

DENVER WATER LEAD REDUCTION PROGRAM

QUARTERLY REPORT – Q1 2020

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Presented by: Denver Water



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PART 1: INTRODUCTION

As we noted in our March 18, 2020 Notice¹ to the Environmental Protection Agency (EPA) and Colorado Department of Public Health and Environment (CDPHE) describing the impacts of the COVID-19 emergency, Denver Water has taken a number of steps in light of the pandemic. You will see in this report that we are not aware of any impacts the situation has had on the pH/alkalinity adjustment or the Filter Program. Denver Water has, however, taken steps to modify the collection process for Lead and Copper Rule Tap Sampling, the Communications Outreach and Education Program (COE) and the Accelerated Lead Service Line Replacement Program (ALSLR).

Denver Water is committed to significantly reducing the lead exposure levels to customers from lead service lines and plumbing. The Lead Reduction Program provides a holistic and permanent lead reduction approach that will significantly reduce lead exposure to our customers and be less harmful to the environment. In December 2019, Denver Water began the process of implementing the Lead Reduction Program Plan in accordance with the EPA's December 16, 2019 Variance and the November 15, 2019 letter from CDPHE regarding conditional approval of Denver Water's request for modification of optimal corrosion control treatment (OCCT).

This Quarterly Report was prepared in compliance with paragraph 7.B of the Variance and commitments made by Denver Water in the 2019 Lead Reduction Program Plan. The report addresses the first quarter of 2020 for the period of January 1 through March 31, 2020. During this time period, Denver Water has provided three monthly reports for January 2020, February 2020 and March 2020 to CDPHE. This report includes data and information from these monthly reports as well as additional reporting as required by the Variance for the first quarterly report.

What to expect in this first quarterly report with respect to reporting on program activities

The purpose of the quarterly (and subsequent annual) reports is to document the implementation of the Lead Reduction Program, describe the actions taken by Denver Water to reduce lead levels and support the subsequent evaluation of the Lead Reduction Program in anticipation of an extension to the Variance request beyond three years.

The amount of performance data for the different elements of the Lead Reduction Program described in this first quarterly report varies due to the fact that the program is in the process of ramping up activities (see Table 1).

This first quarterly report is organized to address the reporting requirements as if all data are available. A note is included where data gaps exist due to the current implementation phase of the program.

¹ See Appendix REG – 1 Copies of Letters for Compliance-Related Submissions.

TABLE 1. WHAT TO EXPECT IN THE FIRST QUARTERLY REPORT

Paragraph (and LRP Task)	What to Expect in this First Quarterly Report	
7.B.i CCT	This content includes a summary of results provided in the three monthly reports ² previously submitted.	
7.B.ii LSL Inventory	Denver Water published the LSL Inventory on its website on March 5, 2020 ² using data current up to March 3, 2020. Data included in the LSL Inventory described in this quarterly report are current up to March 29, 2020.	
7.B.iii LSL Replacements (aka ALSLR Program)	Denver Water’s own forces have been replacing lead service lines since January 1, 2020. Contractors started replacing lead services on March 5, 2020. Number of Replacements.	
7.B.iv Filters (aka Filter Program)	Filter distribution started on February 12, 2020 with distribution to customers included in the ALSLR Program in year 1. Denver Water initiated broader filter distribution on March 28, 2020 and all 106,000 filters are expected to be distributed by June 24, 2020.	
7.B.v Compliance Metrics	The Equivalency Model will be updated using data collected for the program year and will be presented in the annual report.	
7.B.vi Communications, Outreach and Education	2020 COE Plan. ³ Additional features from the LRPP including Advisory Committee, outreach to 1983-87 homes, etc.	
7.B.vii Health Equity and Environmental Justice	Incorporation of HE&EJ principles into LRP elements. Identification of demographic and socioeconomic data for use in the filter adoption survey. Use of demographic and socioeconomic and other HE&EJ data to create overall risk analysis to prioritize geographical areas for outreach, filter distribution and lead service line replacement. Additional and separate language analysis.	
Additional Requirements and Miscellaneous Deliverables	Summary of other submissions identified in the Variance ² including filter testing before distribution, CCT implementation plan, elevated lead response plan, etc. Summary of other submissions identified in the LRPP, including nitrification control plan, distribution system modeling, etc.	
Appendices	CCT, LSL inventory, water quality results, LSL replacements, customer refusal lists, COE, HE&EJ, maps and summaries to support prioritization of program execution.	
ALSLR = Accelerated Lead Service Line Replacement CCT = Corrosion Control Treatment COE = Communications, Outreach and Education HE&EJ = Health Equity and Environmental Justice		LRPP = Lead Reduction Program Plan LSL = Lead Service Line

² See Appendix REG-1 Copies of Letters for Compliance-Related Submissions.

³ See Appendix COE-C.1 Denver Water LRP 2020 Communications Plan.

PART 2: REQUIRED REPORTING

7.B.i CCT

A combination of water quality parameters and lead sampling results are used to report the performance of Corrosion Control Treatment. Information that was previously reported as part of the Monthly Reports for January, February and March 2020 are not included in this report with the exception of a summary of some of the data.

During this reporting period, Denver Water initiated operations with higher pH and alkalinity in treated water. Denver Water also submitted several miscellaneous reports to CDPHE and EPA as required in the Variance as described in Table 2.

TABLE 2. OVERVIEW OF 7.B.I REQUIREMENTS

Paragraph Reference	Description	Refer to
7.B.i.a	Submit Elevated Lead Response Plan by March 30, 2020 per paragraph 2.B.iv.	Submitted as part of Implementation Plan ⁴ (draft February 11, 2020; re-submitted on March 27, 2020).
7.B.i.b	Notify CDPHE of elevated lead levels and actions taken by Denver Water to reduce lead exposure.	See Table 3 and Appendix ⁵
7.B.i.c	Lead sampling results per the Lead and Copper Rule and from customer requested sampling.	See Table 4 (90 th P to date). See monthly reports ⁴ for January, February and March 2020 submitted previously.
Section III.E (p 70)	Monthly trending of LCR compliance samples and customer requested samples.	See monthly reports ⁴ for January, February and March 2020.
7.B.i.d	CCT parameters for pH and alkalinity, reported monthly.	See Table 5. See monthly reports ⁴ for January, February and March 2020.
Section III.E (p 70)	Install automated pH control loops at all three treatment plants by March 2020.	All active plants have feedback loops in place and functioning. Automated pH control loops are under construction at the Moffat Water Treatment Plant with anticipated availability prior to returning operation in April 2020.
7.B.i.e	All lead and water quality sampling results from investigations for LSLs. All lead and water quality sampling results from post-LSL replacement sampling. Note that lead results from investigations and post-LSL replacement sampling are not included in the calculation of the 90 th percentile lead concentration.	See Table 6 in monthly reports ⁴ for January, February and March 2020. No post-LSL replacement sampling to report.

⁴ See Appendix REG-1 Copies of Letters for Compliance-Related Submissions.

⁵ See Appendix CCT-1 Summary of Response to Elevated Lead Levels.

Paragraph Reference	Description	Refer to
LRPP Executive Summary and Section III.E (p 65)	Targeted communications for 1983-87 homes to self-identify expecting and existing families with formula-fed infants and children up to 2 years of age; offer water quality sampling; provide filter if lead measured > 3 µg/L.	Described with section 7.B.vi.
Section III.E (p 71)	Complete distribution system modeling, evaluating pH, disinfection by-products and water age by January 31, 2020. Submit nitrification control plan by June 30, 2020 to address sampling, monitoring and flushing.	Completed and will be submitted with the nitrification plan by June 30, 2020. To be addressed in Second Quarterly Report.

All lead and water quality samples are managed via Denver Water’s Laboratory Information Management System, with analysis performed by either the Denver Water Quality Lab or a contract lab. The sub-program under which the sample was collected will be reported in LIMS, including Lead and Copper Rule compliance samples, customer requested samples, customer requested samples from homes built 1983-87 (self-identifying as a home with a formula-fed infant), and pre and post-LSL investigative samples.

Denver Water has set the elevated lead investigative response level at 25 µg/L in LCR and customer requested samples. Denver Water provides a description in the monthly report of actions taken when this occurs. Furthermore, Denver Water must promptly notify CDPHE when lead is measured above 150 µg/L in LCR compliance or customer requested samples. There were no results reported above 150 µg/L in customer requested samples during this reporting period.

All samples above 25 µg/L analyzed by month are listed in Table 3; a detailed summary of responses is provided in the March 2020 report for all properties reviewed as part of the elevated lead response plan from January 1 through March 31, 2020. A lead result over 25 µg/L in the first sample bottle for a customer home will trigger investigative sampling, as outlined in the Corrosion Control Treatment Implementation Plan. Lead results over 5 µg/L in the second or third sample bottle will trigger a review of inclusion in the LRP, and the property will be added to the list for LSL replacement and added to the Filter Program if not already listed.

TABLE 3. RESPONSE TO ELEVATED LEAD IN LCR AND CUSTOMER REQUESTED SAMPLES

Description	January 2020	February 2020	March 2020	Response
Number of Properties with Lead > 25 µg/L in <u>any</u> sample bottle	6	5	8	Reported to CDPHE in monthly report (copied in Appendix ⁶).

⁶ See Appendix CCT-1 Summary of Response to Elevated Lead Levels.

Data for LCR compliance and customer requested sampling were provided in the individual monthly reports for January, February and March 2020. The cumulative 90th percentile lead concentration for January 1 through March 31, 2020 is presented in Table 4. Data used to calculate the 90th percentile lead concentration reported in the first and third quarterly reports will align with results reported in Denver Water’s LIMS and may not include all samples collected during this period. Data used to calculate the 90th percentile lead concentration for the second and fourth quarterly reports will align with reporting requirements of the LCR: all samples collected between January 1 and June 30 and between July 1 and December 31 respectively. In response to the COVID-19 emergency, on March 17, 2020 Denver Water staff discontinued collecting samples from inside the homes of customers included in LCR compliance sampling. Consistent with previous years, customers will be asked to collect LCR compliance samples from the tap with video instructions made available in early April.

TABLE 4. SUMMARY OF LEAD AND COPPER RULE COMPLIANCE SAMPLING

Current Cumulative LCR Sampling Results for Lead – Spring 2020 ¹	Result	Number of Homes
Overall 90th Percentile Lead Concentration, to March 31, 2020	13.5	245
Lead Service Line 90th Percentile Lead Concentration	13.6	232
Copper Service Line 90th Percentile Lead Concentration	4.8	13
Percentage of Lead Service Line Homes, Customer Requested Samples + LCR Compliance Samples	95%	
Percentage of Copper Service Line Homes, Customer Requested Samples + LCR Compliance Samples	5%	

1. Includes only those results reported in Denver Water’s LIMS by March 31, 2020.

Chemical feed systems were brought into service for pH and alkalinity adjustment on March 3, 2020 at the Marston and Foothills Water Treatment Plants. Trends for pH and alkalinity are included in the monthly reports since January 1, 2020. The March 2020 Monthly Report includes operating data with adjusted pH and alkalinity. Data for pH in treated water from the active water treatment plants are summarized in Table 5. Data for the distribution system will be included in the Second Quarterly Report once the pH has stabilized in the distribution system. Daily reports will be provided to CDPHE and EPA until equilibrium is established.

TABLE 5. SUMMARY OF WATER QUALITY PARAMETERS¹

Description	pH after March 3, 2020
Target in Water Treatment Plant Effluent	pH ≥ 8.5 required per Variance pH ≥ 8.8 ± 0.1 targeted by Denver Water
Marston Water Treatment Plant Effluent	Minimum daily average = 8.79
Foothills Water Treatment Plant Effluent	Minimum daily average = 8.80
Moffat Water Treatment Plant Effluent	Not in service during March 2020
Distribution System	Not applicable until pH stabilization is achieved

1. See Monthly Reports submitted previously for detailed pH data. Treatment objectives and targets will be added for alkalinity following CCT optimization.

Water quality sampling using the 3-bottle test is performed before LSL replacements or to investigate high lead levels from customer requested and LCR samples. Results can provide an indication of lead, and when reviewed with additional investigation methods, can change the status of the service line (i.e., from possible lead to known lead⁷), inform the LSL Inventory and to schedule ALSLR work.

TABLE 6. SUMMARY OF WATER QUALITY RESULTS TO SUPPORT INVESTIGATION OF SERVICE LINE MATERIAL (PRE-LSL REPLACEMENT) USING THE 3-BOTTLE TEST

Water Quality Sampling for Investigation (pre-LSL Replacement)	Result			Unit
	January 2020	February 2020	March 2020	
Maximum Lead Concentration	346	346	143.8	µg/L
Average Lead Concentration	13.1	9.0	8.2	µg/L
Count of Water Quality 3-Bottle Sampling Kits Analyzed to Support Investigations	41	248	205	Kits

Water quality samples are being offered to all customers following LSL replacement, with sampling kits distributed approximately four months after replacement. There were no post-LSL replacement sampling kits distributed during this reporting period and Table 7 is a placeholder for future reporting periods.

TABLE 7. SUMMARY OF WATER QUALITY RESULTS AFTER LSL REPLACEMENT

Water Quality Sampling after LSL Replacement	Result		
	January 2020	February 2020	March 2020
Total Number of Kits Analyzed to Confirm post-LSL Replacement Water Quality	0	0	0
Number of Properties with Lead > 15 µg/L in 1st Bottle (triggers additional investigation effort)	No samples collected for this reporting period	No samples collected for this reporting period	No samples collected for this reporting period
Number of Properties with Lead > 5 µg/L in the 2nd and/or 3rd Bottle (triggers additional investigation effort)			
Number of Properties with Lead > 5 µg/L in 1st Bottle (triggers customer education)			

⁷ See discussion in Section 7.B.ii LSL Inventory.

7.B.ii LSL Inventory

Denver Water submitted the initial LSL Inventory designating known, suspected, and possible LSLs on February 5, 2020.⁸ On March 5, 2020, Denver Water made public access to the LSL Inventory available on its lead website (<https://www.denverwater.org/your-water/water-quality/lead>). An overview of the LSL Inventory reporting requirements is shown in Table 8.

TABLE 8. OVERVIEW OF 7.B.II REQUIREMENTS

Paragraph Reference	Description	Refer to
3.A	Complete initial LSL Inventory no later than 35 days after the effective date.	Submitted February 5, 2020. ⁸
3.C	Publication of LSL Inventory no later than 70 days after the effective date.	Posted to Denver Water website on March 5, 2020.
7.B.ii.a	Total number of LSLs.	Refer to Table 9. See Appendix. ⁹
7.B.ii.b	Total number of replaced LSLs during the Variance.	Refer to Table 11.
7.B.ii.c	Total number of known, suspected and possible LSLs.	Refer to Table 9.
7.B.ii.d	Total number of unlikely lead.	Refer to Table 9.
7.B.ii.e	Total number of non-lead service lines. Total number of non-lead determined solely by statistical methods.	Refer to Table 9. Described after Table 9.
7.B.ii.f 3.D	Number of investigations that result in a change in the status of the service line in the LSL Inventory (and that are performed independently of a LSL replacement).	Refer to Table 12.
III.B (p 51)	Use results from investigations to update the predictive model which is used to plan and prioritize efforts of the COE Plan, ALSLR Program and Filter Program.	See Section 7.B.vii.
7.B.ii.g	Updated LSL Inventory Map.	https://www.denverwater.org/our-water/water-quality/lead
7.B.ii.h	Rationale for change to status of the service line in the LSL Inventory.	See Appendix ¹⁰ .

Updates were made to the LSL Inventory based upon additional information and further analysis of the data presented in the September 2019 LRPP (see Table 9). The updates resulted in service lines being removed from the LSL Inventory including taps used for irrigation instead of drinking water and taps removed from service due to structures no longer existing or replaced by redevelopments. Adjustments to the status of a service line (i.e., lead or non-lead) were made based on a desk-top assessment completed with individual distributors (total service, read and

⁸ See Appendix REG-1 Copies of Letters for Compliance-Related Submissions.

⁹ See Appendix INV-1 Summary of Service Line Status and p-Value.

¹⁰ See Appendix INV-2 – Line by Line p-Value Changes by Category.

bill, and master meter); potholing results; and water quality sample kit results (confirmation of lead only).

TABLE 9. LEAD SERVICE LINE INVENTORY AS OF MARCH 29, 2020

Status of Service Line	September 6, 2019 Submittal (August 8 Data)	February 5, 2020 Submittal (January 28 Data)	April 10, 2020 Submittal (March 29 Data)
Known Lead	1,066	1,149	1,659
Suspected Lead	61,374	60,549	59,994
Possible Lead	22,106	21,788	20,311
Unlikely Lead	89,388	90,745	89,664
Non-lead	145,766	146,528	145,683
Total Number of Services	319,700	320,759	317,311
TOTAL ESTIMATED Number of Lead Service Lines	63,955	63,195	62,510

The Denver Water map will be updated on the website with the March 29, 2020 LSL Inventory information in April 2020. The LSL Inventory will subsequently be updated on a monthly basis with an updated inventory summary table provided with each quarterly report. The website map will be updated quarterly to reflect changes to the LSL Inventory.

Of the 145,683 service lines identified as non-lead in **Error! Reference source not found.**, 137,972 are included in this category based solely on statistical assumptions¹¹ such as the age of the house, history of development in the Denver Water service area, operating rules requiring copper at post-1971 properties, watermain tap date, etc. Properties built or connected in 1971 or earlier are considered “unlikely lead” based on historical records and evidence of non-lead materials.

Summary of Changes to the LSL Inventory

Between January 28 and March 29, 2020, updates to the LSL Inventory continued as additional data were gathered and reviewed. During this period, 5,318 changes were made to the LSL Inventory of which 1,859 were based on changes to the status of the service line (i.e., p-value).¹² This included changes based on confirmations from Distributors, review of historical data and the removal of 3,459 non-drinking water service lines (i.e., irrigation) as shown in Table 10.

¹¹ This is the number which retains the original number of non-lead properties (p=0) from LRPP Attachment 1 to Appendix III.B.2, Preliminary Identification of Lead Service Lines. Subsequent changes to the LSL Inventory did not result in a change to non-lead (p=0).

¹² See Appendix INV-2 Line by Line p-Value Changes for rationale.

TABLE 10. NUMBER OF PROPERTIES CHANGED IN THE LSL INVENTORY (ALL METHODS)

Description	Count
Total number of properties REMOVED from the inventory¹ as a whole	3,459
Total number of properties for which the service line status CHANGED	5,318
Number of p-value changes	1,859
Number removed from inventory	3,459
Number of properties MOVED into known lead service category	517
Number of properties MOVED into non-lead service category	121
Number of properties REMOVED from suspected lead service category	562
Number of p-value changes	265
Number removed from inventory	297
Number of properties REMOVED from possible lead service category	1,622
Number of p-value changes	1,305
Number removed from inventory	317

1. Irrigation and duplicate taps removed.

Number of LSL Replacements Completed

The total number of lead services lines replaced between January 1 and March 23, 2020 are shown in Table 11. The totals for January and February include Denver Water Transmission and Distribution water main replacement services only as the ALSLR contractors began replacing service lines on March 12, 2020.

TABLE 11. NUMBER OF LSL REPLACEMENTS AS OF MARCH 23, 2020

Description	Count
Number of LSLs Replaced in January 2020	104 ^{1,3}
Number of LSLs Replaced in February 2020	64 ^{1,3}
Number of LSLs Replaced in March 2020	112 ^{2,3}
Total Number of LSLs Replaced First Quarter 2020	280
Total Number of LSLs Replaced in Year 1	280

1. Replacements completed by Denver Water T&D.
2. All by Denver Water's T&D except for 8 by the ALSLR Program.
3. Includes a total of 6 LSL replacements by third parties, from January 1 to March 23, inspected by Denver Water.

Investigations that Resulted in a Change to the Status of a Service Line

Investigations are performed at properties to improve the assumptions that were used to develop the LSL Inventory. A completed investigation at a property may include water quality sampling, potholing and/or visual investigation. After 15 years of the LRP, there should be no remaining properties in the LSL Inventory categorized as suspected or possible LSL and all known LSLs should be replaced.

The number of properties which are investigated and result in a change in status to known lead or non-lead are counted toward the 1.4 percent of the LSL Inventory investigated each year. Investigations as part of the ALSLR Program, such as potholing before replacing a LSL, are not counted toward the 1.4 percent investigations required each year.

A property at which the status (i.e., p-value) of a service line is changed is counted as a completed investigation if all the following conditions apply:

- 1) The property is originally classified as a suspected or possible lead service (see paragraphs 3.B and 3.D in the Variance).
- 2) The investigation was performed independently of LSL replacement and not as part of the 2020 ALSLR Plan (see paragraph 3.D in the Variance).
- 3) The investigation results in a change in status of a service line to either a known (p = 1) or unlikely lead (p = 0.02 to 0.05) or non-lead (p = 0) (see paragraphs 7.B.ii.f and h in the Variance).
- 4) “Investigation(s)” that result in a status change can involve one or more methods to including water quality, pothole, visual inspection, or other methods.

Between January 1 and March 23, 2020, Denver Water performed potholing independently of LSL replacement at 215 properties identified in the LSL Inventory as having a suspected or possible lead service. A three-point verification is used to pothole the status of a service line: from the main to water meter, from the water meter to the building, and inside the building where the service line enters. To confirm “known lead”, lead must be visually confirmed in at least one location and the investigation is considered complete and “counted” for compliance purposes. Potholing on its own is not conclusive for “non-lead” but it can be used to determine a property as “unlikely” to have a lead service (i.e., p-value of 0.02 to 0.05). To confirm “unlikely lead”, there can be no lead or galvanized present in any of the three points used for potholing and there can be no contradiction with the desk-top records review and water quality sampling.

The status of 215 properties was changed from either a suspected or possible LSL to either known lead or unlikely lead service due to potholing as shown in Table 12. This is reflected in the LSL Inventory of the April 10, 2020 submittal in Table 9.

TABLE 12. NUMBER OF INVESTIGATIONS COMPLETED

Number of Properties Investigated	Count
Required Number of Investigations	1,168 (1.4% of all suspected and possible lead services from the September 2019 LSL Inventory)
Number of investigations relying on other methods (i.e., confirmation by distributor or property owner)	To be provided in the second quarterly report
Number of investigations relying on potholing only	215
Number of Investigations Completed in First Quarter	215
Number of Investigations Completed in Year 1	215

7.B.iii LSL Replacements

Replacements conducted as course of construction and service line leaks have been performed since the start of the year and replacements under the Accelerated Lead Service Line Replacement Program started March 5, 2020.

The recent impacts of the COVID-19 outbreak have impacted the ALSLR Program construction schedule. As of March 17, 2020, four of the five contractors working on the ALSLR Program halted interactions at residential properties for the remainder of this reporting period. Denver Water has modified the prioritization of replacements performed by the ALSLR Program to focus on individual task orders for Denver Public Schools, critical customers such as child care facilities and commercial customers that are closed. Planning continues in anticipation of gaining access to residential properties when permitted. Once the threat from COVID-19 declines, Denver Water will re-start the geographic task orders with the intention of increasing the rate of LSL replacement. A re-start date of May 1, 2020 is used for planning purposes.

The ALSLR Program Construction schedule has been reviewed and evaluated to develop a recovery strategy. The recovery strategy evaluated a revised ALSLR Program start date of May 1, 2020 and June 1, 2020, for full implementation of task orders based on a number of factors such as production rates, work days, necessary resources, and concurrent task orders to achieve the regulatory compliance target of 4,477 LSL replacements. The recovery scenarios were completed based on the unknowns related to COVID-19 affects and as COVID-19 requirements evolve, Denver Water has a strategy in place to meet the 4,477 LSL replacements goal. Currently, Denver Water is using a re-start date of May 1, 2020 for planning purposes.

An overview of the LSL line replacement requirements is shown in Table 13.

TABLE 13. OVERVIEW OF 7.B.III REQUIREMENTS

Paragraph Reference	Description	Refer to
4.A	Implement accelerated LSL replacement within 90 days of the effective date.	Contractors were given Notice to Proceed on March 5, 2020.
4.E	Offer post-LSL replacement sampling within six months.	Ongoing (see COE discussion).
7.B.iii.a	Address and date of all replacements.	See Appendix ¹³
7.B.iii.b	Type of replacement.	Table 14.
7.B.iii.c 4.H	Refusal list with premise id and documented attempts for customer contact. Track changes in customer account holders against Service Line Refusal List.	See Appendix. ¹⁴
III.D (p 62)	Provide education and filters to residents of multi-family properties on the Service Line Refusal List	Not applicable for this reporting period.

¹³ See Appendix LSL-2 Addresses and Types of Replacement.

¹⁴ See Appendix LSL-3 LSL Replacement Refusal (Non-Consent) List.

Paragraph Reference	Description	Refer to
7.B.iii.d	Number of properties where an emergency repair was performed using a partial LSL replacement and consent was not granted by the property owner to replace a lead service line in full.	No partial replacements were made this reporting period.
III.D (p 57)	Replace LSL at properties with consistently high lead release and critical care customers.	See Section 7.B.vii for prioritization approach.
III.D (p 58)	Complete approximately 2000 investigations per year in the first five years of the Lead Reduction Program to update the predictive model and improve the quality of information in the LSL Inventory.	See Table 12.
III.D (p 60)	Property owners will be reminded via signage placed at the limits (ends of streets) within geographic work areas four to five weeks in advance of construction.	Planning underway.
III.D (p 60)	Provide flushing instructions following LSL replacement.	Provided to all customers as part of the post-LSL replacement education package. ¹⁵

Number of LSL Replacements Completed during this Reporting Period

Five contractors were qualified to perform LSL replacements prior to January 1, 2020. The ALSLR Contractors received the first wave of geographic task orders with Conditional Notice to Proceed on January 22, 2020. Each task order includes approximately 200 properties. Notifications were mailed to all properties contained in the task order, after which multiple efforts were undertaken to obtain signed consent forms. Reconnaissance or pre-construction meetings were conducted with each property owner to plan the work and schedule for their LSL replacement. On March 5, 2020, Denver Water issued a formal Notice to Proceed to begin the work.

The type of replacements completed between January 1 and March 23, 2020 is summarized in Table 14. A detailed list of the addresses where LSL replacements are completed is maintained¹⁶ by Denver Water.

¹⁵ See Appendix COE-A.20 Flushing Instructions.

¹⁶ See Appendix LSL-2 Addresses and Types of Replacement.

TABLE 14. SUMMARY OF TYPE AND SOURCE OF LSL REPLACEMENT

Type of LSL Replacement January 1 through March 23, 2020	ALSLR Program	Emergency Repairs	Watermain Replacement	Developments and Scrape-offs ¹	Third Parties as Inspected by Denver Water	Total
Full lead	5	53	123	N/A	2	183
Partial lead, such that no lead remains	0	14	66	N/A	4	84
Full galvanized	3	1	0	N/A	0	4
Partial galvanized, such that no lead or galvanized remains	0	6	3	N/A	0	9
TOTAL REPLACEMENTS	8	74	192	N/A	6	280
Emergency repair, partial (i.e., where consent was NOT granted)²	N/A	0	N/A	N/A	N/A	0

1. Data for LSL replacements by developments and scrape-offs will be included in the second quarterly report.
2. No emergency repairs with partial replacements due to NOT granting consent were reported between (January 1 and March 23, 2020).

Customer Consent for LSL Replacement

Denver Water started distribution of notification letters including consent forms on January 21, 2020 to property owners in the initial wave of geographic task orders; the second wave was distributed on February 28, 2020. By March 23, 2020, 59 percent of customers included in the first wave of distribution returned a signed consent form and 44 percent of customers included in the second wave of distribution returned signed consent forms. During this same time period 14 property owners have refused to participate in the ALSLR Program. Consent must be obtained from a property owner before work can start to replace the service line.

A summary of the number of property owners contacted and number of signed consent forms returned is presented in Table 15. A range of outreach methods were used to contact property owners.¹⁷ Denver Water maintains a LSL Refusal List to track attempted contacts at properties where consent to replace the LSL has not been provided as well as an explanation for refusal.¹⁸ At least two attempts at contact by mail plus one attempt at contact in person is made before a property is added to the LSL Refusal List. When a property owner declines to participate Denver Water is committed to continued engagement with the property owner to encourage participation. While the ALSLR crew is an area with active construction activity, the ALSLR crew

¹⁷ See Appendix COE-C.1 Denver Water LRP 2020 Communications Plan.

¹⁸ See Appendix LSL-3 LSL Replacement Refusal (Non-Consent) List including the explanation provided when consent is denied.

may continue to make contact to seek consent from the property owner. Denver Water is committed to follow-up with the property owner at least once a year to encourage participation. Additionally, any change in the water account holder will be used to trigger additional outreach to obtain consent to replace the LSL.

TABLE 15. SUMMARY OF CONSENT AND LSL REFUSAL LIST

Description	Consent Form Signed	Customer Refused
Total Number of Customers Contacted between January 1 and March 23, 2020 = 2,306		
Total Number of Customers who have yet to respond between January 1 and March 23, 2020 = 1,129		
Number of Customers Responding after First Mailed Attempt	734	7
Number of Customers Responding after Second Mailed Attempt	331	4
Number of Customers Responding after In-person Contact	98	3
Total Number of Customers	1,163	14 ¹

1. Number of customers added to LSL Refusal List; Service Point ID shared with COE Team for additional follow-up to understand the reasoning for the refusal and to encourage participation in the ALSLR Program. Explanations for Property Owner refusal are provided in Appendix LSL-3 LSL Refusal List.

7.B.iv Filters

The Filter Program targets properties with known, suspected, and possible LSLs (i.e., with p-values 0.5 and higher). The Filter Program includes the distribution of pitcher filters, on-going outreach and education to encourage pitcher filter use and the distribution of filter replacements. Using the most current LSL Inventory, it is estimated that Filter Program participants consist of 106,000 Denver Water household units, with each household unit receiving a pitcher filter during one of 13 batches of distribution according to the filter prioritization described in Section 7.B.vii. This section summarizes the milestones of the Filter Program to date, including the initial distribution of pitcher filters with a six month supply of replacement filters, filter refusals/opt outs, six month supply of replacement filters distributed post-LSL replacement, filter survey results from the ALSLR Program, household filter sampling, and general address development for COE, ALSLR, and the Filter Program. An overview of the filter reporting requirements is shown in Table 16.

TABLE 16. OVERVIEW OF 7.B.IV REQUIREMENTS

Paragraph Reference	Description	Refer to
5.A	Begin distribution of education materials, filters and replacement cartridges within 90 days of the effective date. Complete distribution of first six monthly supply within 270 days of the effective date.	Distribution began February 12, 2020. See Section 7.B.vi.
5.C	Provide education materials within two weeks of a change in customer account. Provide filters and replacement cartridges within 35 days of a change in customer account.	Not applicable for this reporting period.
5.D	Offer filters to 1983-87 households with formula-fed infants and children under 2 and lead > 3 µg/L in the 1 st L. Develop COE plan to focus on this audience.	Not applicable for this reporting period. See plan in Appendix. ¹⁹
5.E.i	Survey enough customers enrolled in the Filter Program to receive 1,059 responses. Seek approval from CDPHE and EPA for the filter adoption survey questions prior to distribution.	Not applicable for this reporting period. Submitted on February 21, 2020. ²⁰
5.F.i	Confirmation of filter performance before distribution within 90 days of the effective date.	Submitted February 13, 2020. ²⁰
5.F.ii 7.B.iv.f 7.B.iv.g	Confirmation of filter performance in the field (50+ locations included in the LCR compliance sampling). Collect samples using a protocol approved by EPA and CDPHE. Collect additional information regarding the use and operation of the filter.	See Figure 1 and Appendix ²¹ for sample results from February 18 to March 16, 2020. EPA reviewed the protocol as part of the Implementation Plan previously submitted. Included in this section.

¹⁹ See Appendix COE-C.2 LRP 1983-1987 Homes COE Plan.

²⁰ See Appendix See Appendix REG-1 Copies of Letters for Compliance-Related Submissions.

²¹ See Appendix FIL-6 Confirmation of Filter Performance in Field Results.

Paragraph Reference	Description	Refer to
5.G	Document contact to provide lead outreach and education materials to at least 95% of customers enrolled in the Filter Program each year.	See Section 7.B.vi.
7.B.iv.a	Address of all customers enrolled in the Filter Program and provided with filters and cartridges. Certification of number of customers with a known, suspected or possible LSL that use their own filter or bottled water.	See Appendix. ²² Not applicable this reporting period.
7.B.iv.b	Total number of filters and cartridges distributed per year.	See Annual Report.
7.B.iv.c	Percent filter adoption rate per year. Description of method used to determine the filter adoption rate.	See Annual Report.
7.B.iv.d	Maintain list of addresses and Service Point Identification that use a filter or bottled water and any changes to the list.	Not applicable this reporting period.
5.A 7.B.iv.e	Maintain Filter Refusal or Opt-Out List. Maintain list of addresses and SP IDs that have refused enrolment in the Filter Program or opted out.	See Appendix. ²³
7.B.iv.h	Notify CDPHE and EPA within 10 days of receiving sample results indicating measurable lead in filtered samples and provide data for same.	See Figure 1 and Appendix. ²⁴
LRPP Executive Summary (p 9) and III.C (p 56)	If the localized filter adoption rate is less than 75%, additional outreach and education will be provided to that area.	Not applicable for this reporting period
III.C (p 55)	Survey filter use as part of ALSLR Program following LSL replacement.	Refer to summary paragraph in this section and Appendix. ²⁵

Filter Distribution

Denver Water distributed pitcher filters using a multi-phase approach. Denver Water initially distributed pitcher filters for ALSLR waves 1 and 2 and 120WaterAudit subsequently distributed the first batch. Initially, ZeroWater filter kits were packaged in the Denver Water warehouse and shipped from the United States Postal Service on February 12, 2020 with a five to eight business day shipping period. Beginning on March 27, 120WaterAudit packaged and shipped Brita filter kits to the local Denver USPS hub. Filter kits arrived at households between March 28 and March 31, 2020. By the end of this first reporting period, 3,635 pitcher filters and a six-month supply of replacement filters were distributed to 3,635 households (see Tables 17 and

²² See Appendix FIL-1 Filter Delivery Addresses.

²³ See Appendix FIL-3 Filter Program Refusals.

²⁴ See Appendix FIL-6 Confirmation of Filter Performance in Field Results.

²⁵ See Appendix FIL-5 Filter Adoption Survey Results.

18). One household declined to accept the filter kit provided by Denver water – this was not due to use of either their own NSF-certified filter or bottled water.

TABLE 17. SUMMARY OF FILTER DISTRIBUTION

Description	Count	Comment
Number of households provided with a filter kit between January 1 and March 31, 2020	3,635	See Appendix. ²⁶
Number of households that use their own NSF-certified filter or bottled water	-	Not applicable for this reporting period.
Number of households that decline to use a filter or bottled water	1	See Appendix. ²⁷

TABLE 18. SUMMARY OF SIX MONTH SUPPLY OF FILTERS DISTRIBUTED POST LSL REPLACEMENT

Description	Count ¹	Comment
Number of households provided with six month supply of filter replacement post lead service line replacement between January 1 and March 23, 2020	280	See Appendix. ²⁸

¹ This applies to LSL replacements performed by Denver Water and the ALSLR crews between January 1 and March 23, 2020.

Additional details related to filter kit distribution are provided in the Appendices:

- List of premise addresses that have returned filter kits to sender.²⁹ This is a list of 29 returns from the ZeroWater filter kits that were shipped on February 12. In follow-up, some were confirmed to be a vacant property.
- List of premise address for all households where filter kits were provided.²⁶ As the first batch of filter kits from 120WaterAudit began arriving on March 28, returned filter kits will be updated in the next quarterly report for this batch.
- List of premise address and SP IDs for all households who refuse to join Denver Water’s Filter Program and for whom it has been certified that the household is using their own filter (NSF-certified to remove lead) or bottled water (not applicable this reporting period).
- List of premise address for all households that opt out or refuse to participate in the Filter Program.²⁷

Denver Water will describe efforts taken to encourage households to opt into the Filter Program in future quarterly reports.

²⁶ See Appendix FIL-1 Filter Delivery Addresses.

²⁷ See Appendix FIL-3 Filter Program Refusals.

²⁸ See Appendix FIL-2 Distribution of Post Lead Service Line Replacement 6 Month Cartridge Replacement Supply.

²⁹ See Appendix FIL-4 Filter Program Pitcher Returns

Verifying Mailing Addresses for Filter Distribution

Denver Water used a systematic approach to first identify addresses and subsequently vet addresses used in the Filter Program. This approach used the following techniques:

- Access multiple databases to generate an address list for all residential, commercial, multifamily, irrigation properties, etc.
- Review addresses with Distributors (total service, read and bill, and master meter).
- Apply the United States Postal Service validation process known as the Coding Accuracy Support System.
- Track mail returned to sender and notifications of address change by households.

The success of the Filter Program depends on Denver Water's ability to make contact with those households with a known, suspected or possible LSLs. A detailed description of the process used by Denver Water is described in the text box below.

Summary of Process to Vet Addresses Included in Filter Program

The source of address information used by the Filter Program included:

- Denver Water Customer Care and Billing Database to identify all customers (residential, commercial, multifamily, irrigation, etc.).
- Additional databases, aerial maps, and online photograph reviews were used to identify multi-family residential properties with more than five units and multi-unit commercial addresses not included in CC&B information AND/OR reconciled with CC&B data.
- Confirmation by distributors (total service, read and bill, and master meter) via in-person meetings to review addresses included in the LSL Inventory.
- Physically visiting properties to determine addresses for multi-unit properties such as apartments, mobile home parks, and office complexes.

Two types of addresses were used for the distribution of pitcher filters, filter replacements and related education materials:

- Premise Address in CC&B: The physical location to which pitcher filters, filter replacements and education materials were mailed. This includes a mailing address of the physical property regardless of whether the resident owns, rents, etc.
- Mailing Address in CC&B: The mailing address to which Denver Water mails bills. This may be the same as the premise address for residential properties, a PO Box if requested by a customer, a property management company address, or an owner's address for rental properties (if different than the premise address). The mailing address is used for education material distribution in addition to premise address as this is the address representing owners, property management companies, etc.

Denver Water used the following steps to confirm that the premise addresses and mailing addresses used by the Filter Program were correct:

- Comparison to available CC&B information.
- Checked using the USPS validation process. The Coding Accuracy Support System was applied to all addresses to confirm accuracy, including multi-family and multi-unit commercial addresses

identified by Denver Water and not included in CC&B. This was repeated as addresses were added to the LSL Inventory.

- Manual updates to address list in response to identified changes and customer notifications with subsequent validation using the USPS CASS.
- Documentation of any returned mail with corrections made to the address list.

The Final Address List was generated following a review for potential duplications to reduce the likelihood of sending more than one package of education materials and/or pitcher filter and filter replacements to the same address.

Ongoing efforts to update the address list include tracking returned mail on a weekly basis in the Program Database and validating any updates using the USPS CASS.

Filter Adoption Survey and Results

The questionnaire for the Filter Adoption Survey has been finalized and provided to EPA for the purpose of providing public notice under the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. It is anticipated that federal approval of the questionnaire will be provided in August 2020. There will therefore be no reporting for filter adoption rate until the fourth quarter.

Informal surveys have been performed by ALSLR field crews during pre-construction meetings asking customers about filter adoption and use. Between January 1 and March 31, pre-construction meetings were conducted at properties included in the 2020 ALSLR Plan. Of these, 190 responses to inquiries made during the pre-construction meeting were captured in the LRP database.³⁰ With this small dataset, 190 survey results have been received, which accounts for 4% of the total customers who will have their LSLs replaced in 2020. These results show that the majority of customers are using filtered or bottled water for drinking, cooking and infant formula:

- Customers at 190 locations participated in the filter adoption survey informally conducted during pre-construction meetings and before their LSL was replaced.
- Of these, the majority of customers responded that they used filtered or bottled water for drinking (162) and cooking (134).
- All households with a formula-fed infant indicated that they used filtered water when preparing formula.

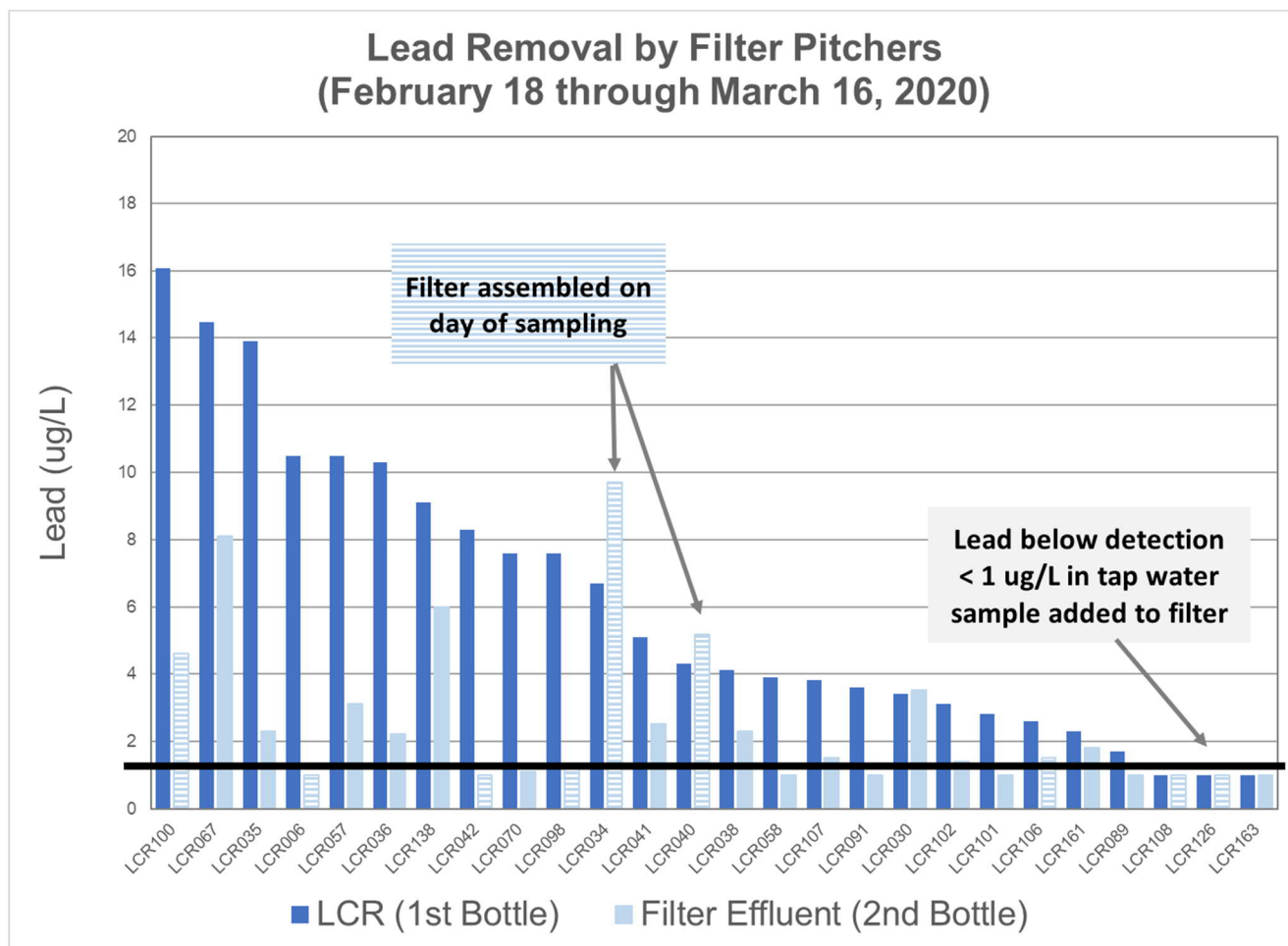
Confirmation of Filter Performance and Usage in the Field

Field sampling is conducted by Denver Water in conjunction with LCR compliance sampling (see section 7.B.i). Only data included in LIMS between January 1 and March 31, 2020 are included in this reporting period. The field filter sampling protocol uses the 1st L bottle for LCR compliance sampling and the second or “intermediate” bottle to supply the pitcher filter and generate a filtered water sample. It is noted that the lead measured in the 1st L is only an approximation of the lead available in the 2nd L that is used to fill the pitcher filter. As a result,

³⁰ See Appendix FIL-5 Filter Adoption Survey Results.

lead removal through the pitcher filter is only an approximation (see Figure 1). In some homes the lead concentration in the 1st 1 L sample can be higher than in the 2nd or intermediate sample, or vice versa. The analytical error for lead was calculated by Denver Water to be within ± 2.8 percent.

FIGURE 1. RESULTS FROM FILTER TESTING IN THE FIELD



Note: When calculating the percentage lead removal, a value of 0.5 $\mu\text{g/L}$ is used for results measured below the detection limit of 1.0 $\mu\text{g/L}$.

As part of sample collection at the 26 properties included in this reporting period, Denver Water staff observed the following:

- The pitcher filter was still in the box or had not been used at nine households prior to Denver Water’s visit to collect the sample; Denver Water staff assembled the pitcher filter when this was the case.
- Mixed performance was observed for the just-assembled filters: two pitcher filters showed higher lead levels and seven pitcher filters performed as well as the conditioned filters.

- Some households asked about or used their own filter (four properties); samples were collected from the Denver Water provided pitcher filter even in cases where the household was using a filter provided by the household.
- Lead was measured at or below the detection limit of 1 µg/L at nine households.

After collecting 26 samples, in-home sample collection by Denver Water staff has been temporarily suspended as part of Denver Water's COVID-19 response. Pitcher filter sampling will continue in April to collect the balance of the 50 samples that must be collected by June 30, 2020 and customers are being asked to collect the pitcher filter samples in addition to the LCR compliance samples.

7.B.v Compliance Metrics per Paragraphs 2.C, 3.D, 4.I, 5.G and 6.B

A summary of the performance metrics that will ultimately be used to evaluate the overall performance of the LRP is presented in Table 19.

TABLE 19. SUMMARY OF COMPLIANCE

Paragraph	Description	Comment
2.C	<p>C. Corrosion Control Treatment Metric. Denver Water must consistently <u>maintain in all parts of the System a minimum target pH of 8.5 during the first year of operation under this Variance.</u></p> <p>In the future, Denver Water must maintain pH and alkalinity within the ranges designated by CDPHE in its modification decision under Section 11.26(3)(d)(ii) of 5 CCR 1002-11.</p>	See Section 7.B.i
3.D	<p>D. LSL Inventory Compliance Metric. Denver Water <u>must investigate a minimum of 1.4% of the total estimated number of suspected and possible LSLs</u> in the LSL Inventory each Program Year (based on a subset of Y as described in paragraph 3.A above), as adjusted.</p> <p>These investigations are performed independently of the LSL replacements.</p>	See Section 7.B.ii
4.I	<p>I. Accelerated LSL Replacement Compliance Metric. Denver Water <u>must annually achieve at least a 7.0% cumulative average Program Year LSL replacement rate</u> as determined based on reporting required in paragraph 7.B.</p>	See Section 7.B.iii
5.G	<p>G. Filter Communication Compliance Metric. Denver Water <u>must make direct contact with lead outreach and education materials to 95% of all customers enrolled in the Filter Program</u> in every Program Year. . . . Compliance shall be documented by mailing lists and mail receipts, lists of customer email addresses for customers who elect to receive email communication, or other forms of documentation approved by CDPHE.</p>	See Section 7.B.vi
6.B	<p>B. Comprehensive LRPP Performance Metric. Denver Water must demonstrate to EPA's satisfaction, using the updated equivalency model results as reported under paragraph 7.C, that the <u>combined actual performance of the LRPP as implemented continues to be "at least as efficient as" orthophosphate treatment in reducing lead exposure</u> on an annual basis. Denver Water may account for the CCT optimization period in this demonstration.</p>	To be provided in Annual Report for Year 1

7.B.vi Communications, Outreach and Education

The 2020 COE Plan describes goals, desired outcomes, target audiences, strategies and sequencing of tactics³¹. COE efforts specific to each program element are also included in those element sections of this report and reporting requirements are identified in Table 20.

TABLE 20. OVERVIEW OF 7.B.VI REQUIREMENTS

Paragraph Reference	Description	Refer to
7.B.vi	2020 COE Plan	See Appendix. ³¹
7.B.vi.a	Description of COE activities conducted. Copy of materials.	Discussed in this section. See Appendix for copies of materials included. ³²
7.B.vi.b	Ambassador Program Overview.	Discussed in this section. See Appendix. ³³
7.B.vi.c	COE Plan for 1983-87 homes to self-identify formula-fed infants and children under 2 years.	Discussed in this section. See Appendix. ³⁴
III.E	Targeted messaging to homes with copper piping and lead solder to flush the tap after periods of non-use.	Incorporated into COE materials included in Appendices. ³¹
8.G	Notify customers enrolled in Filter Program of LRP and launch multi-media campaign.	Multi-media campaign launched March 23, 2020. ³⁵

The following highlights COE program activities carried out during the first quarter of the program year, organized by strategy type:

Owned Media

- Developed and distributed letter for commercial customers in January 2020 to notify them of the pH adjustment and potential impacts.
- Developed materials for communications to accompany water quality kits sent to households identified for early 2020 LSL replacements, distributed in January 2020.
- Developed bill insert and story to be included in *WaterNews*, a brochure mailed to all billed customers, sharing information about the program and pH adjustment. The bill insert and *WaterNews* story were distributed to all billed customers

³¹ See Appendix COE-C.1 Denver Water LRP 2020 Communications Plan.

³² See Appendices COE-A and COE-B.

³³ See Appendix COE-C.3 Ambassador Program Overview.

³⁴

See Appendix COE-C.2 LRP 1983-1987 Homes COE Plan.

³⁵ See Appendix REG-1 Copies of Letters for Compliance-Related Submissions.

beginning in February 2020. A second *WaterNews* story was also distributed in March 2020.

- Developed and then began distribution of the LRP introductory booklet on March 18, 2020, to introduce households enrolled in the Filter Program to the overall LRP.
- Developed filter kit box design and insert materials, which began distribution on March 30, 2020.
- Developed materials for communications to households around LSL replacement, including an initial process overview and notification letter, consent form, acceptance form, a second notification letter and customized flushing instructions for post-replacement. Tailored versions were produced for those households identified for LSL replacement in early 2020, which began distribution in February 2020, and those identified for replacement beyond early 2020, which began distribution in March 2020.
- Developed filter postcard to remind households in the Filter Program that they should have received a pitcher filter and of proper filter use, to be distributed beginning in April 2020.
- Developed content for the filter adoption survey, currently in review with the Colorado Department of Public Health and Environment and to be distributed beginning in fall 2020.

Earned Media

- Generated significant digital, print and broadcast news coverage on the LRP and pH adjustment, including 9News (NBC), CBS4, Denver7 (KMGH), The Denver Post, Westword, Denverite, Univision, the Stapleton Front Porch, 630KHOW, KNUS, KOA and more.

Digital Communications

- Distributed email on February 20, 2020, to database of 6,693 customers who have opted in for program updates, reminding them of the upcoming launch of the program and gathering additional demographic information to inform future communications.
- Posted stories on denverwaterTAP.org on February 28, 2020, and March 9, 2020, to overview the program and highlight upcoming pH changes. Stories were also emailed to 4,266 TAP subscribers. The “New Lead Reduction Program underway” TAP story was also published in Spanish on March 18, 2020.
- Launched comprehensive digital presence for the LRP at denverwater.org/Lead on March 5, 2020. The website shares program information, including ALSLR, Filter, Lead Service Line Inventory and Corrosion Control Treatment elements, and

provides stakeholders with the opportunity to register for program updates and to communicate with a LRP representative by phone and email.

- Launched pH-specific webpage, denverwater.org/pH, as part of the larger launch of comprehensive LRP information on March 5, 2020.
- Published interactive, searchable map of the Lead Service Line Inventory on March 5, 2020, and trained call center staff to address customer questions.
- Made 14 posts on the LRP on Denver Water-owned social media channels.

Grassroots/Grasstops

- Met one-on-one with commercial customers, including the Denver Zoo, the Downtown Aquarium, Denver Parks & Recreation and the Denver Botanic Gardens in January and February 2020 to share information about the LRP and pH adjustment.
- Coordinated with DaVita, Denver International Airport, Associated Landscape Contractors of Colorado, Brewers Guild, Distillers Guild, Colorado State University Extension for Denver County, trade technicians regarding both boiler and HVAC management, fish stores and recycled water customers in January and February 2020 to share information on pH in their respective industries.
- Began development of the Ambassador Program³⁶ through identification of more than 1,000 paid, stipend and information-sharing partners. Scopes of Work and contracts are in progress for two paid community partners. Communications strategies have been developed to activate information-sharing partners beginning in April 2020.
- Utilized the LRP prioritization model to identify tiered priorities for neighborhood, community and business outreach, which includes a visual presentation to provide an overview of the program with neighborhood-specific information (as appropriate). Developed the 2020 presentation and began scheduling presentations for early-mid 2020. Presentations that were previously confirmed and listed below that have been canceled as a result of the COVID-19 pandemic include:
 - Globeville First (March 16).
 - INC (InterNeighborhood Cooperation Parks and Open Spaces) (March 17).
 - Elyria Swansea/Globeville Business Association (March 19).
 - Cole Neighborhood Association (April 9).
 - Baker Historic Neighborhood Association (April 14).
 - Clayton United (April 14).
 - West Washington Park Neighborhood Association (April 21).

³⁶ See Appendix COE-C.3 Ambassador Program Overview.

- DRCOG Citizen’s Academy (May 7).
- Held multiple meetings with potential partner agencies, such as the Special Supplemental Nutrition Program for Women, Infants and Children and Colorado Child and Adult Care Food Program to identify areas for collaboration in sharing information on the LRP, filter use and 1983-87 homes. A meeting with Denver Public Schools is in the works pending rescheduling due to the COVID-19 pandemic.
- Identified business and civic-oriented organizations to use their influence as community leaders to encourage program participation, including the following categories:
 - Chambers of commerce.
 - Business districts.
 - Rotaries.
- Presented the LRP at the Denver Office of Strategic Partnerships, EPA, Energy Outreach Colorado’s 2nd Annual Save Green Be Green event (March 10).
- Identified organizations to include on the LRP Advisory Committee, including meeting structure, timing and agenda topics. In light of the COVID-19 pandemic, the first meeting, a chartering session, will be held virtually and is tentatively scheduled for early May 2020. Invitations are expected to be distributed in early April.

Internal Communications and Coordination

- Conducted 10 internal trainings for various Denver Water divisions including: Customer Relations (customer care, water sales and customer service field), Administrative Services, Water Distribution, Distribution Inspections and Emergency Services.
- Conducted a half-day training with ALSLR contractor teams on February 19, 2020, with an emphasis on COE to support positive customer engagement and multicultural perspectives.
- Developed talking points for call center management to use in preparing staff to respond to customer inquiries. Talking points are updated and added to on a weekly basis.

Government Relations

- Held 89 briefings with local government officials, including the City and County of Denver’s Mayor’s Office, to share program information and plans for ALSLR and Filter Program work. Discussions included updates regarding the LRP, community outreach and HE&EJ considerations with a focus on ways to partner to advance HE&EJ principles.

Distributors

- Provided LRP updates at distributors' forum meetings in January and February 2020. The March meeting was cancelled due to the COVID-19 pandemic.
- Published LRP update in monthly distributor newsletter in January, February and March 2020.
- Worked with distributors to identify a single distributor representative to serve on the LRP Advisory Committee.
- Developed tiered options for collaborating with distributors around household notification. There are three options that include: Denver Water engaging directly with distributor households; distributors using Denver Water materials to engage with their households; and developing co-branded materials that distributors will use to engage with their households. Outreach to distributor households is scheduled to begin in April 2020.
- Met with 24 districts individually to discuss their district's suspected lead service line inventory. During the meetings, tiered options for household outreach were discussed.

The program also developed a COE plan³⁷ for 1983-1987 homes, with messaging and content development in progress.

Outcomes of COE activities carried out during the first quarter of the program year:

- Denver Water contacted 3% of customers enrolled in the Filter Program by March 31, 2020. The remaining enrolled customers will be contacted early in the second quarter of 2020. More details and mailing lists specific to this effort are included in the Filter Program section of this report.
- 4,391 visitors to the program website since the launch of comprehensive LRP information on March 5, 2020.
- 1,989 views of TAP stories published through March 29, 2020.
- 108,568 individuals reached through social media activity through March 31, 2020.
- 24 mentions of the LRP in media stories, with an aggregate readership of 73,646,850.
- Copies of outreach materials are provided in Appendices.³⁸

As Denver Water implements its 2020 COE Plan and conducts additional outreach surrounding ALSLR and Filter Programs, those efforts will be detailed within the specific program section of subsequent quarterly reports.

³⁷ See Appendix LRP COE-C.2 1983-1987 Homes COE Plan.

³⁸ See Appendices COE-A and COE-B.

7.B.vii Health Equity and Environmental Justice

Health equity and environmental justice principles have been integrated into every aspect of the LRP, including COE activities. This commitment created a holistic mindset that allowed HE&EJ principles to shape when and how Denver Water invited and involved community members to the program.

HE&EJ principles used in the LRP are as follows:

- All people should have the opportunity to attain their full health potential regardless of income, education, age, disability, sexual orientation, gender identity, race or ethnic background, or geographic location.
- Conditions in the environments in which people are born, live, learn, work, play and age affect a wide range of health and quality-of-life outcomes and risks. These factors are known as social determinants of health.
- To achieve equity and justice, societal structural inequities (attitudes, policies and practices that create or reinforce patterns of inequity in communities) must be addressed.
- No group of people should bear a disproportionate share of the adverse environmental consequences of industrial, governmental and commercial operations or policies.
- People should have access to information and an adequate opportunity to participate in decisions about activities that may affect their environment and/or health. Meaningful decisions are made with the participation of affected citizens.
- While equal treatment of all people is often viewed as the goal, to address health equity and environmental justice, all people must be treated equitably. Equitable treatment means the conscious and deliberate investment of additional resources to populations experiencing inequity.

In order to best address these principles in the elements of the LRP, Denver Water utilized two key tools which serve as a foundation for program work. The first is a predictive model, which serves as a basis for methodology for targeting specific neighborhoods, cohorts and non-English speaking groups in ALSLR and Filter Program planning and activities. The LRP predictive model utilizes several datasets, including CDPHE's Women, Infants and Children dataset as well as socioeconomic, language and demographic factors. Details on how the predictive model has been used to inform program activities are described in this section³⁹.

The second is a language analysis of the Denver metro area, which produced insights influencing translation, interpretation, community partnering strategies and outreach efforts. In this analysis, Denver Water used data from multiple sources to evaluate languages spoken in neighborhoods across the City and County of Denver, as well as the city as a whole. This allowed the team to identify the top 10 languages spoken across the City and County of Denver:

³⁹ See Appendix HEJ-1 ALSLR Prioritization and Appendix HEJ-2 Filter Distribution Prioritization.

- English.
- Spanish.
- Arabic.
- French.
- Russian.
- Amharic.
- Vietnamese.
- Chinese.
- Somali.
- Nepali.

Denver Water utilized the language analysis data along with Denver Water property data detailing the likelihood of a LSL to determine the percentage of households reached based on language. The analysis shows that 95.5% of households across the City and County of Denver are reached with bilingual (English/Spanish) materials/outreach. Following English and Spanish, Arabic is the third most common language in the area. Details on how these insights from the language analysis were used to inform program activities is described in this section.⁴⁰

An overview of HE&EJ reporting requirements is presented in Table 21.

TABLE 21. OVERVIEW OF 7.B.VII REQUIREMENTS

Paragraph Reference	Description	Refer to
7.B.vii V (p 77)	Summary of activities conducted and designed to address HE&EJ principles.	Discussed in this section. See LRPP (p 77).
7.B.vii.a	Description of how HE&EJ principles were incorporated into the implementation of the: <ul style="list-style-type: none"> • ALSLR Program. • Filter Program. • COE Plan. 	Discussed in this section. See Appendices. ^{41, 42}
7.B.vii.b	Socioeconomic and demographic data collected through the filter adoption survey.	Annual Report.
7.B.vii.c	Documentation that outreach and education materials have been provided to at least 95% of households enrolled in the Filter Program.	See Section 7.B.vi.a. See Appendix. ⁴³
V (p 77)	Commitment to continue to consult and collaborate with the organizations and HE&EJ experts, stakeholders, community members and customers to continually improve upon integration of the HE&EJ principles with the Lead Reduction Program	Annual Report.
V (p 79)	Collaborate with other agencies to address lead exposure from all sources	Annual Report

⁴⁰ See Appendix COE-C.3 Ambassador Program Overview.

⁴¹

See Appendix HEJ-1 ALSLR Prioritization and Appendix HEJ-2 Filter Distribution Prioritization

⁴² See Appendix COE-C.1 Denver Water LRP 2020 Communications Plan.

⁴³ See Appendix FIL-1 Filter Delivery Addresses.

The following section describes how HE&EJ principles were used to inform Denver Water’s COE approach to promote its LRP during the first quarter of the year, organized by program component:

Incorporating HE&EJ Principles via Communications, Outreach and Education

To ensure HE&EJ principles are at the forefront of our communications, outreach and education efforts for the LRP, Denver Water utilized CDPHE’s HE&EJ principles as the foundation for all HE&EJ work. This approach positions Denver Water to overcome potential barriers to establishing awareness, understanding and behavior change among these important populations.

- Communities were prioritized using the LRP prioritization model to focus COE efforts in 2020. Because all customers enrolled in the LRP are also included in the Filter Program, this analysis used the model’s filter distribution risk score for each census block to prioritize areas for program-wide outreach. Priority communities for COE activities, influencing all efforts described below, are any census blocks that ranked in the middle or higher range of the risk scores. Additional details are included in the “HE&EJ Principles Applied to the Filter Program” section below.⁴⁴
- As part of the Ambassador Program,⁴⁵ Denver Water utilized HE&EJ principles to prioritize key community partners (paid, stipend-funded and information-sharing partners) to help engage HE&EJ identified customers. Paid partners — CREA Results and iNow, a program within the Trailhead Institute — were specifically selected because of their ability to engage HE&EJ identified communities. CREA Results, a community organization that specializes in the Latinx community, will conduct community outreach to encourage participation in the ALSLR and Filter Programs. iNow, formerly the Colorado African Organization, is a community organization that specializes in supporting immigrant populations from Africa and Asia. Through its community navigators, iNow will conduct one-on-one and community outreach to encourage participation in the ALSLR and Filter Programs.
- Denver Water has identified 130 community organizations in or near prioritized communities to serve as stipend and/or information-sharing partners to distribute program materials and information in English and Spanish. Examples of partner categories include:
 - Afterschool programs.
 - Birth centers.
 - Childcare centers.
 - Community centers.
 - Faith organizations.
 - Healthcare clinics.

⁴⁴ See Appendix HEJ-2 Filter Distribution Prioritization.

⁴⁵ See Appendix COE-C.3 Ambassador Program Overview.

- Hospitals.
- Preschools.
- Insights from Denver Water’s language analysis will serve as a guide for Denver Water and partners identified through the Ambassador Program⁴⁶ to support greater access to information and engagement with the LRP. Program informational materials will be offered in both English and Spanish. Outreach will be conducted in multiple languages in a variety of communities.
- Arabic is the third most spoken language across the City and County of Denver. Beginning in the second quarter of 2020, Denver Water will be providing a select number of program materials in Arabic as well as interpretation services to reach as many customers as possible. Materials translated into Arabic include the LRP overview booklet, consent form, flushing instructions and sources of lead in drinking water infographic. Additional materials, such as the acceptance form, are also planned for translation.
- Consultants with iNow, a program of the Trailhead Institute (a paid partner), maintains a staff member base of community navigators who are originally from a variety of African and Asian countries. These staff will conduct outreach in Arabic (and additional languages) using translated materials provided by Denver Water.
- Denver Water invited customers to sign up for updates about the LRP through email updates. Customers who opted-in to receive updates were asked to provide additional information on their language preference(s) to inform future communications needs.
- Per Denver Water’s commitment to provide bilingual materials, Denver Water has continued to post program materials in Spanish on its website, developed and provided hard copies of its program materials in Spanish for the overall LRP, ALSLR and Filter Programs (see Appendices⁴⁷ for copies of program materials).
- Informational videos are being created in Spanish and will be posted on Denver Water’s website. This will expand Denver Water’s reach and accessibility to and for households about proper pitcher filter use, LSL replacements, and how lead gets into water. Three videos are currently available in English.⁴⁸

⁴⁶ See Appendix COE-C.3 Ambassador Program Overview.

⁴⁷ See Appendices COE-A and COE-B.

⁴⁸ See Appendix COE-B.6 Videos, including i) Lead in water and Denver Water’s Lead Reduction Program overview, ii) How does lead get into water? and iii) Simple steps to minimize the risk of lead in your water.

HE&EJ Principles Applied to ALSLR Program

Denver Water developed and delivered a multicultural training program⁴⁹ for ALSLR field observers and contractors on February 19, 2020. The training program included the following topics:

- Denver Water customer journey.
- Implicit bias training.
- Self-awareness and working across cultures.
- Working with those when English is not a first language and protocol for interpretation.
- Managing behaviors when working in the public sector (in the field and in homes).
- Key program messages.
- Review of materials customers receive.

Denver Water also Developed an Early Childhood Development Service Providers COE plan⁵⁰ to address the special considerations that public/private schools, afterschool programs and childcare facilities pose as they move through the LRP, including the ALSLR Program.

Results from the predictive model were used with demographic and socioeconomic data to identify neighborhoods (aligned with census tracts) to prioritize LSL replacements⁵¹. A comprehensive list of geographic areas and individual properties with a high risk of lead exposure was generated; a focused, targeted list for the 2020 ALSLR Plan was generated by integrating information about other construction projects (including paving) to identify synergies. Based on this analysis, communities were prioritized for further HE&EJ outreach. This analysis will be completed annually to guide the planning of LSL replacements.

HE&EJ Principles Applied to Filter Program

The risk analysis developed in support of the prioritization of the 2020 ALSLR Plan was updated to include CDPHE's Women, Infants and Children dataset as well as HE&EJ factors describing income and minority considerations.

The more than 106,000 addresses targeted for filter distribution were divided into 13 areas in the Denver Water service areas. The estimated risk scores of each of the 13 areas were compared and areas of comparable risk were grouped and then the logistics for delivery by truck were considered. A final evaluation was completed to check for opportunities to distribute filters to adjacent residential areas of high risk at the same time. This was undertaken with the goal of lessening potential confusion from households from adjacent or nearby streets wondering when they will get their filter.

⁴⁹ See Appendix COE-C.5 COE Section of Field Observer Training Manual.

⁵⁰ See Appendix COE-C.4 LRP Early Childhood Development COE Plan.

⁵¹ See Appendix HEJ-1 ALSLR Prioritization.

The first two batches of filters were distributed to all properties expected to be included in the early months of the 2020 ALSLR Program (i.e., ALSLR waves 1 and 2) and properties that will have their service lines replaced as part of watermain replacement projects planned by Denver Water in 2020. Filters for households identified for later phases of LSL replacement began receiving filters in March 2020.

Because all households enrolled in the LRP are also included in the Filter Program, Denver Water used the filter distribution risk scores from the prioritization model to prioritize all neighborhoods for ongoing, program-wide COE efforts to share information about the LRP, filter use and LSL replacements. The following prioritization categories reflect the results⁵² of this analysis:

- Priority 1: Census blocks that include a filter distribution risk score of ≥ 0.8 and areas identified for 2020 LSL replacements.
- Priority 2: Census blocks adjacent to active construction or filter distribution risk areas with a filter distribution risk score of ≥ 0.5 .
- Priority 3: Remaining census blocks with customers enrolled in the LRP.

⁵² See Appendix HEJ-2 Filter Distribution Prioritization.