Massachusetts Department of Environmental Protection - Drinking Water Program

Lead & Copper Rule Survey

11-7-2016

On February 29, 2016, EPA sent a letter to states emphasizing the need to review Lead and Copper Rule (LCR) implementation activities to ensure that state programs are addressing risks to lead in drinking water. Among MassDEP's response actions, the agency developed an informational mailing and online survey for public water suppliers (PWS) subject to the LCR relative to their Lead Service Line (LSL) actions and consumer communications and transparency. A LSL is the water pipe that connects distribution mains to customers. The goal of the survey was to identify technical assistance needs and collect best management practices related to LSL program implementation and consumer communication and transparency. This document summarizes the findings from the survey and will be used to determine LCR technical assistance needs and to develop best management practices for PWS.

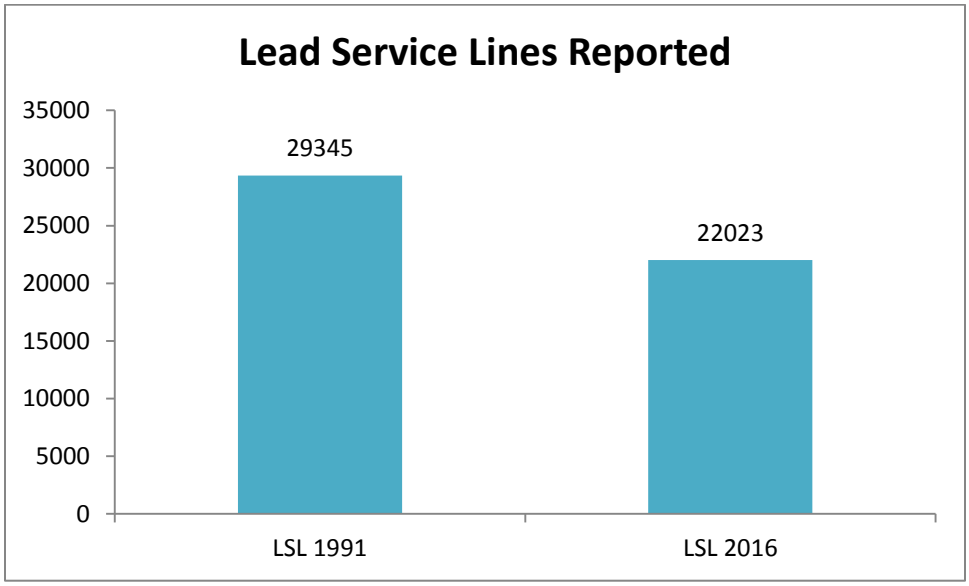
Massachusetts LCR, contained within the Drinking Water Regulations 310 CMR 22.00, includes the following requirements pertaining to LSL:

- All community and non-transient non-community water systems are required to conduct a materials survey; however, a total inventory of LSLs is not required. A materials survey requires that PWS review all records (such as building permits, plumbing permits, maintenance records, etc.) documenting the materials used to construct and repair the distribution system and building connected to the distribution system.
- Systems that fail to meet the lead action level, after installing corrosion control and/or source water treatment, must replace 7 percent of their LSLs each year until the PWS has met the action level for two consecutive monitoring periods.

There are 782 PWS subject to the LCR in Massachusetts, including 523 Community and 259 Non-Transient Non-Community PWS. All 782 PWS were asked to complete the "*Lead and Copper Rule (LCR) Lead Service Line (LSL) Survey.*" As of October 10, 2016 there were 547 responses to the LSL survey (69 percent response rate). The survey is located at surveymonkey.com/r/FMGFBJ2. The following sections summarize the survey questions and responses.

1. Lead Service Lines

Respondents were asked how many LSLs are part of their system. This is a cumulative number for all of the respondents.

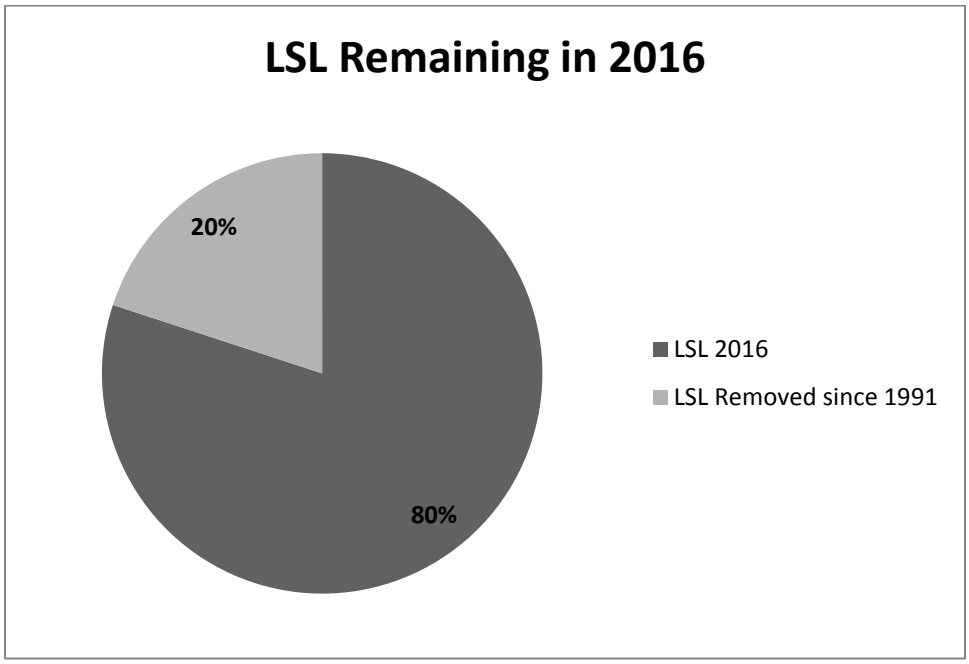


*These results reflect that PWS have not been required to keep an inventory of their lead service lines or goosenecks/pigtails. And, for those that have been inventoried they may be incomplete.

Respondents indicated that there were:

- a total of 29,345 LSLs in 1991, and
- a total of 22,023 LSLs in 2016.

Since 1991, 7,322 LSL have been removed, equivalent to 20 percent of the respondent's known inventory.



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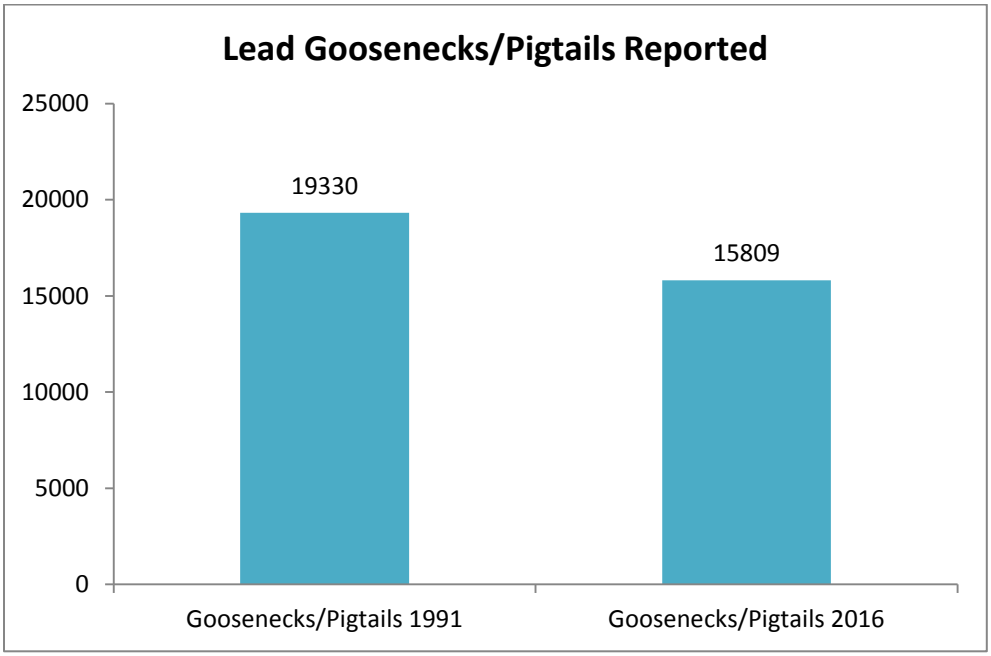
2. Lead Goosenecks/Pigtails

Lead goosenecks/pigtails are short sections of lead pipe used during the early 1900s until World War II to connect a water main in the street to the service line supplying water to a customer. These lead pipe sections were pliable and allowed for a flexible connection between rigid service piping. The bent segments of pipe often took the shape of a goose's neck, and are referred to as "lead goosenecks" or "pigtails." Respondents were asked how many goosenecks/pigtails are part of their system. This is a cumulative number for all of the respondents.



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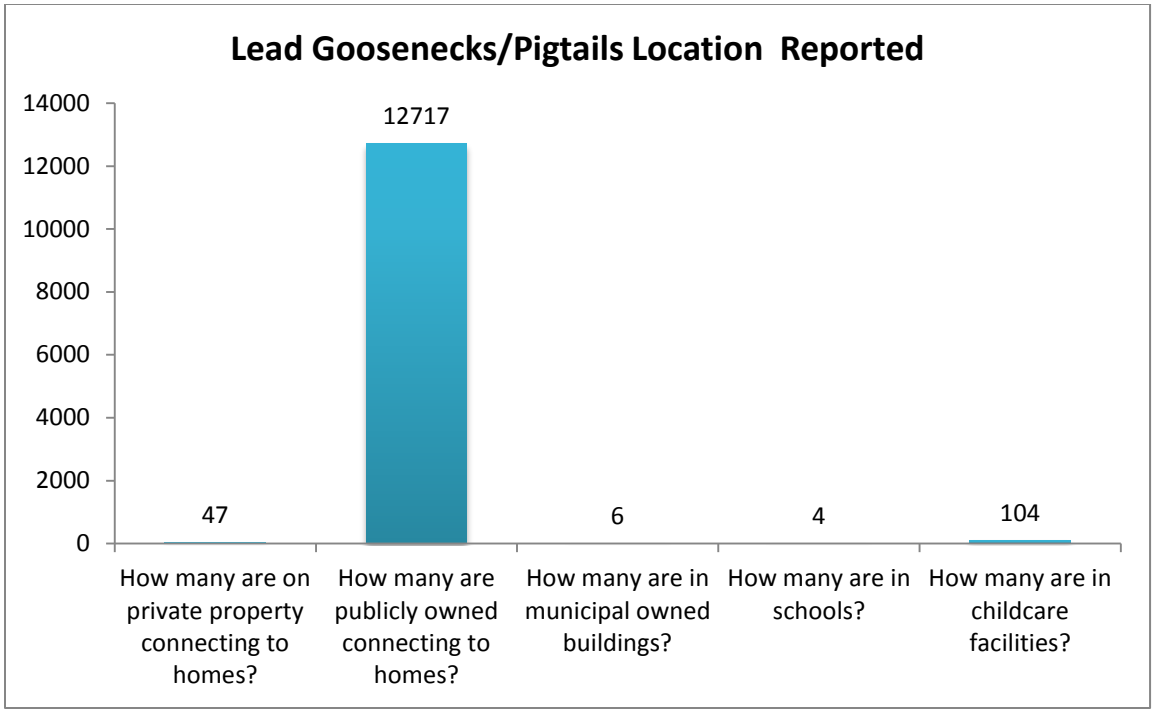
Respondents indicated that there were:

- A total of 19,330 Goosenecks/Pigtails in 1991, and
- A total of 15,809 Goosenecks/Pigtails in 2016.



*These results reflect that PWS have not been required to keep an inventory of their lead service lines or goosenecks/pigtails. And, for those that have been inventoried their inventories may be incomplete.

PWS were asked to identify and characterize the Goosenecks/Pigtails in their systems. The following list represents all known Goosenecks/Pigtails for all respondents:

- 47 Goosenecks/Pigtails are on private property.
- 12,727 Goosenecks/Pigtails are publicly owned, of these, 12,717 are connected to homes.
- 6 Goosenecks/Pigtails are in municipal buildings.
- 5 Goosenecks/Pigtails are in schools.
- 104 Goosenecks/Pigtails are in childcare facilities.
- Other Goosenecks/Pigtails locations represented less than 1percent of the total.

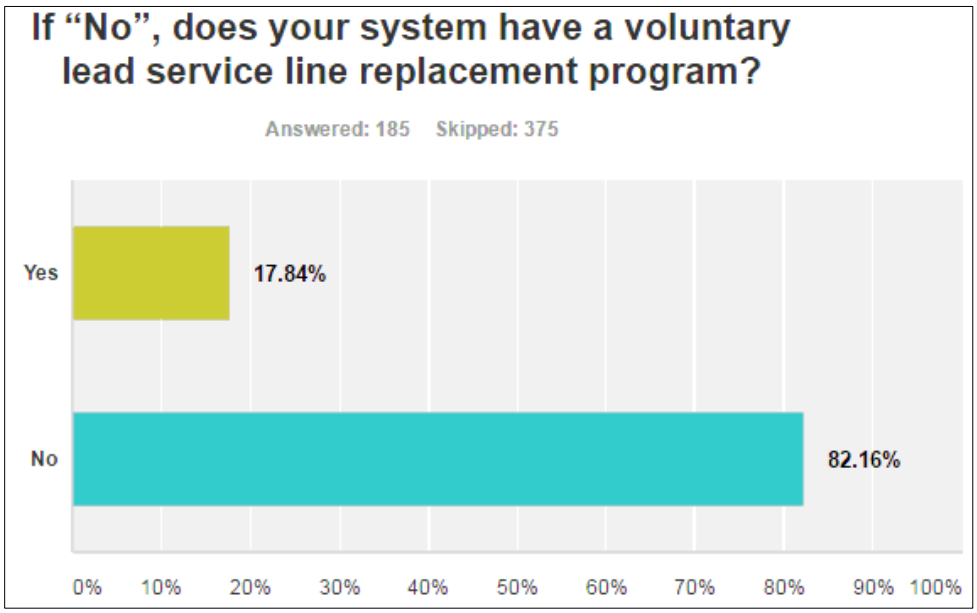
3. Lead Service Line Replacement Program

The following questions were intended to characterize the types of LSL replacement programs in place throughout the state. PWS that exceed the lead action level may be required to implement a LSL replacement program and replace at least seven percent of their identified LSL annually, completing the first seven percent within 12 months of the action level exceedance.

Respondents were asked if they are currently under a mandatory LSL replacement program.

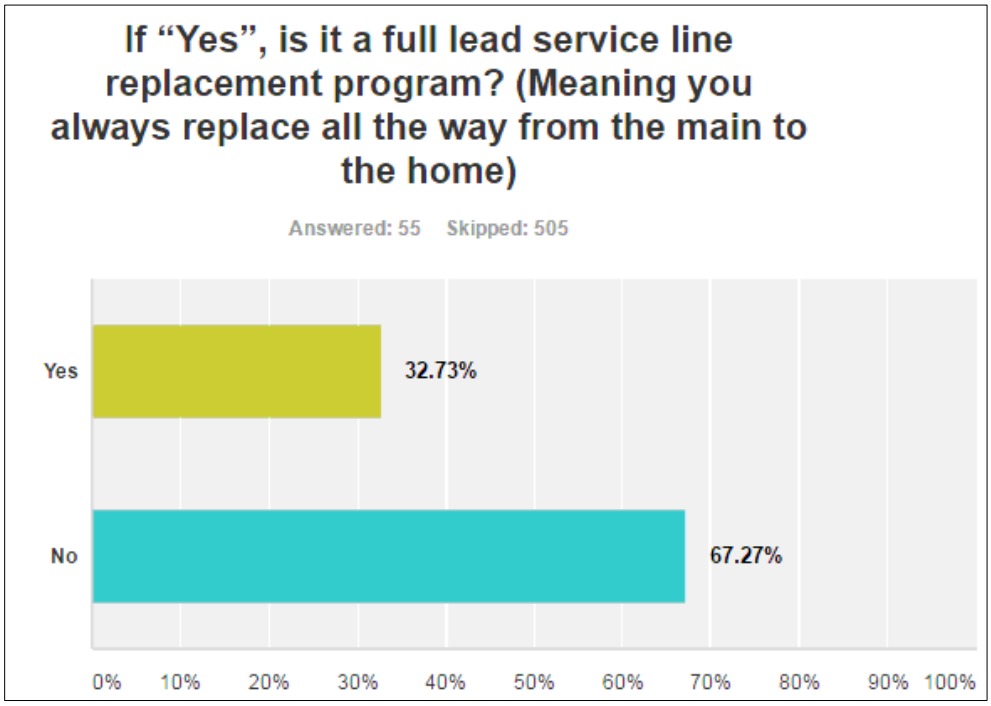
- 95.1 percent responded “No,” their system is not currently under a mandatory LSL replacement program.
- One percent responded “Yes,” they are currently implementing a mandatory LSL replacement program.

Any PWS can implement a voluntary LSL replacement program. Of the respondents that answered “No,” they are not currently implementing a mandatory LSL replacement program, 17.8 percent stated that they have a voluntary program in place.



- Of the 185 respondents to this question, 17.8 percent of responded “Yes,” they do have a voluntary LSL replacement program.
- The remaining 82.1 percent of respondents answered “No,” they do not have a voluntary LSL replacement program.

PWS own service lines from the distribution main to the property line. The remaining portion of the service line is owned by the property owner. The LCR only requires PWS to replace the portion of the service line that the PWS owns, not the entire service line. Many PWS replace, with property owner permission, the entire service line. Respondents were asked if they had a “full” LSL replacement program, in other words, if they replaced the entire service line including the portion privately owned.



- 67.3 percent of respondents answered "No," they do not have a voluntary "full" LSL replacement program.
- 32.7 percent of respondents (18 PWS) answered "Yes," they do have a voluntary "full" LSL replacement program.

4. Replacing Privately Owned LSL

Some municipalities have created LSL replacement incentive programs to provide financial assistance to homeowners looking to replace the privately-owned portion of an LSL. Examples of lead replacement incentive programs are below.

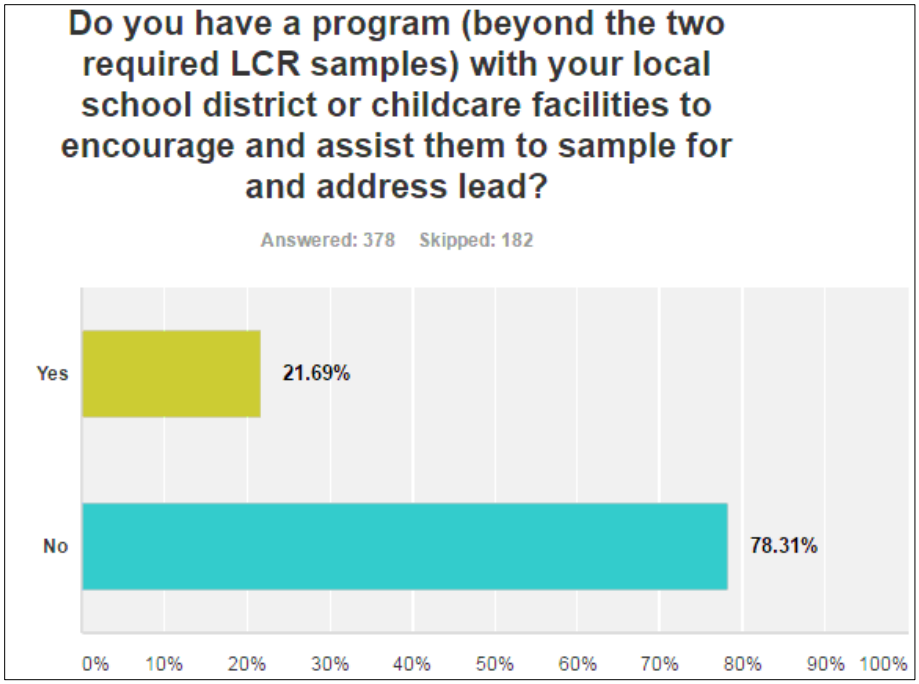
1. Massachusetts Water Resources Authority (MWRA): In 2016, the MWRA announced it is providing $100 million in interest-free loans to its member communities to establish "full" LSL replacement programs. The following are examples of how two MWRA member communities have taken advantage of this funding.
    a. In 2016, Quincy announced their participation in the MWRA program. They intend to borrow an interest free loan of $1.5 million to replace the approximately 141 LSLs remaining in the city including privately owned LSL. See http://www.quincyma.gov/Utilities/alert.cfm?alert_id=868. To see an article on Quincy's LSL replacement project go to: http://www.patriotledger.com/news/20161004/quincy-is-paying-to-replace-privately-owned-lead-water-pipes.
    b. In 2016, Newton announced plans to participate in the MWRA's LSL replacement program and implement a cost sharing program with homeowners for the removal of lead services. The City is reaching out to approximately 641 homeowners where further inspection is needed. See http://www.newtonma.gov/gov/health/public/drinking_water.asp
2. Since before 2016, Boston Water and Sewer Commission has had a cost-sharing program with homeowners for the removal of lead services. The City's Lead Replacement Incentive Program offers eligible property owners a credit of up to $2,000 towards the cost of the LSL replacement. http://www.bwsc.org/SERVICES/Programs/2016_Lead_Brochure.pdf

5. Lead in Schools and Childcare Facilities

The Lead Contamination Control Act (LCCA) was established under the federal Safe Drinking Water Act in 1988 to reduce lead in the drinking water of schools and childcare facilities. All schools (K-12) and Early Education and Childcare Facilities (EECFs) are covered under the LCCA. The LCCA program is a voluntary program, implemented by MassDEP in Massachusetts. As part of LCR, Community PWS are required to take two samples at two schools or EECFs during each sampling period. This sampling is an opportunity for PWS to work with their school districts and EECFs to provide training and education regarding LCCA. Survey respondents were asked if they worked with their local school districts and EECFs to better educate them about LCCA.

- 26.7 percent of respondents said "Yes," they assist with educating and training local school/childcare officials on the Lead Contamination Control Act (LCCA).
- 61.8 percent of the respondents said "No," they do not assist with educating and training local school/childcare officials on the LCCA.

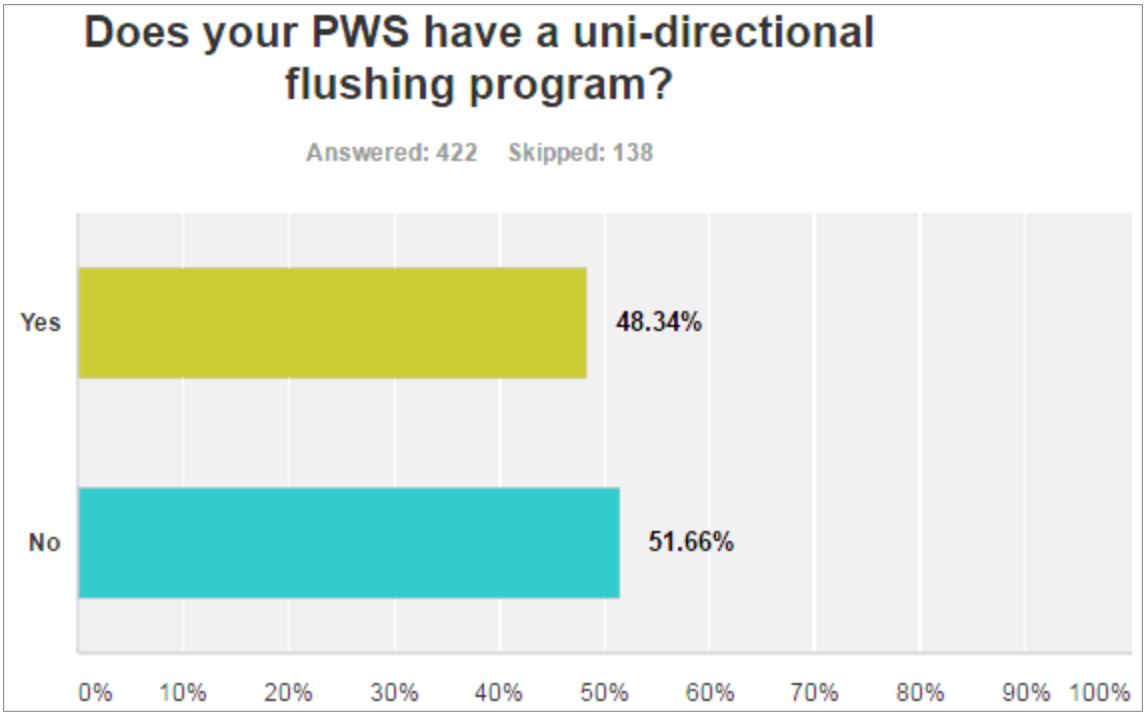
As a follow-up question, respondents were asked if their LCCA program extends beyond the LCR requirements (i.e., do they sample more than two locations at two schools or EECFs each sampling period).



- 21.7 percent of respondents (82 PWS) replied "Yes," their LCCA program goes beyond the two required LCR samples with their local schools and EECFs. The PWS were asked to describe their program; the following are a few examples:
    1. "Free copper & lead testing through a University."
    2. **A.** "Annual spot checks for lead in public schools." **B.** Their certified lab "provides analytical services for lead testing in all facilities." **C.** "School department is currently sampling for lead at all taps."
    3. "Paid for the sampling of all water fountains and sinks in the elementary school, and encouraged the school department to carry a line item in their budget for continued monitoring of the school's drinking water."
- The remaining 78.3 percent of respondents replied "No," they do not have a program that expands beyond the required LCR sampling.

6. Distribution Maintenance-Flushing

Distribution system flushing is a best management practice for maintaining water quality, reducing customer complaints, and enhancing the operation of the distribution system. Uni-directional flushing is promoted as the industry standard for flushing because of its water quality benefits and cost and water savings. There are other flushing techniques that may be easier to implement, but don't have the same long-term water quality and operations benefits. Survey respondents were asked if they implement a uni-directional flushing program.



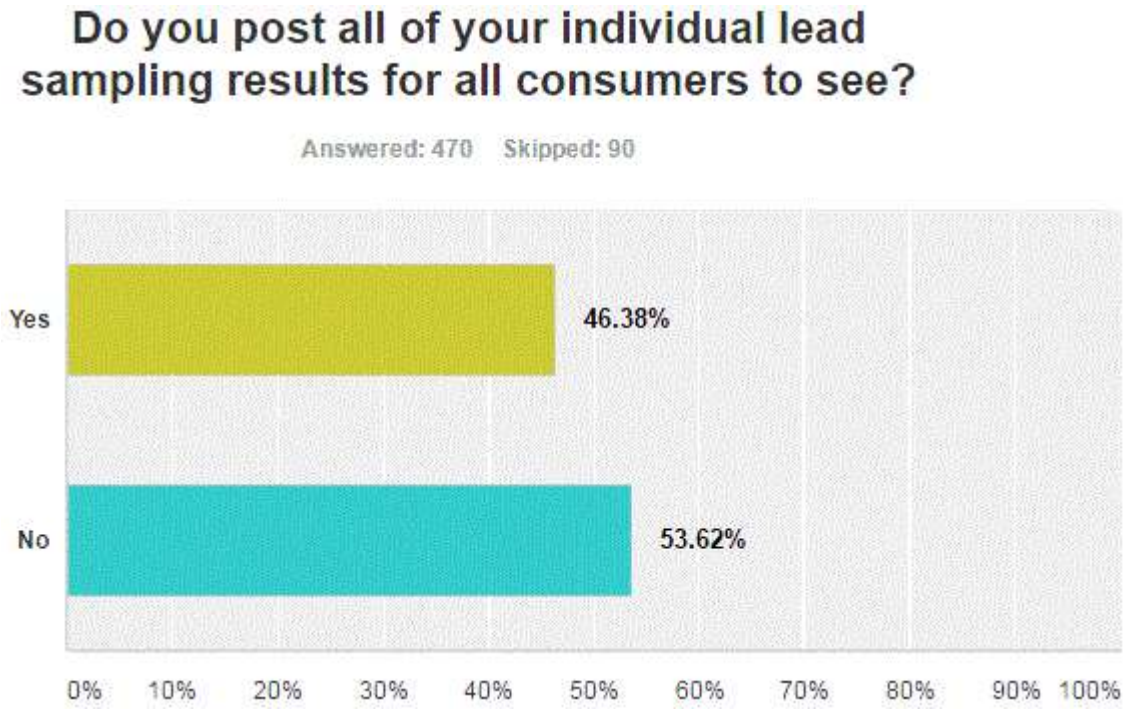
- 48.3 percent of the respondents answered "Yes," they have a uni-directional flushing program.
- 51.7 percent responded "No," they do not have a uni-directional flushing program.
- Examples of PWSs that responded that they implement a uni-directional flushing program characterized their programs as:
    1. "Flushing from tanks to main terminals."
    2. "Computer based model, town separated into four sections, flushing occurs in the spring and fall so the whole town is flushed every two years."
    3. "The plan covers the entire system based on hydrant and valve locations and is designed to maintain a minimum pressure of 20 psi. The system is divided into six flushing zones. Each zone consists of a series of flushing sequences, with each under normal conditions without interrupting supply to customers. Technicians will begin by closing or opening valves as indicated in each sequence. Once the valves are in the indicated positions the hydrant used for that sequence as indicated. Potential low pressure zones are identified. The staff records valves and hydrants used with flow rates and flushing times."

7. Consumer Communication and Transparency

An important component of the LCR is customer notification and public education. PWS are required to provide all homeowners who collected a lead and copper sample with their sample results within 30 days of results being received by the PWS. In addition, if a PWS exceeds the lead action level, they are required to implement a public education program and may be required to implement a LSL replacement program, replacing seven percent of known LSLs annually until the PWS collects two rounds of samples below the lead action level.

PWS are required to provide the individual sample results to MassDEP; this information is used to calculate the 90th percentile results for both lead and copper. The 90th percentile results are currently posted on MassDEP website; however there is no requirement to post the individual sample results that are used to determine the

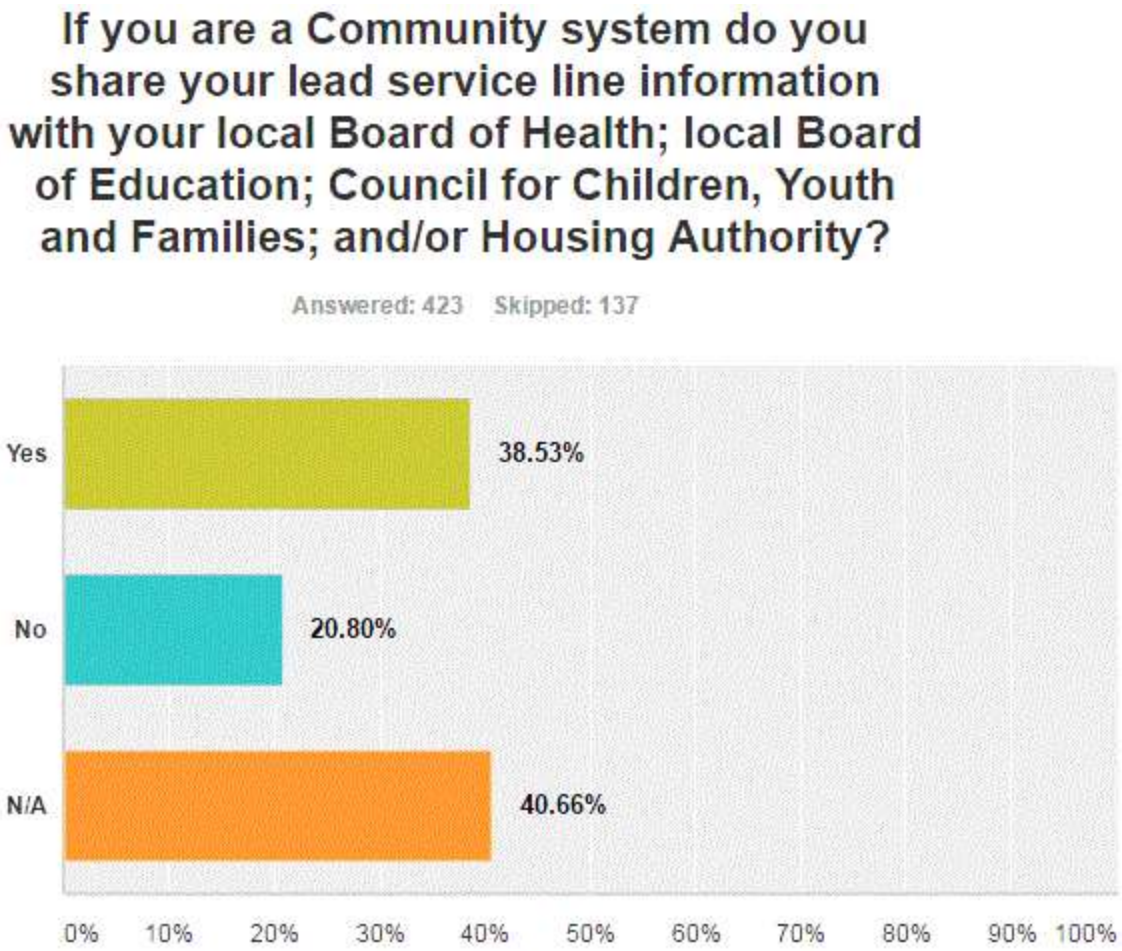
90th percentile. Survey respondents were asked if they voluntarily post all of the individual homeowner sampling results in a place that is publically available.



- 46.4 percent of respondents answered "Yes," they do post all of their individual sampling results for all consumers to see.
- 53.6 percent of respondents answered "No," they do not post all of their individual lead sampling results for all consumers to see.

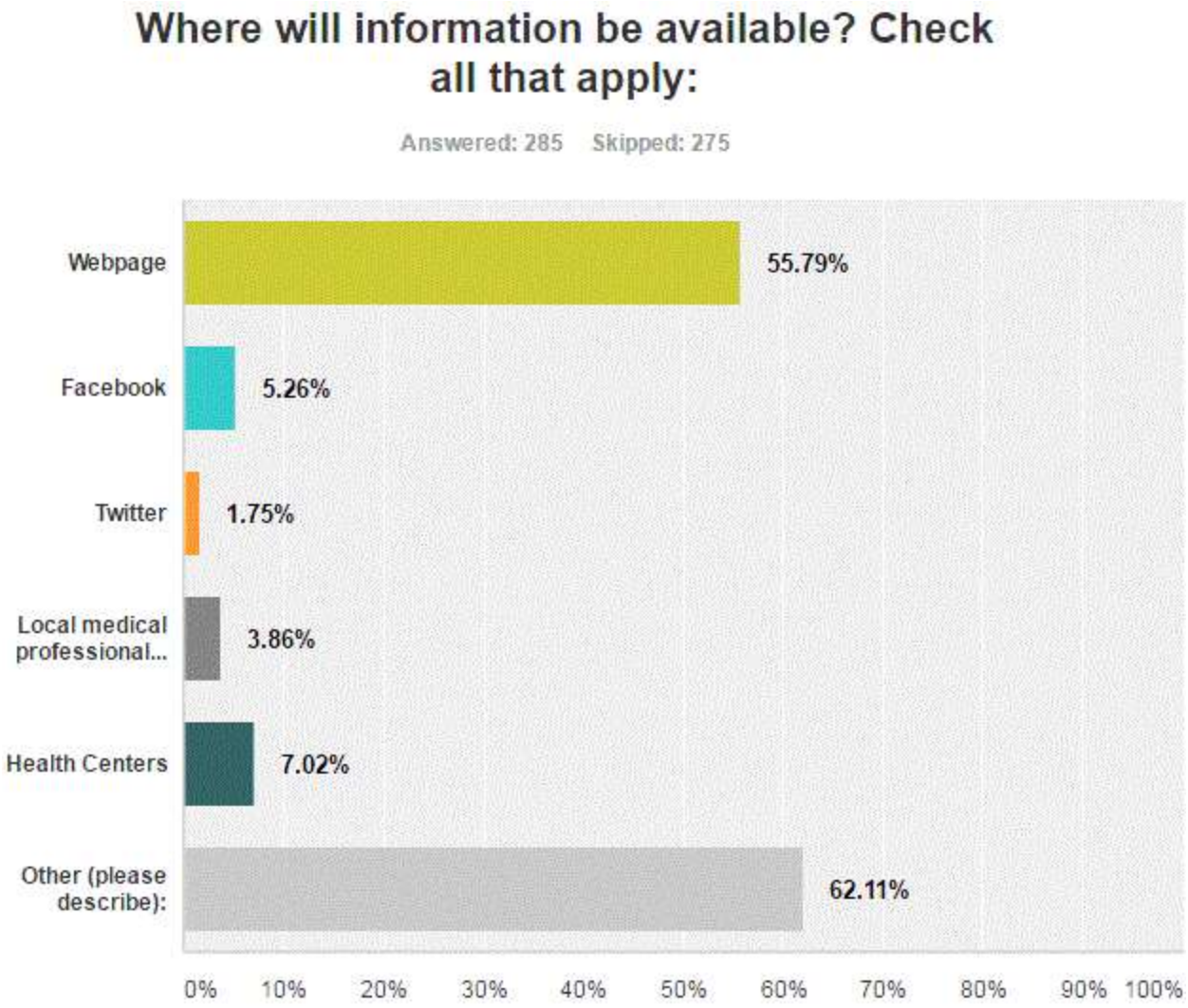
PWS are also required to conduct materials survey of LSL in their system, however this materials survey is not an inventory. Not all homeowners know if they have a LSL; PWS may only sample a subset of their universe of homes with LSL. Many systems are taking the steps to create an inventory of LSLs and to make that information publically available. As with sharing homeowner sampling results with all consumers, sharing the locations of LSL with both partners and customers can enhance the transparency of and cooperation with LSL replacement programs.

Survey respondents were asked if they work with local partners to share LSL location information. These partners include, but are not limited to, the local Boards of Health, local Boards of Education, the Council for Children, Youth and Family Services, and the Housing Authority. These groups can be key partners in helping educate community members about lead in drinking water and can also help encourage community members to replace known LSLs.



- 38.5 percent of respondents answered "Yes," they share their lead service line information with their local Board of Health; local Board of Education; Council for Children, Youth and Families; and/or Housing authority.
- 20.8 percent of respondents answered "No," they do not share their lead information with their local Board of Health; local Board of Education; Council for Children, Youth and Families; and/or Housing authority.

Many PWS are now working to make LSL locations publically available. Survey respondents were asked how they intend to make LSL location information available.



The following list represents how LSL information will be made available:

- The most frequently selected option by respondents (62.1 percent) was "Other." Respondents described "Other" as in the "CCR," "letters to homeowners," and "Town Hall and BOH."
- The "Other" selection was followed closely by "Webpage," 55.8 percent of respondents selected this method of communication.
- A much smaller percentage of respondents intend to provide LSL information using the following methods:
    - Health Centers (7.0 percent of respondents) answered information will be available at Health Centers.
    - Local Medical Professional Offices (3.9 percent of respondents) answered information will be available at local medical professional offices.
    - Facebook (5.3 percent of respondents), and
    - Twitter (1.8 percent of respondents).

Community PWS were asked about their plans to make homeowner sampling data, LSL location information, and other related lead in drinking water information more readily available to the public. The goal of the increased transparency and availability of information is to increase customer awareness about lead in drinking water, helping to increase customer participation in remediation activities. Respondents provided the following information:

1) "The city is in the process of developing an up-to-date database and scan of all water tie card information. This is anticipated to be completed in late 2016 or early 2017. All information will be linked to GIS, and we hope to make an interactive map available online where anyone can look up their service material information."
2) "We notify individuals that draw the lead samples with the results once we receive them. We educate for lead in drinking water though the annual water quality report that we make available to the public."
3) "Information on Town website and /or notification in CCR."

8. Conclusion of Survey Results and MassDEP Follow Up Actions

The LCR regulations do not require PWS to have an inventory or to remove all LSLs and goosenecks/pigtails. The results of the survey and MassDEP records confirm that PWS met the LCR requirement for a material evaluation. The LCR material evaluation is used to generate their required number of sampling sites. Although PWS completed the material evaluation, they do not necessarily have a complete inventory of all LSL or Goosenecks/Pigtails (this is not required by the LCR). Many survey respondents are taking steps to develop LSL inventories, make that information publically available, and to work with homeowners and partners to educate their consumers about lead in drinking water.

MassDEP will be working with PWS to share best management practices, such as financial assistance vehicles for LSL replacement, and technical assistance needs, such as training on uni-directional flushing, identified through this survey. Financing is available for lead service line removal and replacement through the MWRA (for communities served by their system) and through the MassDEP Drinking Water State Revolving Loan Fund (DWSRF). For more information:

MWRA	http://www.mwra.state.ma.us/comsupport/llp/llpprogram.html
MassDEP DWSRF Program	http://www.mass.gov/eea/agencies/massdep/water/grants/drinking-water-state-revolving-fund.html

MassDEP is assisting all PWS with LCR consumer communication and transparency by posting all LCR 90th percentile results on line at http://www.mass.gov/eea/agencies/massdep/water/drinking/public-water-systems-lead-90th-lead-sampling-results.html.

MassDEP Drinking Water Program LCR Contacts		
WERO	Catherine.Wanat@MassMail.State.MA.US	413-755-2216
CERO	Andrea.Lemerise@MassMail.State.MA.US	508-767-2723
NERO	Melissa.Privetera@MassMail.State.MA.US	978-694-3403
SERO	Giliane.Tardieu@MassMail.State.MA.US	508-946-2789
Boston	Program-director-dwp@state.ma.us	617-292-5770

For more information on LCR see http://www.mass.gov/eea/agencies/massdep/water/drinking/lead-and-other-contaminants-in-drinking-water.html#10.