

DENVER WATER LEAD REDUCTION PROGRAM

LEARNING BY DOING - 2020

Version 1.0: January 29, 2021

Presented by: Denver Water



TABLE OF CONTENTS

List of Tables.....	4
List of Acronyms	5
Introduction and Rationale	6
Methodology	7
Stakeholder Advisory Committee.....	8
Examples of Learning by Doing.....	8
LSL Inventory	10
ALSLR Program.....	11
Filter Program.....	12
Communications, Outreach and Education.....	13
Health Equity and Environmental Justice	13
Learning by Doing Process Updates for 2021	14

LIST OF TABLES

Table 1. Overview of Learning by Doing Examples	9
---	---

LIST OF ACRONYMS

ALSLR	Accelerated Lead Service Line Replacement
CCT	Corrosion Control Treatment
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
LSLR	Lead Service Line Replacement
OCCT	Optimized Corrosion Control Treatment
Order	Variance Order
RNO	Registered Neighborhood Organizations

INTRODUCTION AND RATIONALE

In response to the COVID-19 pandemic, modifications were made to the collection process for Lead and Copper Rule tap sampling, the COE Program and the ALSLR Program. Protocols to manage the health and safety concerns due to COVID-19 were put in place including the use of masks by field crews and customers along with physical distancing protocols to allow work to continue. Investigations and LSL replacements were focused on Denver Public Schools, critical customers such as child care facilities and commercial customers that are closed to confirm the status of the service line and replace lead where found. Outreach activities including collaboration with the LRP community partners led to a shift from in-person activities to virtual engagements as a result of the COVID-19 pandemic.

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. Implementation of the Lead Reduction Program Plan (LRPP) in accordance with the EPA's December 16, 2019, Variance Order (Order) and the November 15, 2019, letter from the Colorado Department of Public Health and Environment (CDPHE) regarding conditional approval of Denver Water's request for modification of optimal corrosion control treatment (OCCT) began in December 2019. The EPA approved the Order for an initial three-year period to provide the opportunity to demonstrate that the LRPP will effectively reduce lead in drinking water over the 15-year period.

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 2020). 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 Order goals.
- 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 collaborative 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 2020. Preliminary Learning by Doing ideas were presented in the quarterly 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, Registered Neighborhood Organizations (RNOs), 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 2020 committee members was included with the second quarterly report.

The Stakeholder Advisory Committee was convened three times in 2020. The primary topics included:

- Onboarding and orientation to the program.
- Overview of virtual community meeting polling results and solicitation of feedback related to increasing awareness and education on cooking with filtered water.
- Overview of how work areas are determined, including a conversation on the LSL Inventory, equity and logistical considerations.

Feedback from the RNOs on the committee indicated that they are primarily interested in receiving updates on construction impacts (parking, detours, etc.) for their neighborhood. This insight led to a shift from RNO participation in the Stakeholder Advisory Committee to the establishment of a neighborhood liaison outside of the Stakeholder Advisory Committee to interface with RNOs. The neighborhood liaison provides construction updates and engages with RNOs throughout the year based on specific RNO interests.

In 2021, the goal for the Stakeholder Advisory Committee is to meet four times, beginning in January.

EXAMPLES OF LEARNING BY DOING

Examples from the 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 1, 16 examples of Learning by Doing are included in this submission. The 16 examples address improvements related to improving the customer experience, protecting public health and/or improving the efficiency of the LRP. Additional examples are described in the quarterly reports.

TABLE 1. OVERVIEW OF LEARNING BY DOING EXAMPLES

LRP Element	Number	Description	Desired Impact
Corrosion Control Treatment	LBD1	Using water quality sample results in field work.	Improve program efficiency.
	LBD2	Collecting more representative water quality samples.	Improve program efficiency.
LSL Inventory	LBD3	Using customer information to make improvements to the LSL Inventory.	Improve program efficiency.
	LBD4	Integrating inventory updates with ALSLR field actions.	Improve program efficiency.
ALSLR Program	LBD5	Increasing visibility and awareness of the LRP in field work.	Improve program efficiency. Improve the customer experience.
	LBD6	Encouraging customer flushing after LSL replacement.	Protect public health.
	LBD7	Managing property impacts.	Improve the customer experience. Improve program efficiency.
Filter Program	LBD8	Managing high volume filter users.	Improve the customer experience.
	LBD9	Managing occupancy changes.	Protect public health.
	LBD10	Confirming filter kit distribution.	Protect public health.
Communications, Outreach and Education	LBD11	Adjusting the COE plan for COVID-19.	Protect public health. Improve program efficiency.
	LBD12	Cooking with filtered water strategy.	Protect public health.
Health Equity and Environmental Justice	LBD13	Adjusting the ambassador program for COVID-19.	Improve the customer experience. Protect public health.
	LBD14	Bridging digital and in-person engagement.	Improve the customer experience. Protect public health.
	LBD15	Managing tenant outreach.	Protect public health.
	LBD16	Producing Spanish-first content.	Improve the customer experience. Protect public health.

Corrosion Control Treatment

LBD1: Using Water Quality Sample Results in Field Work to Improve Program

Efficiency Results from verification water quality sampling are used by both the LSL Inventory and the ALSLR Program to identify lead in the water system. This is a useful tool to confirm the presence of a lead service line, which can then be scheduled for replacement, and to reduce the replacement of copper service lines. To accommodate the ALSLR Program, the return, analysis, review and application of water quality sampling is effective when results are available before ALSLR crews arrive in a neighborhood. As crews leave a neighborhood, water quality sample results are also used in the ALSLR task order closeout procedures. Water quality sample kits that are delivered to customers – but not returned and analyzed – risk delaying completion of individual service line replacement and the overall LRP. To encourage the return of water quality sample kits in a timely manner, distribution of a water quality test notification letter to customers ahead of water quality sample kits was initiated. In ALSLR task orders carried out in 2021, the status of water quality sample kits will be regularly reviewed, and the number returned assessed prior to the start of construction. Based on the water quality kit return rates, the need for additional outreach tactics will be considered. This approach also provides more time to encourage customers to return sample kits in advance of ALSLR work in a given neighborhood.

LBD2: Collecting More Representative Water Quality Samples to Improve Program

Efficiency Water samples are collected by customers before and after LSL replacement to identify potential sources of lead. The availability and accuracy of lead sampling can be used by the customer to understand the risk of lead exposure in their home. If a sample kit is returned with an inadequate volume of water (e.g., because it leaked or the bottle was not filled properly), the sample result is dismissed. The instructions are being modified to clearly distinguish the water fill line on the sample bottles provided to customers.

LSL Inventory

LBD3: Using Customer Information to Make Improvements to the LSL Inventory to

Improve Program Efficiency Some customers may have information about service line material that can improve inventory accuracy. To capture this information to update the LSL Inventory, a “contact and ticket system” via Workfront was implemented. The status (i.e., p-value) of a customer’s service line is adjusted based on information provided by the customer that conclusively confirms the service line material. This modification is a benefit to the LRP in that it is a relatively low-cost and reliable means to improve the information contained in the LSL Inventory, although the success of this approach depends on the availability of accurate customer information (for example, a receipt from a plumber documenting replacement of the service line prior to the LRP).

LBD4: Integrating Inventory Updates with ALSLR Field Actions to Improve Program Efficiency When field crews visit a property included in the ALSLR Plan, they use the status of the service line (i.e., p-value) to determine what activities are needed before the service line is replaced from service and replaced with copper. For example, if the p-value indicates a known lead service ($p = 1$), the field crew proceeds to replace the service line without additional field verification (potholing). However, if the p-value indicates a possible or suspected lead service (i.e., $p\text{-value} \geq 0.5$ and < 1), additional field verification is performed to confirm lead before proceeding to replace the service line. The timely availability of accurate information describing the likelihood of finding lead is critical to the success of the LRP: field crews know what to look for at a given site, lead service lines are replaced efficiently when confirmed, and the customer has confidence in the outcome for their property (be it confirmed lead or non-lead). To address this, regular review of p-value changes before (and while) field crews are working on a task order will minimize unnecessary field verification activities. This process will be further refined in 2021.

ALSLR Program

LBD5: Increasing Visibility and Awareness of the LRP in Field Work to Improve Program Efficiency and the Customer Experience Through Learning by Doing meetings with ALSLR contractors, it was revealed that some customers may not be aware that work is coming to their area if time has passed between receiving notification packets and work beginning. Neighbors and other community members may also wonder what work is being performed in their area. In response, yard signs were placed in work areas in advance of and during LSL replacement activities. Feedback on their effectiveness was gathered to inform the verbiage used on signage in 2021. Additionally, in 2021, a good neighbor mailing will be sent to customers to describe expected work and construction impacts to both LSL replacement customers and their neighbors before contractors mobilize in the area.

LBD6: Encouraging Customer Flushing after LSL Replacement to Protect Public Health Flushing after LSL replacement is used to purge the service line and plumbing of particles (including lead) dislodged during construction activities. Whereas the ALSLR contractors and field crews flush the service line outside the home, customers are relied upon to flush the interior in the days following the replacement. Customers are provided flushing instructions with additional resources, such as a video, available on the Denver Water website. Anecdotal information has been received that some customers are not properly following the flushing instructions. Disregarding post service line replacement flushing may be due to customers not recognizing the importance of this activity, customers not adhering to the prescribed step-by-step instructions or physical or mobility needs limit a customer's ability to carry out the flushing. To address this observation, the emphasis on flushing will be enhanced in engagement activities, such as virtual community meetings and pre-construction meetings with residents. Field crews will employ door hangers to leave behind flushing instructions for residents of multi-family properties who may not be present during the LSL replacement. There are limited data available to assess the current performance and sampling is unlikely to capture the benefit of immediate lead reduction following LSL replacement although a slight reduction in lead levels measured in post-LSL replacement water quality samples may be observed.

LBD7: Managing Property Impacts to Improve the Customer Experience and Program Efficiency Efforts continue to align with local regulatory partners to improve the customer experience and address potential concerns regarding impacts to streets and trees, and stormwater facilities. The efforts include understanding and managing customer expectations of infrastructure impacts. For example, the use of block patching requires coordination among the City right-of-way personnel, the paving and patching contractors, and the LRP field staff to review and identify satisfactory modifications to standards. The outcomes from the coordination is communicated with the ALSLR contractors and Denver Water crews. As a result of this coordination, the potential risk of customer complaints and restoration costs is expected to decline. Additionally, based on inquiries, more in-depth talking points on trees were developed to support Denver Water Customer Care when fielding questions from customers.

Filter Program

LBD8: Managing High Volume Filter Users to Improve the Customer Experience Customers receive replacement filter cartridges approximately every six months based on the manufacturer's recommendation for the replacement interval. Some customers use more water than others for drinking, cooking and infant formula preparation and, as a result, require a filter replacement cartridge sooner than the typical consumer. The risk of lead breakthrough increases with the cumulative volume of water passed through the filter, and because the time to filter slows down, customers may become inconvenienced and discontinue filtering tap water prior to consumption. Customers who call Denver Water Customer Care and request additional filter replacement cartridges are added to a list of "high volume" users and provided with additional cartridges at each replacement interval. By identifying high volume filter users and providing additional replacement cartridges, this group is likely to continue to use the filter.

LBD9: Managing Occupancy Changes to Protect Public Health When the occupancy of a property changes, the Order mandates the provision of filter education and outreach within 14 days and a filter kit within 35 days of the change in occupancy. To promptly identify occupancy changes, the frequency with which a list of occupancy changes is generated and reviewed was increased to a daily effort. New LRP introduction letters and booklets, which include Filter Program information, are produced and mailed to customers to meet the 14-day turnaround schedule and properties are added to lists for weekly distribution of filter kits to meet the 35-day turnaround schedule. Streamlining the process to identify and follow-up with occupancy changes on a daily basis was necessary to meet the schedule requirements of the Order and protect public health of users.

LBD10: Confirming Filter Kit Distribution to Improve Public Health The delivery of filter kits to customers is actively managed: filter kits returned by the U.S. Postal Service are monitored as part of a detailed "return-to-sender" analysis. As filter kits are mailed to customers enrolled in the LRP, the status of the delivery is coded as "delivered," "ordered" or "shipped." To confirm if "ordered" or "shipped" filter kits were received, and to confirm the proper mailing address for returned filter kits, robocalls are used to gather information from customers about the status of their filter kits. Filter kits are re-sent to customers who report that they did not receive

the kit. Emails are also sent to customers for which the filter kit delivery status is unclear to reach additional customers who may not respond to the robocall to gather the necessary information. Individual calls are also made to customers to help reconcile returns and new filter kits are sent to the reconciled addresses. Of the 105,000 filter kits that were distributed in 2020, approximately 4,000 addresses have been included in the “return-to-sender” analysis to confirm that these customers received their filters. This is an example of modifications to the filter kit distribution to confirm that filters are available to the customers that need them.

Communications, Outreach and Education

LBD11: Adjusting the COE Plan for COVID-19 to Protect Public Health and Improve Program Efficiency In response to the COVID-19 pandemic, a COVID-19 adjustment strategy was developed that focused on shifting in-person engagement activities to virtual and digital tactics. As part of this shift, a series of 12 bilingual, virtual community meetings were held from June through October engaging over 8,500 community members in the service area. The virtual meetings were an opportunity for customers to hear directly from Denver Water and the LRP team and ask questions.¹ Advertising efforts in priority neighborhoods were also increased to reach communities through small billboards, local newspapers and digital messaging. This focus on virtual and digital engagement will continue into 2021.

LBD12: Cooking with Filtered Water Strategy to Protect Public Health During each virtual community meeting, informal polls were conducted to gather insights into filter use among the community, providing early indications of where messaging and tactics should be focused to strengthen filter adoption. Participants reported less use of filtered water for cooking than for drinking water or infant formula preparation. In response, two paid media campaigns were launched in July and October 2020 emphasizing the importance of using filtered water for cooking. The campaigns included digital ads, targeted community newspaper ads and small billboards. Online media placements alone generated 7,607,129 total impressions, representing 10 times the number of people who live in the City and County of Denver (approximately 720,000) and 5 times the 1.5 million people served by Denver Water. An expanded cooking with filtered water strategy will be implemented in 2021.

Health Equity and Environmental Justice

LBD13: Adjusting the Ambassador Program for COVID-19 to Improve the Customer Experience and Protect Public Health In addition to the COVID-19 adjustment strategy developed to address COE efforts, the scopes of work for the Ambassador Program’s two community partners, iNOW and CREA Results, were adapted to focus on virtual and digital community engagement. This resulted in the launch of a virtual help desk to provide assistance in five languages (other than English or Spanish) to customers who have questions on the program, virtual focus groups on filter use and a renewed emphasis on social media and videos. While Ambassador Program partners will continue to take advantage of safe, in-person

¹ Please Appendix COE-F.1 COVID-19 Adjustment Strategy in the second quarterly report.
DENVER WATER

engagement opportunities as they become available during the pandemic, the focus on digital and virtual engagement will continue in 2021.

LBD14: Bridging Digital and In-person Engagement to Improve the Customer Experience and Protect Public Health The COVID-19 pandemic presents additional challenges for those without computer or Internet access to engage with and participate in the program. With this in mind, virtual community meetings were promoted and fully accessible via both phone and computer, resulting in 5,775 community members participating by phone. Ambassador Program community partners also participated in safe, in-person community events held throughout the City and one-on-one meetings with customers where possible, engaging over 2,400 individuals in this manner.

LBD15: Managing Tenant Outreach to Protect Public Health The degree of contact information available for tenants is known to be less than for property owners; this is further exacerbated when no notification of a change of occupancy at rental properties is made. To address this, a letter is distributed to leasing offices at larger apartment complexes to begin coordination to provide new tenants with LRP information and filter kits upon move in. Distribution of these materials is underway and will continue in 2021 as additional opportunities to reach this population are explored.

LBD16: Producing Spanish-first Content to Improve the Customer Experience and Protect Public Health While translated content provides Spanish speakers with program information in their primary language, it does not address opportunities for providing messaging and copy developed within the cultural context of the Spanish language and Spanish-speaking communities. To improve the impact and resonance of the Spanish content, opportunities to create English and Spanish versions of content simultaneously, particularly where creative, unique content is being developed, will be identified. An example may be creating content and stories for Denver Water communication channels with cultural considerations in mind. When Spanish-first content cannot be developed – or if it is not appropriate – the English content will be re-created or “transcreated” in Spanish rather than directly translated. Paid media campaign content was transcreated in Spanish in 2020 and transcreation of the program website is planned for 2021.

LEARNING BY DOING PROCESS UPDATES FOR 2021

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 2021, coordination will be scheduled on a quarterly 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.