

DENVER WATER LEAD REDUCTION PROGRAM

LEARNING BY DOING – 2022

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Presented by: Denver Water



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LIST OF ACRONYMS

ALSLR	Accelerated Lead Service Line Replacement
CDPHE	Colorado Department of Public Health and Environment
COE	Communications, Outreach and Education
EPA	Environmental Protection Agency
LBD	Learning by Doing
LRP	Lead Reduction Program
LRPP	Lead Reduction Program Plan
LSL	Lead Service Line
OCCT	Optimized Corrosion Control Treatment
Order	Variance Order

INTRODUCTION AND RATIONALE

Denver Water is committed to significantly reducing the lead exposure levels to customers from lead service lines and plumbing. The Lead Reduction Program (LRP) provides a holistic and permanent lead reduction approach that will significantly reduce lead exposure to our customers and be less harmful to the environment. Implementation of the Lead Reduction Program Plan (LRPP) in accordance with the EPA's Dec. 16, 2019, Variance Order regarding Denver Water's request for modification of optimal corrosion control treatment (OCCT) began in December 2019. As of Jan. 1, 2023, Denver Water's LRP is implemented under the Dec. 1, 2022, Variance Order (Order) and will submit an updated LRPP amendment by July 1, 2023.

The Lead Reduction Program (LRP) includes six elements:

- Corrosion control treatment.
- Lead service line (LSL) Inventory.
- Accelerated Lead Service Line Replacement (ALSLR) Program.
- Filter Program.
- Communications, Outreach and Education (COE).
- Learning by Doing.

Five of the six elements are used to evaluate the overall effectiveness of the program and those results are presented in the separate report submitted to CDPHE and EPA (see Annual Report for 2022). Quantitative performance metrics were not identified in the Order for the LRP's sixth element, Learning by Doing.

The following commitments have been made as part of the Learning by Doing element of the LRP:

- Establish a Stakeholder Advisory Committee to provide input on efficient and effective ways to implement the LRP and achieve the goals of the Order.
- Evaluate the performance of the LRP to improve outcomes.

The Learning by Doing element is incorporated to improve outcomes during the life of the LRP.

METHODOLOGY

The Learning by Doing element uses data in recurring cycles of collective inquiry and action to achieve improved LRP results. The process used in the Learning by Doing approach involves the following steps:

- 1) Gather evidence of current results and collaboratively evaluate with stakeholders.
- 2) Develop strategies and ideas to build on strengths and improve results in challenging areas.
- 3) Implement the strategies and ideas.
- 4) Analyze the impact of the changes to discover what was effective and what was not.
- 5) Apply new knowledge in the next cycle of continuous improvement.

A Learning by Doing Log is maintained to document the performance of the LRP and identify efficient and effective ways to implement the program. The approach requires collection and logging of data followed by review of which aspects of the program are working or need refinement.

External stakeholders are used to apply the Learning by Doing process programmatically via the LRP Stakeholder Advisory Committee.

The outcomes tracked in the Learning by Doing Log and the activities of the Stakeholder Advisory Committee are presented in this document as a supplement to the Annual Report for 2022. Preliminary Learning by Doing ideas were presented in the semi-annual and annual reports. Efforts continue to use the Learning by Doing approach to address challenges and improve the effectiveness of the LRP.

STAKEHOLDER ADVISORY COMMITTEE

The LRP Stakeholder Advisory Committee was launched in 2020 to serve as a sounding board and critical conduit of information between the broader community and the LRP. The committee is composed of members from health care organizations, government agencies, civic groups and utility partners who assist in sharing information with their communities and also provide key insights into external communications and engagement strategies to support the success of the LRP.

A list of 2022 committee members was included in the First Semi-Annual Report for 2022. The Stakeholder Advisory Committee was convened quarterly in 2022. An outline of meeting dates, primary topics and outcomes is shown in Table 1.

TABLE 1. SUMMARY OF 2022 STAKEHOLDER ADVISORY COMMITTEE MEETING TOPICS

Meeting Date	Primary Topics	Outcomes and LRP Modifications
Jan. 20, 2022	<ul style="list-style-type: none"> • Overview of LRP progress in 2021. • Overview of lessons learned in 2021 and resulting program modifications. 	Discussion on cases where homeowners refuse service line replacement confirmed committee support for Denver Water’s current approach, along with consideration for future shifts in approach as the program evolves.

Meeting Date	Primary Topics	Outcomes and LRP Modifications
	<ul style="list-style-type: none"> • Overview of the need for a new Variance for the program starting in 2023. • Overview of potential federal funding opportunity and Denver Water's next steps. 	<p>Following the meeting, a survey was created and sent to committee members to gather feedback on how to best engage with the group both in and out of meetings.</p>
April 21, 2022	<ul style="list-style-type: none"> • Review committee member survey results. • Update on LRP progress since start of 2022. • Update on the Variance extension request process. • Update on pursuit of federal funding. • Discussion on increasing return rates for post-replacement water quality test kits. 	<p>Feedback from the group supported Denver Water's proposed approach to increase water quality test kit return rates, including entering customers who return kits into a random gift card drawing. The gift card drawing was launched in May.</p> <p>Survey results revealed that the committee would value an opportunity to meet face-to-face, which was subsequently scheduled for the third quarter. The group also expressed a desire for more updates in-between meetings. In response, updates were sent throughout the remainder of the year to share upcoming community meeting and engagement opportunities, progress on the Variance extension request process and federal funding request, and when the monthly public dashboard had been posted.</p>
July 20, 2022	<ul style="list-style-type: none"> • Tour of Denver Water Operations Complex. • Update on LRP progress through mid-year 2022. • Overview of 2022 filter adoption survey results. • Update on the Variance extension request process. • Update on the pursuit of federal funding. 	<p>Committee members noted that the in-person meeting opportunity was incredibly valuable. In response, Denver Water is planning at least one in-person committee meeting a year.</p>
Oct. 12, 2022	<ul style="list-style-type: none"> • Update on LRP progress through late 2022. • Update on the pursuit of federal funding, including stakeholder and community input. • Update on the Variance extension request process, including recommended updates to program requirements and metrics. • Sneak peak of 2023 work and program activities. 	<p>Committee members asked questions on the messaging around federal funding (such as the association with Denver Water rates). Denver Water took these questions into consideration as messaging around the award of funding was refined.</p>

In 2023, the goal for the Stakeholder Advisory Committee is to meet again quarterly for a total of four meetings with at least one meeting held in-person. The makeup of the committee is expected to remain the same, with the potential addition of new organizations as appropriate.

EXAMPLES OF LEARNING BY DOING

Examples from Learning by Doing are organized by LRP element with examples related to health equity and environmental justice identified separately. Each Learning by Doing example is presented by title, by the type of desired impact, and a description of the issue and opportunity for learning or change. As shown in Table 2, 12 examples of Learning by Doing are included in this submission in addition to the examples included in the First Semi-Annual Report and Annual Report for 2022.¹ The 12 examples address improvements related to improving the customer experience, protecting public health and/or improving the efficiency of the LRP.

TABLE 2. OVERVIEW OF LEARNING BY DOING EXAMPLES

LRP Element	Number	Description	Desired Impact
Corrosion Control Treatment	LBD-1	Sending water quality kits to Denver Water employees periodically to QA all aspects of customer sampling.	Improve customer experience.
	LBD-2	Sending monthly distribution lists to 120Water and CAL to provide the latest customer contact information.	Improve program efficiency.
	LBD-3	Mailing water quality sampling request letters to customers included in the investigation task order to reduce the number of unused water quality kits.	Improve program efficiency.
LSL Inventory	LBD-4	Developing a data dictionary to allow customers to use their address for online inquiries.	Improve customer experience. Improve program efficiency.
	LBD-5	Requesting interior inspections on a case-by-case basis to ease scheduling and improve efficiency of field work.	Improve program efficiency.
ALSLR Program	LBD-6	Providing "Leave Behind Checklist" to customer prior to replacement to outline key milestones, construction details and what to expect.	Improve customer experience.
	LBD-7	Developing tap and meter decisions matrix for contractors to use for common tap and meter questions.	Improve customer experience. Improve program efficiency.
Filter Program	LBD-8	Organizing filter cartridge replacements by ZIP code to reduce impacts of USPS delivery delays and to meet the six-month replacement cartridge requirement.	Protect public health.

¹ See First Semi-Annual Report for 2022 submitted on July 8, 2022, and the Annual Report for 2022 submitted on Feb. 10, 2023.

LRP Element	Number	Description	Desired Impact
Communications, Outreach and Education	LBD-9	Expanding use of reminder emails to customers to improve consent form return.	Improve customer experience. Improve program efficiency.
	LBD-10	Developing online consent and filter request forms to expand digital, self-serve options for customers.	Improve customer experience.
Health Equity and Environmental Justice	LBD-11	Curating Spanish-speaking community outreach to address feedback from community.	Improve customer experience.
	LBD-12	Providing program information in additional languages to expand support and program accessibility.	Improve customer experience.

Corrosion Control Treatment

LBD-1: Sending water quality kits to Denver Water employees periodically to QA all aspects of customer sampling.

Water quality kits are sent to customers by 120Water and, in addition to the collection bottles, include informational inserts with instructions on sampling their water properly. The informational inserts are crucial in explaining how the water is to be sampled correctly to result in accurate lab results. In 2022, one water quality kit was sent to a Denver Water employee for a QA check and multiple issues were identified with both the informational inserts and the shipping box’s taped seal. To prevent issues like this from negatively impacting a large number of customers, water quality kits are now sent to Denver Water employees periodically to check for potential errors. Confirming proper packaging and informational material will improve the customer experience and reduce the occurrence of inaccurate, misused or wasted water quality samples.

LBD-2: Sending monthly distribution lists to 120Water and CAL to provide the latest customer contact information.

Distribution lists and schedules for water quality kits are sent to 120Water and CAL to allow them to prepare for shipping, processing, and analyzing results. Although the total number of investigative water quality kits are established at the end of the preceding year, the water quality kits are not sent all at once in beginning of the year, but rather in smaller batches throughout the year. The preliminary address lists therefore have the potential to change prior to kit distribution, due to reasons such as changes in the inventory or the addition or removal of properties. In previous program years, 120Water relied on the distribution lists that were sent at the beginning of the calendar year to order water quality kit materials. Because of this, 120Water would end up with the incorrect number of materials throughout the year since the water quality distribution lists changed. This resulted in inefficiencies on 120Water’s side, and a large cost burden on the Program at the beginning of the year when bulk materials were purchased. To allow 120Water to order the appropriate amount of materials with the most accurate distribution lists, the LRP now distributes the schedules to 120Water and CAL monthly.

LBD-3: Mailing water quality sampling request letters to customers included in the investigation task order to reduce the number of unused water quality kits.

Results from water quality sampling are an important investigation technique used to identify a service line material as lead or non-lead. In the past, Denver Water has used incentives to motivate customers to return their water quality sampling kit received in the mail, such as a gift card drawing for customers who return their sampling kits. This effort did not make a large difference in return rates, which remained at 20% or less in previous program years. To reduce costs associated with unused water quality kits that are never returned for analysis, beginning in 2023, offer letters will be sent to customers asking them to participate, rather than sending the actual sampling kit. The letter will include a QR code where the customer can go to the Denver Water website and request an investigative kit to be mailed to them. It is important to note that results generated from water quality sample kits distributed this way will continue to be counted as investigative samples, and not customer-requested samples.

LSL Inventory

LBD-4: Developing a data dictionary to allow customers to use their address for online inquiries.

In 2022, the LRP implemented an online option for customers to complete LSL replacement consent forms and to request a filter pitcher or cartridge replacement. Originally, within the form, customers were required to enter their tap ID or premise ID. The original intent of asking for the tap or premise ID was to allow the data team to easily match the ID to the correct property within the program database. For customers that do not readily know the tap or premise ID, they would be able to input their address instead, but the usefulness of the address depends on how it is manually input (e.g., typos, “Dr.” versus “Drive”, etc.). As a solution, Denver Water developed a data dictionary where the customer can search for their address using a dropdown menu. This improves the customer experience while improving the accuracy of the information contained in the program database and ultimately maintaining efficient property identification.

LBD-5: Requesting interior inspections on a case-by-case basis to ease scheduling and improve efficiency of field work.

In 2022, the protocol to change the material designation of a service line (i.e., a p-value change) included four completed potholes and either a visual inspection of the interior connection of the service line or a WQ result. Each customer with an unknown lead status receives an email to schedule an appointment to enter their home for the interior pipe visual inspection. At the start of the 2022 investigative work, emails were sent to customers on a neighborhood-by-neighborhood basis to optimize the commute times to conduct the interior inspections to complete more visits per week. The first neighborhood visited in 2022 was the largest batch, with about 200 properties included in the email distribution list. In the four business days that followed the release of the email inviting customers to schedule their interior inspection, the phones and email accounts of LRP staff involved with scheduling were inundated with requests ultimately delaying responses to those customers. To remedy this in subsequent

neighborhoods identified for investigations, large neighborhoods were divided into batches of approximately 50 customers at a time to manage the schedulers' workload while providing a timely response to customer requests.

In 2023, the protocol to change the material designation of a service line (i.e., p-value change) includes four completed potholes. At properties where four potholes cannot be completed while the contractors are working in a neighborhood, interior inspections can be used to determine the service line material. When this occurs, Denver Water will schedule inspections. Given the large increase in investigation properties to be completed in 2023, this method allows Denver Water to maximize the number of properties for which the service line material can be designated while using interior inspections more efficiently.

ALSLR Program

LBD-6: Providing "Leave Behind Checklist" to customer prior to replacement to outline key milestones, construction details and what to expect.

Contractors conduct pre-construction meetings with customers to prepare them for their upcoming service line replacement and associated field work. During these pre-construction meetings, contractors received many questions from customers on what to expect. To streamline the information delivered to the customer and to provide the customers with consistent information during the pre-construction meetings, Denver Water developed a "Leave Behind Checklist" for contractors to leave with customers so that they can identify key milestones and what to expect for the field replacement work. This allows customers to have detailed information about the replacement process on-hand and to track where they are in the process. It also acts as a guide for the field crew to facilitate the pre-construction meeting, making sure key topics are covered and minimizing follow-up questions from customers.

LBD-7: Developing tap and meter decisions matrix for contractors to use for common tap and meter questions.

Occasionally, contractors will encounter an unplanned field condition. Examples include different tap and meter sizes, service line splits for multi-family homes and duplexes, and accessory dwelling units (ADUs). When contractors encounter these unplanned field conditions, they must follow-up with Denver Water for direction on how to proceed. This outreach causes a delay in work. To streamline decision-making and improve the efficiency of field work, the CM Team worked with Denver Water to create an "ALSLR Tap and Meter Decisions Matrix" for field staff to refer to when they encounter such issues. Contractors can locate the scenario in the matrix and advance with the recommended steps to proceed. This allows answers to be immediate, and for field work to continue.

Filter Program

LBD-8: Organizing filter cartridge replacements by ZIP code to reduce impacts of USPS delivery delays and to meet the six-month replacement cartridge requirement.

Section 5.B of the Variance requires filter cartridge replacements to be delivered to the customer per the manufacturer's standards (six months). Recent delays from USPS have threatened compliance, putting deliveries on customers' doorstops right at the six-month timeframe. To allow for a larger buffer time for USPS to deliver cartridge replacements, Denver Water is working with 120Water to re-sort the delivery lists by ZIP code. Organizing the shipments by ZIP code lessens the burden on USPS, allowing them to deliver the replacements prior to the six-month deadline.

Communications, Outreach and Education

LBD-9: Expanding use of reminder emails to customers to improve consent form return.

Two mailers and a door-knocking, at a minimum, are tools used by Denver Water to obtain consent from property owners for service line replacement. To improve consent form returns, a reminder email template was developed in 2021 to send to customers who have an email address associated with their account. In 2021, emails were piloted in areas with lower consent form return rates to gauge their effectiveness. Based on this success, in 2022 emails were used consistently across all areas identified for service line replacement, acting as an additional attempt to gain consent beyond the mailers and door-knocking. The email was also translated into Spanish and is used by bilingual team members to reach customers.

LBD-10: Developing online consent and filter request forms to expand digital, self-serve options for customers.

As part of the LRP launch, largely manual processes were established to distribute and collect consent forms for service line replacement and for customers to request replacement pitchers and/or filters when needed outside of the standard distribution timeline. Processing returned consent forms via traditional mail is time- and labor-intensive and can potentially result in weeks between the time a customer signs the form and the form being received, processed and communicated to the field. Similarly, customers who wished to request a replacement pitcher and/or filter would need to call or email Denver Water Customer Care, potentially navigating call wait times and waiting for the team to field through emails to manually enter the request in the system.

In 2022, Denver Water focused on identifying, developing and launching digital tools so that customers could more easily provide consent for service line replacement, and request replacement pitchers and filter cartridges. These tools also improve overall program efficiency by feeding into automated systems with quicker processing times. To gain greater efficiency with consent forms, an online consent form was developed and housed on Denver Water's website. Customers now receive a QR code on their mailed consent form linking directly to the online form. This gives the customer the option of either completing it online or mailing back a signed form. When a customer grants or refuses consent through the online form, the property's status is automatically integrated into the program database. Since it launched in April, over 2,000 customers have provided consent through the online form. Meanwhile, a new online filter form

(denverwater.org/Filter) gives customers the ability to immediately submit a request for a replacement pitcher or filter cartridge, in addition to the options of calling or emailing Customer Care. Links and QR codes to the online form have been included in virtual community meetings, subscriber emails and mailed materials. Since launching in September, over 1,800 requests have been submitted through the filter form.

Health Equity and Environmental Justice

LBD-11: Curating Spanish-speaking community outreach to address feedback from community.

When holding a Spanish-only virtual community meeting in 2021, attendance was much lower than other meetings. Based on this result and feedback from community partners who focus on the Spanish-speaking community, Denver Water identified that a virtual community meeting was not the most effective way to reach these customers. In 2022, instead of a virtual community meeting, Denver Water began working with its partners on other opportunities and tactics to reach the Spanish-speaking community. Beginning in 2023, targeted outreach to this community will focus more on engaging with young families and participating in family events within the community.

LBD-12: Providing program information in additional languages to expand support and program accessibility.

Since the start of the LRP in 2020, all program materials have been provided in both English and Spanish. Additionally, core program materials, such as the consent form and filter kit booklet, have been available in Arabic. Support in additional languages is available through community partners and Denver Water's translation and interpretation vendor. Based on the 2023 work areas for service line replacement, a need was identified for materials in Vietnamese. Core program materials are currently being translated into Vietnamese based on this need, and additional outreach support will be considered as appropriate throughout 2023.

LEARNING BY DOING PROCESS UPDATES FOR 2023

The Learning by Doing process itself can benefit from review and modification. The timing of the Learning by Doing review and how learnings are captured have been adapted for each LRP element. In 2023, coordination will be scheduled on a semi-annual basis to review the learnings and address modifications in a manner that consistently brings together the program elements and reflects the holistic philosophy of the LRP.