program. It is also possible that some landlords *can* afford to participate but *choose* not to because it is economically beneficial for them not to pay out-of-pocket for the LSL replacement costs when it benefits their tenants but not themselves.

When asked if he could commit to immediately stopping partial replacements and focus on full replacements starting with areas of most need based on equity, environmental justice, and homes with children during an October 2021 meeting between CLAP and Providence Water, Mr. Caruolo, the utility's General Manager, replied that he "cannot commit going against [the] expert panel recommendation" that public partials be replaced during water main infrastructure work.[110] He expressed that the expert panel recommends public-side LSLs be replaced "whenever [the utility] ha[s] the opportunity to do so."[111]

Similarly, Katherine Mello, Senior Manager of Water Quality at Providence Water, added that the expert panel feels partial replacements are "acceptable" as long as the utility puts best management practices in place, like providing water filters, post-replacement water testing kits, and flushing instructions.[112] The utility's restricted focus on public-side LSL replacements

suggests a limited view about the utility's responsibility to protect customers from lead in drinking water.

The utility's reliance on customers financing private-side LSL replacements continues to leave tens of thousands of existing full and partial LSLs in Providence Water's service area. The loan program they have in place originally had a 1% interest rate which was reduced to 0% in the hopes of making it more accessible. The loan repayment plan was also extended from 3-years to 10-years, to again, make it more accessible to customers. Despite these efforts, the cost of private-side LSL replacements through the loan program is repeatedly noted in Providence Water's WIIN application as explicitly being a burden for many customers, resulting in low engagement numbers.[113]

C. The adverse impacts of Providence Water's practices are disproportionately borne by Black, Latinx, and Native American residents.

The key question EPA must ask in deciding whether a practice is in violation of its Title VI regulations is: "is a disproportionate share of the adversity/harm borne based on race, color, or national origin? If so, a disparity is established."[114] The answer to that question here is clearly "yes."

By requiring homeowners and landlords to pay to receive the benefits of a full LSL replacement and to avoid the increased risk of exposure to lead when they undergo a partial LSL replacement and the risk of the lead pipe that remains, Providence Water creates disproportionate health impacts. This is true because Black, Latinx, and Native American residents of Providence Water's service area tend to have less of an ability to pay for a full LSL replacement and are more likely to rent their homes compared to their white and often wealthier counterparts.

An EPA environmental justice analysis of its recent LCR revisions found that "household-level changes that depend on ability-to-pay will leave low-income households with disproportionately higher health risks" presumably because they won't have the financial ability to have the LSL in their home fully replaced compared to those who can afford this change.[115] Thus, Black, Latinx, and Native American residents in Providence Water's service area continue to be exposed to an increased risk of lead levels when the utility conducts partial LSL replacements through its water main infrastructure work as well as the risk from the lead pipe that remains.

Because of the dangers of disturbing the LSLs and the ineffectiveness and possible harm of partial LSL replacements, these actions of Providence Water at best create a health disparity by disproportionately improving the water quality of white residents. At worst, they actively harm residents who cannot afford the full replacements or whose landlords choose not to fund a full LSL replacement—a group which is disproportionately comprised of Black, Latinx, and Native American residents.

Figure 15 showcases that zip code 02906 has the highest number of agreements signed for Providence Water's loan program while other zip codes have drastically lower numbers.

Figure 15: A zip code breakdown of Providence Water's 3-year and 10-year, 0% interest loan program agreements as of October 27, 2021 in their retail service area.[116]

Zip Code	# of Signed Loan Agreements
02903	6
02904	20
02905	51
02906	242
02907	37
02908	83
02909	52
02910	46
02911	4
02917	2
02919	6
02920	14
Total:	563

While the residents of zip code 02906 make up 8.6% of the population in Providence Water's service area, they account for over 42% of signed loan agreements.[117] Data from the 2019 American Community Survey 5-year Estimates reveal that the median household income of residents in whose name a housing unit is owned or rented in zip code 02906 is $85,270.[118] This is considerably higher than that of residents across all of Providence County, which is $58,974.[119] The median household income for 02906 residents who, specifically, live in homes they own is $141,875.[120] Census data also demonstrate that 79.8% of homeowners in that zip code are white.[121] The zip code breakdown of Providence Water's loan program participants indicates that residents who are wealthy and white are disproportionately receiving the benefits of the utility's loan program while other residents are disproportionately not.

D. Partial LSL replacements cause disproportionate harm to Black, Latinx, and Native American residents.

The utility's actions are therefore "defeating or substantially impairing accomplishment of the objectives" of its infrastructure work with respect to residents of color with less financial means and providing a service to them which is "different . . . from that provided to others under the program."[122] Ultimately, because Providence Water's policies provide a disproportionate benefit to white residents while actively harming Black, Latinx, and Native American residents, the policies have "the effect of subjecting individuals to discrimination because of their race."[123]

Here, Providence Water, a recipient of federal funds, worsens the already inequitable divide in exposure to lead in drinking water. We request that EPA act, outlined in further detail below, to ensure Providence Water stops perpetuating these disparate and adverse impacts.

III. Jurisdiction

A. Title VI and EPA's implementing regulations are applicable to Providence Water.

Title VI applies to "all applicants for, and recipients of, EPA assistance in the operation of programs or activities receiving such assistance."[124] Because Providence Water is a recent recipient of EPA assistance through the Drinking Water State Revolving Fund ("DWSRF") and a WIIN grant and the utility itself meets EPA's definition of a "program," EPA has jurisdiction under Title VI for all of Providence Water's operations.

1. Providence Water is a recipient of EPA assistance.

EPA's Title VI regulations define "recipient" to include "any state or its political subdivision, any instrumentality of a State or its political subdivision . . . [or] any public or private agency . . . to which Federal financial assistance is extended directly or through another recipient."[125] "EPA assistance" is further defined as "any grant or cooperative agreement, loan, contract (other than a procurement contract or a contract of insurance or guaranty), or any other arrangement by which EPA" provides funds.[126]

One avenue by which Providence Water receives EPA assistance is through the Rhode Island Infrastructure Bank (RIIB)—which, as an entity that receives monies from EPA through the Clean Drinking Water State Revolving Fund (CWSRF) and DWSRF to distribute funds to public water systems across the state, is "another recipient"—in the form of loans as summarized in Figure 16.

Figure 16: DSWRF and WIIN Funds Distributed to or Applied for by Providence Water Between Fiscal Years 2015 to 2021.

Program	Fiscal Year	Amount	Assistance Type	Distributor
DWSRF	2015	$8 million[127]	Loan	RIIB
DWSRF	2016	$30 million[128]	Loan	RIIB
DWSRF	2017	$16.3 million[129]	Loan	RIIB
DWSRF	2018*	$1 million[130]	Loan	RIIB
DWSRF	2019*	$14.7 million[131]	Loan	RIIB
DWSRF	2020	$19.1 million[132]	Loan	RIIB
DWSRF	2020*	$3 million[133]	Loan	RIIB
WIIN	2021*	$6.4 million[134]	Grant	EPA
DWSRF	2022 (Anticipated Loan)	$21 million[135]	Loan	RIIB
Total Loan and Grant Funds Awarded, excluding 2022:		$98.5 million		

**Denotes funds used by Providence Water to address LSLs.*

The DWSRF loans awarded in fiscal years 2018, 2019, and one of the loans ($3 million) awarded in 2020 were used for LSL replacements. The funds from the 2018 DWSRF loan were used to develop a pilot for Providence Water's 0% interest loan program in an effort to help customers replace private-side LSLs.[136] The 2020 $3 million DWSRF loan allowed Providence Water to expand the 0% interest 3-year program into a 10-year program.[137] As presented in this complaint, these 10-year, 0% interest loans are still not affordable to many customers in the utility's service area which can be why they struggle with low number of customers taking advantage of their program.

The WIIN grant is another avenue by which Providence Water receives EPA assistance, which is also detailed in Figure 16. This WIIN grant was awarded to the utility in 2021 to cover the costs of private-side LSL replacements within their service area[138] in opportunity zones (defined by the United States Department of Treasury as "economically distressed communit[ies] where new investments, under certain conditions, may be eligible for preferential tax treatment,")[139] and disadvantaged communities (defined by the State of Rhode Island as such under the affordability criteria established by the State under section 1452(d)(3) of the Safe Drinking Water Act or that may become disadvantaged communities as a result of carrying out a project or activity). The work to replace the private-side LSLs using these grant funds is yet to begin.[140]

2. Providence Water is a program or activity covered by Title VI and EPA has jurisdiction over all its operations.

EPA's regulations define a "program" to include "all of the operations of any entity . . . *any part of which* is extended Federal financial assistance," including any "department, agency, special purpose district, or other instrumentality of a State or of a local government."[141] Thus, because Providence Water is a department of the City of Providence and, as established above, Providence Water receives EPA assistance directly and through the RIIB, all of its operations are subject to Title VI and EPA's implementing regulations, even if EPA's assistance is not used specifically to pay for the water infrastructure projects addressed by this complaint.

3. The complaint is timely.

This complaint is timely because it was filed within 180 days of the discriminatory action.[142] Because the alleged discriminatory action is an ongoing policy or practice, the whole of which is in violation of Title VI, a complaint is timely when the policy or practice has been in operation within the last 180 days.[143] Providence Water has an ongoing practice of replacing water mains and is constantly in the process of such work. The utility describes such infrastructure work as a recent construction project – running from late March to November 2021– on its website for the cities of Providence and Cranston.[144] Their *Water Main Rehabilitation Project Overview* explicitly includes public-side LSL replacements: "[at the time water mains are replaced] all lead services are replaced from the new main to the curb line valve."[145] Therefore, the policy has operated in the last 180 days.

IV. Relief

Complainants request that EPA direct Providence Water to take action to ensure that the ongoing violations of Title VI described above are eliminated. Specifically, complainants request that EPA direct Providence Water to actively monitor the impacts of its actions on Black, Latinx, and Native American residents and take proactive steps to remedy the discriminatory impacts.

The most efficient way for Providence Water to do this is to stop conducting partial LSL replacements during its water main infrastructure work and instead conduct full LSL replacements for all residents at no cost to customers. These full replacements should be synchronized so the public-side LSL and the private-side LSL are replaced at the same time in order to avoid putting residents in the position of risking increased lead levels on two separate occasions. Given the public purpose of preventing discrimination and protecting public health, Providence Water should be able to fund such a program through "federal and state programs that may be used to fund [LSL replacement] programs including the cost of [LSL replacement] for customer-owned LSLs"[146] and also ratepayer funds.[147]

EPA must ensure any changes in Providence Water's practices resulting from this complaint do not pose any unintended consequences to Black, Latinx, Native American, or other residents. Because of the current and clear disparate impacts of Providence Water's infrastructure work, the utility must monitor the racial and economic impacts on residents going forward, including the impacts of proposed practices, before any changes are implemented. Thus, we recommend that

Providence Water's loan program remain in place until it is replaced with a more equitable initiative that prioritizes Black, Latinx, and Native American residents.

Providence Water should also actively track and provide relevant information to landlords *and* tenants, including where its remaining LSLs are located, where it is conducting partial LSL replacements and water main infrastructure work, who is being impacted by this work, and how partials can increase lead levels in drinking water. Doing so is necessary to ensure that its actions do not further aggravate the inequitable harms of LSLs.

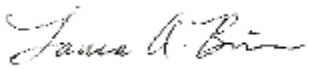
In addition to these LSL replacement practices, Providence Water should also work with community organizations to obtain community input to determine the most effective way to conduct outreach and education in such a way that prioritizes communities with larger Black, Latinx, and Native American populations who are disproportionately exposed to lead in drinking water (in multiple languages where relevant), actively and continually informing them of the risks of lead in water and providing the tools and information they need to reduce the risks.

All of these actions are in line with agreements into which EPA has entered in the past. For example, EPA agreed to an LCR variance for Denver Water that mandated Denver Water develop an inventory of LSLs in its system, only conduct full LSL replacements, and implement a communications, outreach, and education plan directed at affected communities.[148]

We therefore request that EPA initiate a Title VI investigation of Providence Water to address these practices. We welcome the opportunity to meet with you to discuss the concerns and recommendations raised in this letter.

Sincerely,

Childhood Lead Action Project ("CLAP")



Laura Brion – Executive Director
(401) 785-1310
laura@leadsafekids.org

South Providence Neighborhood Association ("SPNA")
Dwayne Keys – President
(401) 369-1334
southprovneighbors@gmail.com

Direct Action for Rights and Equality ("DARE")
Christopher Samih-Rotondo – Interim Director
(401) 351-6960
crotondo@daretowin.org

National Center for Healthy Housing ("NCHH")

Amanda L. Reddy – Executive Director
(443) 539- 4152
areddy@nchh.org

Environmental Defense Fund ("EDF")

Tom Neltner – Senior Director, Safer Chemicals
(202) 572- 3263
tneltner@edf.org

Appendix A: A Summary of the Census Tracts Not Included in the Pearson Correlation Demographic Analysis of Providence Water's Service Area

The census tracts below were not included in the Pearson Correlation demographic analysis for either of these reasons: 1) Certain residential buildings, like apartment complexes and college dormitories, typically never had LSLs due to the size of such service lines which are smaller than what is needed to provide water to every resident, and 2) there were 15 or less LSLs according to Providence Water's online LSL map.

City/Town in Providence Water's Service Area	Census Tract Not Included in Correlation Analysis	Reason Why Census Tract Was Not Included
Providence	8	An inspection via Google Maps suggested the residential units in this census tracts are mostly composed of college dormitories and apartment complexes. The 2019 5-year American Community Survey estimates confirmed this: 94% of residential buildings are composed of 20+ units.
Cranston	142	This tract is not included because it had 3 suspected or confirmed LSLs as of October 08, 2021.
	144	This tract is not included because it had 5 suspected or confirmed LSLs as of October 08, 2021.
	145.01	This tract is not included because it had 14 suspected or confirmed LSLs as of October 08, 2021.
	146	This tract is not included because it had 1 suspected or confirmed LSL as of October 08, 2021.
Eastern Part of Smithfield	126.02	This tract is not included because it had 5 suspected or confirmed LSLs as of October 08, 2021.
North Providence	119.02	This tract is not included because it had 5 suspected or confirmed LSLs as of October 08, 2021.

Appendix B: Letter from Loan Program Participant[149]

I'm a recipient of a 0% interest, 3-year loan from Providence Water to replace the lead service line (b) (6), (b) (7)(C) [redacted] I first heard about the lead service line loan program from a notice that Providence Water includes with water bills.

Obviously a loan with 0% interest is much more affordable than any loan I could have gotten through a bank; I don't think I could have gotten it done more cheaply and I value having much less lead in my water. I think the utility checked my bill payment history before approving me for the loan program. (I always pay my water bill on time, but I know some people make payments late for a variety of reasons, and I'm not sure if this loan would be available to them.)

I decided to sign up because I want to reduce my lead exposure. I know that my house is full of lead paint, and I also grew up in a house that was full of lead paint, so my lifetime lead exposure has been high – I figure that any changes I can make to reduce this would be positive. I also looked at a GIS map from Providence Water and found that the public water line at my house (from the water main in the road to the sidewalk) was lead, and the water utility said they would replace their side at the same time if I paid to have mine done, since the road would already be dug up. (Note: this map still says that my water line is "suspected or confirmed lead" although I watched them replace it, so I don't know how accurate the map is.)

I signed up for the program (b) (6), (b) (7)(C) The first step was that I applied for the loan and got approved. The work has to happen through their designated vendor, so Providence Water was the intermediary for scheduling the work. Someone from the contractor came (b) (6), (b) (7)(C) [redacted] which included the new pipe, labor, a sidewalk permit fee, a fee to furnish and place a new sidewalk, and payment for a police officer to direct traffic around the dug-up street.

(b) (6), (b) (7)(C) [redacted] I first applied for the program and when the work was done to replace my lead line. I spoke to people at Providence Water a lot of times during that period, both to work out details and to ask them if and when the work was going to happen. (b) (6), (b) (7)(C) [redacted] I'm lucky that I have a job where I can pause to make phone calls during the day. Once I got the name of the person I had to talk to, it became much easier to get ahold of her. She was friendly and helpful with my questions but never knew exactly how long it would be before I'd be able to get the work done. She also called to follow up after the work was done, which I appreciated.

The full replacement (public and private) was done at once –they dug up the street all the way to the water main and replaced both the part that the city owns (from water main to sidewalk) and the part that I own (from sidewalk into my house). I only found out the day before the work was going to be done; someone called in the afternoon and told me it would start the next morning. [redacted]

I could leave a little early that day without any consequences. (b) (6), (b) (7)(C) [redacted]

(b) (6), (b) (7)(C) [redacted] and it was LOUD and shook my house! I guess they had a hard time getting the old pipes out from under the road – (b) (6), (b) (7)(C) [redacted] since I imagine the labor was much more than they had initially planned on, but the part they had trouble with was all in the street which I think is the section of the line that the city owns, not my part.

The day of the replacement, someone from Providence Water left me a "care package" with a water pitcher, several filters, and detailed instructions for flushing and filtering my water, including information about how lead levels would RISE significantly over the first few days before dropping. (b) (6), (b) (7)(C) [redacted] Luckily I already had a filter on my faucet, so I cleaned out the aerators on all my faucets every day for a few days and just used my existing filter. The information they gave me was very thorough. I don't remember if it came in multiple languages, though.

(b) (6), (b) (7)(C) [redacted] I called to follow up and they told me they'd send someone in the future but they never did (although I only called to ask about it once) so there's still just dirt around where my water line comes in from the street – I do really need to seal it up with cement some time soon. Also, the estimate included fixing the sidewalk with concrete, but they actually patched it up with sticky bituminous asphalt. That portion of my sidewalk remained bituminous for maybe a year or two until one day I heard a loud sound and looked out the window to see a crew from the city replacing it with concrete. (Now it looks great! But in the meantime it looked bad!)

I know that some of my neighbors have had full replacements done since I had mine done, only because I've seen the trucks and the street all dug up. None of them happened the same day or week, though.

I will say that the payment system for the loan program is super weird and confusing. (I also didn't get my first bill for the loan payments until (b) (6), (b) (7)(C) after the work was completed; I called Providence Water a few times during the interim to make sure they weren't sending the bill to the wrong house or something.) Providence Water sends me what looks like a water bill every month (in addition to my actual water bill) but it shows a consumption rate of 0 and the bill amount is the remaining portion of the loan (i.e. an alarmingly-large number). I have to remember what my monthly loan payment amount is and send in a check for just the monthly payment. Nowhere on the bill does it say that it's for the lead service line replacement and I was really confused when I got my first one! Also, a few times I've paid my monthly amount but then

gotten an automated late notice from Providence Water saying that the remaining portion of the loan amount was overdue; when I've called to ask about it, the person I've talked to says "Oh, that's just automated, don't worry about it. If you're making your monthly loan payment you're fine." The late payment notices are alarming!

Overall, I'm glad to have had access to something to make my home a little safer; I have a fairly low income so bigger home improvements like this are often difficult or out of reach for me. That said, I also wish the city or state was more proactive about replacing their utility-owned lead piping instead of expecting citizens to initiate the process, do part of the legwork, and pay for some of the permitting. The process was long and annoying and required a lot of phone calls, and I'm not sure that renters in the city often even know that their homes have lead pipes, which is awful. I don't know if this program would be accessible to someone with a less-flexible job than mine but I'm grateful for my safer water.

---

[1] David A. Cornwell et al., *National Survey of Lead Service Line Occurrence*, 108 AM. WATER WORKS ASS'N E182, E182 (2016); National Primary Drinking Water Regulations: Lead and Copper Rule Revisions, 86 Fed. Reg. 4198, 4199 (Jan. 15, 2021).

[2] Providence Water, *Providence Water Supply Board's Lead Service Line Replacement Program for Disadvantaged Communities - Revised Application* at 5 (Jan. 19, 2021) https://drive.google.com/file/d/1SUWLuFclJNftt9VsSZE2-JjNff7zAOw-/view?usp=sharing.; The estimated 27, 500 LSLs is attained by adding the 350 public-side LSLs, 16,400 private-side LSLs, and 10,800 suspected full LSLs.

[3] Abt Associates, *Environmental Justice Analysis for the Proposed Lead and Copper Rule Revisions*, Docket No. EPA-HQ-OW-2017-0300-0008, 8–12 (2019), https://www.regulations.gov/document/EPA-HQ-OW-2017-0300-0008.

[4] United States Government Accountability Office, *EPA Could Use Available Data to Better Identify Neighborhoods at Risk of Lead Exposure*, GAO-21-78, 12–18.; The GAO report uses the term "minority populations" which was changed here to "people of color." Communities of color make up the majority of the population in Providence and are, therefore, not minorities.

[5] Providence Water, "Lead and Drinking Water," https://www.provwater.com/water_quality/lead-center.

[6] Providence Water, *Revised Application* at 12.

[7] *Id.* at 5.

[8] National Primary Drinking Water Regulations: Lead and Copper Rule Revisions, 86 Fed. Reg. at 4259.; EPA, *Integrated Science Assessment for Lead*, at lxxxviii (2013).; A working paper for the National Center for Environmental Economics reported that lead is also a risk factor for cardiovascular disease and mortality in adults. Ana Navas-Acien, *Lead and Cardiovascular Mortality: Evidence Supports Lead as an Independent Cardiovascular Risk Factor*, National Center for Environmental Economics at 9 (May 2021), https://www.epa.gov/system/files/documents/2021-09/2021-03.pdf.

[9] Providence Water, *Water Main Rehabilitation Project Overview*, https://www.provwater.com/sites/default/files/inline-files/WMR%20Handout%202021%20-%20Updated.pdf.

[10] EPA Science Advisory Board, *Evaluation of the Effectiveness of Partial Lead Service Line Replacements* (2011), https://www.epa.gov/sites/production/files/2015-09/documents/sab_evaluation_partial_lead_service_lines_epa-sab-11-015.pdf.; Miguel A. Del Toral, Andrea Porter, & Michael R. Shock, *Detection and Evaluation of Elevated Lead Release from Service Lines: A Field Study*, ENVTL. SCI. & TECHNOLOGY 9300, 9304 (2013).; Rebecca Renner, *Reaction to the Solution: Lead Exposure Following Partial Service Line Replacement*, 118 ENVTL. HEALTH PERSP. A202, A206 (2010).

[11] Karen J. Baehler, Marquise McGraw, Michele J. Aquino, Ryan Heslin, Lindsay McCormick, & Tom Neltner, *Full Lead Service Line Replacement: A Case Study of Equity in Environmental Remediation,* Sustainability 14, 352 (2022), https://doi.org/10.3390/su14010352.
[12] Latinx is the gender-neutral term for "Latino" and will be used in this complaint to be more inclusive.
[13] 40 C.F.R. § 7.35(b).
[14] 86 Fed. Reg. at 4199.
[15] *Id.* at 4198, 4294.
[16] EPA, ACE: Biomonitoring – Lead, Indicator B1 "Lead in children ages 1 to 5 years: Median and 95th percentile concentrations in blood, 1976-2016," https://www.epa.gov/americaschildrenenvironment/ace-biomonitoring-lead (Aug. 2019).
[17] Rhode Island Department of Health, Childhood Lead Poisoning Prevention Program, *EBLL Prevalence by City 2020*- Public Records Request (Feb. 11, 2021).
[18] EPA, ACE: Biomonitoring – Lead, Indicator B1.
[19] Kathryn B. Egan, et al., *Blood Lead Levels in U.S. Children Ages 1-11 Years, 1976-2016*, 129 ENVTL. HEALTH PERSP. 037003-4 (2021), https://ehp.niehs.nih.gov/doi/10.1289/EHP7932.
[20] *Id.* at 7.
[21] Deniz Yeter, et al., *Disparity in Risk Factor Severity for Early Childhood Blood Lead among Predominantly African-American Black Children: The 1999 to 2010* US NHANES. INT. J. ENVIRON. RES. PUBLIC HEALTH. 17 (5): 1552 (2020), https://www.ncbi nlm nih.gov/pmc/articles/PMC7084658/.; The study draws the comparison between African-American Black children and white or Hispanic children. The latter term is changed here from "Hispanic" to "Latinx" for consistency in describing the same group of people in this document.
[22] *Id.* at 16 and 20.
[23] Rhode Island Department of Health, *EBLL Prevalence by City 2020.*
[24] Rhode Island Department of Health, Childhood Lead Poisoning Prevention Program, *EBLL Prevalence by City 2019*- Public Records Request (Feb. 17, 2020).
[25] EPA, "Basic Information about Lead in Drinking Water," https://www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water (Oct. 15, 2021).
[26] Rhode Island Department of Health, "Healthy Homes and Lead Poisoning Information for Parents," https://health.ri.gov/healthrisks/poisoning/lead/for/parents/.
[27] Providence Water, *Revised Application* at 3.; Providence Water, "FAQ- Lead FAQ," https://www.provwater.com/faq.; Page 13 of the previously cited GAO report states that Providence Water stopped the use of LSLs in 1940 while Providence Water's *Revised Application* states LSL installation was discontinued in 1937. The utility's FAQ webpage states "Homes constructed before 1945 may have lead service lines" so we used 1945.
[28] EPA, "Basic Information about Lead in Drinking Water."
[29] American Water Works Association Research Foundation, *Contribution of Service Line and Plumbing Fixtures to Lead and Copper Rule Compliance Issues* 50 (2008), https://archive.epa.gov/region03/dclead/web/pdf/91229.pdf.
[30] 40 CFR § 141.86.
[31] Providence Water, *Revised Application* at 5.
[32] *Id.* at 2.
[33] *Id.* at 12.
[34] *Id.* at 5.; There are two sampling periods (or semesters) per calendar year. The data for 1998 to 2006 are only presented per year and not per sampling period. Additionally, no data is presented for 1993-1996, 2001, and 2002.
[35] Providence Water, "Lead and Drinking Water."
[36] Providence Water, *Revised Application* at 3.; Providence Water, "FAQ- Lead FAQ," https://www.provwater.com/faq.; See endnote #27 for information about 1945.
[37] *Id.* at 5.
[38] Providence Water, *Water Quality Monitoring: 90th Percentile Report Batch ID: 2020-2*- Public Records Request *(Oct. 27, 2021)*.
[39] Providence Water, *Water Quality Monitoring: 90th Percentile Report Batch ID: 2021-1*- Public Records Request *(Oct. 27, 2021)*.
[40] Providence Water, *Revised Application* at 5.

[41] This information was inferred from the labeling for first draw and five-minute flush sample results in the 2020 data set. The samples are labeled "1st Draw.5L" and "5MF.5L," respectively, and we infer that the ".5L" refers to a half-liter draw for each sample.
[42] Providence Water, *Non Tier 1 Report – No Repeat PO_4 Results Batch ID: 2020-2*- Public Records Request (Oct. 27, 2021).
[43] A first draw water sample with a lead level of 430 ppb is listed twice in Providence Water's data set. It appears to be a duplicate which is why it is only accounted for once in this document.
[44] Providence Water, *Revised Application* at 2.; This expert panel was created in 2012 to understand and advise the utility on their lead action level exceedances.
[45] Providence Water, *Revised Application* at 7.
[46] Providence Water, "Providence Water Improving Water Treatment," https://www.provwater.com/water_quality/orthophosphate.
[47] Providence Water, *Revised Application* at 8.
[48] Del Toral et. al., *Detection and Evaluation of Elevated Lead Release from Service Lines*.; Lauren W. Wasserstrom, Stephanie A. Miller, Simoni Triantafyllidou, Michael K. DeSantis, and Michael R. Schock, *Scale Formation Under Blended Phosphate Treatment for a Utility with Lead Pipes*, J. Am. Water Works Assoc. E464–E478 (2017).
[49] Del Toral et. al., *Detection and Evaluation of Elevated Lead Release from Service Lines*.
[50] Providence Water, *Water Main Rehabilitation Project Overview*.
[51] *Id.*
[52] 86 Fed. Reg. 4198, 4293.
[53] Benjamin F. Trueman, Eliman Camara, & Graham A. Gagnon, *Evaluating the Effects of Full and Partial Lead Service Line Replacement on Lead Levels in Drinking Water*, ENVTL. SCI. & TECHNOLOGY 7389, 7393, 7394 (2016).
[54] EPA Science Advisory Board, *Evaluation of the Effectiveness of Partial Lead Service Line Replacements* at 13.
[55] *Id.* at 10.
[56] *Id.* at 14.
[57] *Id.* at 15.; "[Partial LSL replacements] have not been shown to be reliably effective in reducing drinking water Pb levels, at least in the time frames of the reported studies."
[58] Providence Water, "0% Interest Loan," https://www.provwater.com/water_quality/lead-center/loan.
[59] Childhood Lead Action Project. *10/7/21 Meeting w/ ProvWater – Notes* 3 and 5 (Oct. 7, 2021).
[60] Providence Water, *Revised Application* at 18.; In comparison, the cost per public-side LSL replacement is approximately $4,850. This amount is based on Providence Water's estimate that the cost for the public-side replacement of 350 LSLs is S1.7 million.
[61] *Id.*
[62] Anonymous, Providence Water bill, (2021).
[63] Providence Water, "Lead Service Replacement Handouts," https://www.provwater.com/water_quality/lead-center/leadhandouts.
[64] Providence Water, *Should I Replace My Service Line?*, https://www.provwater.com/water_quality/lead-center/shouldireplaceleadline.
[65] Providence Water, *Revised Application* at 13.
[66] *Id.* at 10.
[67] *Id.*
[68] *Id.*
[69] Providence Water, *10-Year 0% Loan Agreements*- Public Records Request (Oct. 27, 2021).; The document lists a total of 563 agreements signed as of October 27, 2021. However, the list of residences listed under the loan agreement is 457. This discrepancy is not explained in the document.
[70] Providence Water, *Revised Application* at 9.
[71] Providence Water, *Should I Replace My Service Line?*; Providence Water, *What Should I Expect After Construction?*, https://www.provwater.com/water_quality/lead-center/whattoexpectafterconstruction.
[72] HRSA Maternal & Child Health Bureau, "III.B. Overview of the State - Rhode Island – 2021," (2021), https://mchb.tvisdata hrsa.gov/Narratives/Overview/f82b453a-e199-425e-918f-5ebb4a6bc0ec.
[73] HousingWorkRI, 2021 Housing Fact Book (2021), https://www.housingworksri.org/Portals/0/Uploads/Documents/FINALHFB21-revised_2021-11-

02.pdf?ver=s3DdsTMeA07Fq-D28P9x1A%3d%3d.; This statistic was obtained by taking the average of the two renting percentages provided on page 66 (66%) and page 67 (53%) of the fact book. This was done to obtain the percentage of renters in all of Providence, since HousingWorksRI divide their data between the East Side neighborhood in Providence and the rest of the city.

[74] Providence Water, *Revised Application* at 2 and 14.

[75] Abt Associates, *Environmental Justice Analysis for the Proposed Lead and Copper Rule Revisions* at 6.

[76] *Id.* at 7 ("The Flint case study thus demonstrates that increases in drinking water lead levels can have a disproportionate impact on environmental justice populations.").

[77] United States Government Accountability Office, *EPA Could Use Available Data to Better Identify Neighborhoods at Risk of Lead Exposure* at 18.

[78] See Figure 14 on page 24.

[79] HRSA Maternal & Child Health Bureau, "Overview of the State."

[80] Rhode Island Department of Health, *Guidelines for Adoption of New Core City Designation*, (2012), https://health.ri.gov/publications/guidelines/CoreCityData.pdf.

[81] U.S. Census Bureau, "Poverty Status in the Past 12 Months By Age," 2015-2019 American Community Survey 5-year Estimates (Rhode Island), Table B17020 (accessed Dec. 08, 2021), https://data.census.gov/cedsci/table?q=Table%20B17020&g=0400000US44&tid=ACSDT5Y2019.B17020.; Data was assessed for children under 18 years of age.

[82] U.S. Census Bureau, "Poverty Status in the Past 12 Months by Age," 2015-2019 American Community Survey 5-year Estimates (Rhode Island), Table B17020C (American Indian or Alaska Native alone); Table B17020I (Hispanic or Latino any race); and Table B17020B (Black or African American alone) (accessed Dec. 08, 2021).; Data was assessed for children under 18 years of age.

[83] HRSA Maternal & Child Health Bureau, "Overview of the State."

[84] City of Providence Department of Planning and Development, 2020-2024 Consolidated Plan, 2020-2021 Annual Action Plan, 134 (2021), https://www.providenceri.gov/wp-content/uploads/2021/02/2020-2024-City-of-Providence-Consolidated-Plan.pdf.

[85] *Id.*

[86] *Id.* at 134-139.

[87] *Id.* at 139.

[88] Baehler et. al., *Full Lead Service Line Replacement: A Case Study of Equity in Environmental Remediation*.

[89] *Id.*; The study also looked at emergency repair work. However, because there was less data for those repairs, the results were not statistically significant.

[90] U.S. Census Bureau, "Median Income in the Past 12 Months (In 2019 Inflation-Adjusted Dollars) -- Providence County, Rhode Island" 2015-2019 *American Community Survey 5-year Estimates*, Table S1903.; This data is at the county level as opposed to Providence Water's service area, specifically, due to census data accessibility limitations for race- and ethnicity-specific income data at the census tract level.

[91] The categories of "other" and "two or more races" also have a median household income lower than white residents, but it was not possible to obtain more detailed information about what races were captured under these terms.

[92] U.S. Census Bureau, "Demographic Characteristics for Occupied Housing Units -- Providence County, Rhode Island," 2015-2019 *American Community Survey 5-year Estimates*, Table S2502, (accessed Oct. 14, 2021).; U.S. Census Bureau, "Median Household Income for the Past 12 Months (In 2019 Inflation-Adjusted Dollars) By Tenure -- Providence County, Rhode Island," 2015-2019 *American Community Survey 5-year Estimates*, Table B25119, (accessed Oct. 14, 2021).;Seven census tracts in Providence Water's service area were not included in the analysis because they either had 5 or less LSLs in the area or because they were areas whose residential units were comprised mostly of apartment complexes, which are likely not to have LSLs. More information about this is found in Appendix A.

[93] Science Direct, "Pearson Correlation Coefficient," https://www.sciencedirect.com/topics/social-sciences/pearson-correlation-coefficient.

[94] The sample size was too small to make a conclusion about the correlation between median household income and housing units occupied by Native American homeowners. Thus, this "r" value is not included.

[95] U.S. Census Bureau, "Demographic Characteristics for Occupied Housing Units -- Providence County, Rhode Island."; Seven census tracts in Providence Water's Service Area were not included in this analysis. More information about this is found in Appendix A.
[96] HRSA Maternal & Child Health Bureau, "Overview of the State."
[97] U.S. Census Bureau, "Demographic Characteristics for Occupied Housing Units -- Providence County, Rhode Island."; These estimates are based on the subset of census tracts in Providence Water's service area used for the housing unit occupancy data analysis. Seven census tracts in Providence Water's Service Area were not included in this analysis. More information about this is found in Appendix A.
[98] Anonymous, Email communication, (Sept. 29, 2021).
[99] Childhood Lead Action Project. *Notes* at 2.
[100] 40 C.F.R. § 7.35(b).
[101] 40 C.F.R. § 7.35(a)(1)–(3).
[102] EPA External Civil Rights Compliance Office, *Compliance Toolkit: Chapter 1*, at 8 (2017), https://www.epa.gov/sites/production/files/2020-02/documents/toolkit_ecrco_chapter_1-letter-faqs_2017.01.18.pdf.
[103] Baehler et. al., *Full Lead Service Line Replacement: A Case Study of Equity in Environmental Remediation*.
[104] Del Toral et. al., *Detection and Evaluation of Elevated Lead Release from Service Lines*.
[105] *Id.;* EPA staff: Miguel A. Del Toral (retired), Andrea Porter, and Michael R Schock.
[106] *Id.*
[107] EPA Science Advisory Board, *Evaluation of the Effectiveness of Partial Lead Service Line Replacements* at 15.
[108] *Id.* at 5.; Renner, *Lead Exposure Following Partial Service Line Replacement*.
[109] Egan, et al., *Blood Lead Levels in U.S. Children Ages 1-11 Years*.; Yeter, et al., *Disparity in Risk Factor Severity for Early Childhood Blood Lead among Predominantly African-American Black Children*.
[110] Childhood Lead Action Project. *Notes* at 4.
[111] *Id.*
[112] *Id.* at 4 and 5.
[113] Providence Water, *Revised Application* at 9, 13, and 14.
[114] Department of Justice, *DOJ Title VI Legal Manual* VII-17 (2021).
[115] Abt Associates, *Environmental Justice Analysis for the Proposed Lead and Copper Rule Revisions* at iv and 21.
[116] Providence Water, *10-Year 0% Loan Agreements*.
[117] U.S. Census Bureau, "ACS Demographic and Housing Estimates – Providence County, Rhode Island," 2015-2019 American Community Survey 5-year Estimates (ZCTA5 02903; ZCTA5 02904; ZCTA5 02905; ZCTA5 02906; ZCTA5 02907; ZCTA5 02908; ZCTA5 02909; ZCTA5 02910; ZCTA5 02911; ZCTA5 02912; ZCTA5 02919; ZCTA5 02920; ZCTA5 02921), Table DP05 (accessed Dec. 27, 2021), https://data.census.gov/cedsci/table?q=S2502&g=860XX00US02906&tid=ACSST5Y2019.S2502&hidePreview=true.; The Smithfield zip code of 02917 was not included in this analysis because Smithfield was also excluded from the Pearson Correlation demographic analysis. See Appendix A.
[118] U.S. Census Bureau, "Median Income in the Past 12 Months (In 2019 Inflation-Adjusted Dollars) by Tenure," 2015-2019 *American Community Survey 5-year Estimates* (ZCTA5 02906), Table B25119, (accessed Dec. 2, 2021), https://data.census.gov/cedsci/table?g=860XX00US02906&tid=ACSDT5Y2019.B25119.
[119] U.S. Census Bureau, *Quick Facts*, Providence County, Rhode Island, 2015-2019 *American Community Survey 5-year Estimates*, (accessed Dec. 2, 2021), https://www.census.gov/quickfacts/fact/table/providencecountyrhodeisland/INC110219.; This data is at the county level as opposed to Providence Water's service area, specifically, due to census data accessibility limitations for race- and ethnicity-specific income data at the census tract level.
[120] U.S. Census Bureau, "Median Income in the Past 12 Months (In 2019 Inflation-Adjusted Dollars) by Tenure," (ZCTA5 02906).
[121] U.S. Census Bureau, "Demographic Characteristics for Occupied Housing Units," 2015-2019 *American Community Survey 5-year Estimates* (ZCTA5 02906), Table S2502 (accessed Dec. 2, 2021), https://data.census.gov/cedsci/table?q=S2502&g=860XX00US02906&tid=ACSST5Y2019.S2502&hidePreview=true.
[122] 40 C.F.R. § 7.35(a)(1)-(3).
[123] 40 C.F.R. § 7.35(b).
[124] 40 C.F.R. § 7.15.

[125] 40 C.F.R. § 7.25.
[126] *Id.*
[127] Rhode Island Infrastructure Bank, *Annual Report 2015*, 11 (2015), https://www riib.org/node/350.
[128] Rhode Island Infrastructure Bank, *Annual Report 2016*, 15 (2016), https://www riib.org/node/348.
[129] Rhode Island Infrastructure Bank, *Annual Report 2017*, 10 (2017), https://www riib.org/node/346.
[130] Rhode Island Infrastructure Bank, *Annual Report 2018*, 11 (2018), https://www.riib.org/sites/default/files/2018%20Annual%20Report%20Final.pdf.
[131] Rhode Island Infrastructure Bank, *Annual Report 2019*, 11, 18 (2019), https://www.riib.org/sites/default/files/Annual%20Report%202019%20_%20RIIB.pdf.
[132] Rhode Island Infrastructure Bank, *Annual Report 2020*, 9 (2020), https://www.riib.org/sites/default/files/Annual_Report_RIIB_2020.pdf
[133] *Id.*
[134] EPA, *Major EPA Funding for Rhode Island Water Infrastructure Projects Will Help Protect Health and the Environment*, [Press Release], (Oct. 27, 2020), https://www.epa.gov/newsreleases/major-epa-funding-rhode-island-water-infrastructure-projects-will-help-protect-health.
[135] Rhode Island Infrastructure Bank, Rhode Island Department of Health, *State of Rhode Island FY 2022 Intended Use Plan in support of the Federal Fiscal Year 2021 Capitalization Grant*, 7 (2021), https://www.riib.org/sites/default/files/6%2017%2021%20FY%202022%20DW%20Intended%20Use%20Plan%20FINAL_1.pdf.
[136] Rhode Island Infrastructure Bank, *Annual Report 2018* at 6 and 11.
[137] Providence Water, *$3 Million RI Infrastructure Bank Loan Allows Providence Water to Offer 0%, 10-Year Loans for Customers to Replace Private-side Lead Service Lines*, [Press Release], (May 29, 2020), https://www.provwater.com/10yr_0percent_loan.
[138] Providence Water, *Revised Application* at 2.
[139] IRS, "Opportunity Zones Frequently Asked Questions," https://www.irs.gov/credits-deductions/opportunity-zones-frequently-asked-questions#general.
[140] Childhood Lead Action Project. *Notes* at 3.
[141] 40 C.F.R. § 7.25 (emphasis added).
[142] 40 C.F.R. § 7.120(b)(2).
[143] EPA External Civil Rights Compliance Office, *Case Resolution Manual* 8 (2021), https://www.epa.gov/sites/production/files/2021-01/documents/2021.1.5_final_case_resolution_manual_.pdf; *see National R.R. Passenger Corp v. Morgan*, 536 U.S. 101, 115–18 (2002) (holding that alleging any act within the statute of limitations can support liability for all acts related to a Title VII hostile work environment claim, including acts outside of the statute of limitations).
[144] Providence Water, "Providence Water Alerts Customers in Providence and Cranston of Upcoming Water Main Construction Work," (Mar. 31, 2021), https://www.provwater.com/providence-cranston-water-main-work.
[145] Providence Water, *Water Main Rehabilitation Project Overview*.
[146] EPA, Public Comment and Response Document for the Final Lead and Copper Rule Revisions 463 (2020); EPA, *Funding for Lead Service Line Replacement*, https://www.epa.gov/ground-water-and-drinking-water/funding-lead-service-line-replacement.
[147] Shaun A. Goho, Marcello Saenz & Tom Neltner, *Rates Could Fund Lead Pipe Replacement in Critical States: Laws in States with the Most Lead Service Lines Support the Practice* (2019), http://clinics.law harvard.edu/environment/files/2019/04/Rates-Fund-LSL-Replacement-States_Harvard_EDF_2019.pdf.
[148] EPA, Approval of Variance Approval of Variance Decision Pursuant to the Safe Drinking Water Act: Alternative Treatment Technique for National Primary Drinking Water Lead and Copper Regulations for Denver Water (2019).
[149] Anonymous, Email communication, (October 29, 2021).