APPENDIX III.D.1 - ACCELERATED LEAD SERVICE LINE REPLACEMENT PLAN

DRAFT FOR PUBLIC COMMENTS

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DENVER WATER

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Project name: Accelerated Lead Service Line Replacement Plan

Project ref: Denver Water Lead Reduction Plan

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Appendix III.D.1. Accelerated Lead Service Line Replacement Plan

Introduction

Background and Purpose

The Denver Water (DW) Lead Reduction Program (LRP) provides a path forward for Denver Water to replace all lead service lines (including galvanized downstream of lead) within its service area (including distributors) over the next 15-years. To support this effort, the enclosed Accelerated Lead Service Line Replacement (ALSLR) Plan describes the general steps and the estimated resources needed to replace approximately 75,000 [final number will be agreed upon by Environmental Protection Agency (EPA), Colorado Department of Public Health and Environment (CDPHE), and Denver Water at August 13th Variance Check-in #5 and inserted into the final LRP Plan submittal due August 20, 2019.] lead service lines (LSLs) with a 7.0% cumulative average replacement rate (or approximately 5,250 lead service lines per year).

The goal of the ALSLR Plan is to develop an approach that allows for the consistent and reliable replacement of services over the next 15-years. The ALSLR Plan was prepared to develop a contracting and procurement strategy for Denver Water based on lessons learned from other Lead Reduction Programs (LRPs) that have successfully replaced a comparable number of lead services, on the order of a few 1000s per year. The contracting and procurement strategy for the ALSLR Plan is presented in the three construction phases: Pre-Construction Phase, Construction Phase, and Post Construction Phase. The ALSLR Plan describes the close collaboration necessary with the other LRP elements including the Filter Plan, Communications, Outreach and Education (COE) Plan, and Lead

Service Inventory (LSI – Predicative Model). The reader is directed to Table III.E-1 below, for a list of pertinent Definitions and Acronyms used in this Technical Memorandum as a reference guide.

Table III.E-1. List of Definitions and Acronyms

Definition or Acronym	Descriptions
ALSLR	Accelerated Lead Service Line Replacement
AL	Action Level
CDPHE	Colorado Department of Public Health and Environment
CI	Construction Inspector
CM	Construction Manager
COE	Communications, Outreach, and Education
DW	Denver Water
EJCDC	Engineers Joint Contract Documents Committee
EPA	Environmental Protection Agency
KPI	Key Performance Indicator
LSI	Lead Service Inventory
LRP	Lead Reduction Program
LRP Plan	document submitted to EPA/CDPHE as the technical document that supports Denver Water's variance request.
LSL	Lead Service Line
LSLR	Lead Service Line Replacement
Non-copper	Refers to materials such as lead, galvanized, and polyethylene
Program	Refers to program staff from Denver Water and/or program management firm as appropriate for the task at hand.
POU	Point of Use (as in POU filter)
Resident LSLR	Resident Lead Service Line Replacement – Resident who may receive a lead service line replacement may be referred to as Homeowner, Customer, or Property Owner **To Be Confirmed**
RFP	Request for Proposal
ROM	Rough Order of Magnitude
TBD	To Be Determined
TM	Technical Memorandum
YoY	Year-Over-Year

References

1. Denver Water Standards / Specifications
2. AWWA/ANSI Standard C810-17
3. Denver Water Procurement Process
4. Predictive Model and Prioritization (Appendix III.B.3)
5. Draft LRP Plan Submissions
6. Filter Adoption (Appendix III.C.1)
7. Filter Pilot (Appendix III.C.2)
8. Filter Plan (Appendix III.C.3)

9. Communications, Outreach, and Education Plan (Appendix III.A)

LRP Variance Criteria

Overview

The ALSLR Plan has been developed to meet certain Key Performance Indicators (KPIs) established in the LRP. The success of the ALSLR Plan depends on the success of other LRP elements, namely the COE Plan and Filter Plan, and will undergo continuous improvement through the Learning-by-Doing element. The ALSLR Plan will address the following key LRP variance criteria elements;

- Denver Water will replace all lead services, from the main to the first connection inside the dwelling. Lead services include galvanized pipe downstream of lead.

- The target of 7.0% annual replacements is based on a total estimated number of known and suspected lead services of 75,000 [final number will be agreed upon by Environmental Protection Agency (EPA), Colorado Department of Public Health and Environment (CDPHE), and Denver Water at August 13th Variance Check-in #5 and inserted into the final Lead Reduction Program Plan submittal due August 20, 2019.].

- A LSL replacement for compliance is counted as fully replacing the lead or lead/galvanized service line from the water main to the premise.

- The overall LRP objective of replacing the lead service is to remove the major source of lead from customer's drinking water supply. This implies that all portions of the lead or lead/galvanized service line will be replaced in full – no known lead service line remains. Where a portion was previously replaced - confirmed through LSL investigation activities, the remaining lead or lead/galvanized service line will be replaced. Conditions under which the lead would not be replaced are limited to earning consent from the property owner to replace the service line. If consent is not provided, additional actions are triggered, as discussed in this Plan.

NOTE: evaluation criteria and reporting needs are under development and will be introduced into this section once confirmed

Annual LSLR Criteria and Resource Requirements

Based on the lessons learned from other LRPs as well as Denver Water's history of LSLRs, a LSLR Resource Summary table was prepared and presents the anticipated range of level of effort (expressed as number of crews) that will be required to meet the 7.0% target for annual replacements based on various assumptions (see Table III.D-2). Denver Water's water main replacement program as well as other similar programs has found that their LSLR crews have consistently replaced from two to four LSLs per day depending upon various circumstances. Based on the preliminary LSL inventory of 75,000 (TBD), Denver Water will need approximately 7 to 13 LSLR external crews, (see Table III.D-2) to achieve an annual 7.0% replacement rate (or approximately 26 LSLRs daily).

Table III.D-2. 15-Year LSL Replacement Resource Summary

Estimated LSL Inventory	Annual Removal 7.0%	Total Daily LSLR 200 work days	No. of Crews*			
			LSLR/day per Crew 2	LSLR/day per Crew 2.5	LSLR/day per Crew 3	LSLR/day per Crew 4
80,000	5,600	28	14	11	9	7
75,000	5,250	26	13	11	9	7
65,000	4,550	23	11	9	8	6
55,000	3,850	19	10	8	6	5

*Based on experience from Denver Water as well as other jurisdictions, a single crew can replace between 2 and 4 LSLs per day.

Overview of Other LRPs from Other Jurisdictions

Introduction

Denver Water reviewed the experience of other jurisdictions who replaced lead services in their water systems and the associated lessons learned helped guide the development of the proposed ALSLR Plan's contracting and procurement strategy, including the anticipated LSLR rates, delivery delays, and risks.

The previous LRP's experience was gathered from the City of Flint, Pittsburgh Water and Sewerage Authority, and Detroit Water and Sewerage Department based on AECOM's experience working with these water systems as well as information that is publicly available. The City of Flint, under an Emergency Order, replaced approximately 18,000 LSLs from December 2017 to January 2019. The Pittsburgh Water and Sewerage Authority, under an Administrate Order due to multiple Action Level (AL) exceedances, is mandated to replace 7.0% of approximately 14,000 LSLs per year from June 2017 to December 2019. Per the July 2018 Michigan Department of Environment and Quality Lead and Copper Rule, the Detroit Water and Sewerage Department needs to replace more than 125,000 LSLs at a replacement rate of 5.0% per year. Key lessons learned in terms of procurement, describing the scope and responsibilities of all parties to the LRP, and defining the process and steps involved with replacing the LSLs (see Table III.D-3). A preliminary list of potential risks to delivery are summarized in Table III.D-4, based on experience gained from other jurisdictions when replacing lead services on the order of 1000s per year.

Table III.D-3: Lessons Learned from Other Jurisdictions – Procurement, Contracting, and Scoping the Work

Item No.	Description
1	Provide a standard process and expectation related to invoicing when working with multiple contractors (one form for all contracts, offset invoice submittal schedule, enough back up provided with invoice). *Why? This will expedite accurate budget status reporting*
2	Delineate the roles and responsibilities regarding the Contractor and Client Representative communicating any aspect of LSLR work to Residents and ultimately to the regulatory agencies, consistent with the COE Plan. *Why? This will improve the effectiveness of the COE Plan and the overall LRP.*

3	Determine who will perform restoration efforts and describe scope in the Contract Documents accordingly. Consider hiring a separate contractor to be responsible for the restoration work, such that the LSLR crew is not responsible for any external restoration activities such as curb and gutter, landscaping (including turf), hardscaping, or sidewalk modifications, including: (1) filling any excavations on private property with removed soils (2) placing sod, concrete sidewalks and any concrete hardscaping in the public right of way (ROW) (i.e., in small sections of driveway) (3) completing final street paving, sidewalk replacement, and sod after the work order is completed. *Why? This promotes more efficient restoration work process and delegates the task a Contractor more specialized in this type of work. Note that Denver Water's current policy is to provide external restoration only.*
4	Determine the timelines and means and methods to communicate with the Property Owner (and Residents, if not the same) all aspects of the LSLR process. For example, the Client Representative should mail agreement packages to the Property Owners at least 45-days ahead of replacement. Details to be finalized in coordination with the COE Plan. *Why? This will inform the Property Owner of work to come and how they can prepare the property for the work. This will also allow the work to be performed efficiently, avoiding delays to obtain consent on the day of work.*
5	Describe expectations of the Contractor and Client Representative with respect to conducting Property Owner coordination meetings. The purpose of this meeting is to review the work process and potential restoration needs. Details to be finalized in coordination with the COE Plan, *Why? Supports maintaining the customer's trust in Denver Water while allowing the work to proceed efficiently.*
6	Allow one construction inspector (CI) per crew to keep up with reviewing the scope of work being performed, collecting the data necessary, and completing the daily paperwork. Communicate this expectation to the contractors bidding the work. *Why? Having adequate CIs will ensure work is accurately documented and uploaded to the lead service inventory in a timely fashion.*
7	Delineate roles and responsibilities for the Contractor and Construction Manager (CM) in the Contract Documents for who does what with respect to obtaining consent, flushing the service line post LSLR, and distributing filters etc. *Why? This will provide more transparency of expectations and accuracy during the procurement process, while reducing costs, protecting public health, avoiding duplication of effort and improving efficiency and quality of the LRP during execution*
8	Make mandatory the pre-bid conference to prevent excess time spent on RFP questions and unrealistic bids. *Why? Manages effort involved to procure the construction contracts*
9	Define the scope of work to attract companies that have the capability to operate with multiple crews simultaneously *Why? To improve consistency of the work while reducing the level of effort to manage all the Contractors.*
10	Demonstrate that contractors are qualified to perform the work. Contractors should be required to provide examples of projects with similar scale and scope to qualify for bidding. Unqualified contractors have shown that the critical schedules cannot be met, and the quality of work performed is lacking. *Why? To improve the quality of the work, to deliver on KPI expectations particularly related to budget and schedule.*
11	Manage the number of LSLR sites included in a work order (i.e., 200 to 500 addresses). *Why? Optimizing the Contractor's amount of work will lead to better management of their work load and quality of work. This also allows the Program to be responsive to changing field conditions. The range of sites included in a work order will be determined during the annual ALSLR planning exercise.*

12	Establish the needs for master plumbers to a) connect the service line to the water main, b) install water meter boxes where needed, and/or c) inspect the meter box installation as part of developing the contract documents. Require bidders to carry to master plumbers. *Why? Inadequate staff of plumbers could delay meter installs and leave Property Owners without water.*
13	Ease the evaluation of contractor bids by assuming that at least two full LSL replacements are completed per day per contractor crew. This is an average used for bidding purposes. If a crew works a 10-hour day, an average value of four LSL replacements will be completed per day. *Why? This will aid in the evaluation of bid pricing, assess level of effort bid, and determine how many crews are needed to meet the targeted rate of annual LSL replacements.*
14	Have Contractors be responsible for documenting conditions at a property before the work commences, using photographs with notes. This will then provide the basis of any customer questions about the work. *Why? This puts the onus of documentation (or proof) on the Contractor and reduces risk to the Owner.*

Table III.D-4: Lessons Learned from Other Jurisdictions – Delivery Risk

Item No.	Description
1	Large programs need protocols for reporting and tracking data in a consistent and timely manner that allows for QA review. Although it is reasonable to expect changes to data handling will occur over the life of the Program, managing these changes to reduce the risk of delays and potential claims is recommended. *Why? To promote quality and timeliness in data handling while providing some degree of consistency to the contractors with respect to executing the scope of the work.*
2	Strategies to promote continuity over the life of the Program should be built into the ALSLR Plan and LRP in general. For example, having a mechanism that promotes for knowledge transfer as staff assigned may change over the 15-year life of the program. *Why? To realize program efficiencies year-over-year and supporting the Learning-by Doing element of the LRP. The intent is to reduce the impact of delays or inefficiencies when transitioning from one year to the next.*
3	Know the stakeholders involved and collaborate work with them to earn support for the LRP in general. Manage stakeholders through the COE Plan. *Why? The LRP will benefit from stakeholder input and proactively managing this will limit the potential for surprises.*
4	The success of the ALSLR Plan depends on participation of the property owner (and resident if not the same person) and as such the number of replacements that can be completed each year depends on earning consent from the property owner as well as the resident performing certain actions. Coordination with the COE Plan and clear protocols for multiple opportunities to communicate with the property owner and residents need to be developed. *Why? Poor participation rates could make it challenging to meet the annual target for LSL replacements.*
5	With multiple capital programs operating in the neighborhoods, coordinating schedules among the various programs for water main, road work, or other infrastructure improvements will reduce the potential inconvenience to residents in addition to realizing schedule and cost savings. Annual planning efforts for the ALSLR Plan would benefit from incorporating schedule considerations from these other infrastructure programs. W*hy? This will demonstrate project organization to the Property Owners, and reduce potential Property Owner complaints for extra work being performed.*

The proposed procurement strategy, contract documents to support the ALSLR Plan and the associated procedures that the work will follow will be developed based on the lessons learned from other jurisdictions and feedback received from area contractors during Industry Days and Pre-Qualification meetings.

Finding Lead and the Predictive Model

Introduction and Overview

Planning the annual lead service replacement locations and achieving the annual replacement numbers depends on knowing where lead services are in the system, so that replacement can be planned based upon:

- Individual premises with historic lead levels above 15 ppb and/or demographic risk; and
- Geographic areas with cumulative opportunities to reduce lead exposure.

As Denver Water updates its Lead Service Inventory (see section III.B), probability models can be used to predict where lead is likely to be found before proceeding with LSLR at a particular property. As further described in the Appendix III.B.3 (Predictive Model and Prioritization) and briefly described herein, the probability of a service line being constructed of lead will be incorporated into ALSLR planning efforts using the current LSL status cohorts as shown in Table III.D-5. To implement the ALSLR Plan, a list of properties on which to act must be extracted from the inventory on a regular basis (annually or more frequently). Actions on properties will be determined based on LSL status cohort. The preliminary set of thresholds and action groups of Table III.D-5 is based on the current model predictions and will be confirmed via discussions with Denver Water as the LRP is developed.

Under the LRP Phase I inventory model, properties identified to have suspected or possible lead service lines will be enrolled in the Filter Program and provided with filters that are NSF certified for lead removal. Properties within LSI Groups A and B (known, suspected, or possible lead service line, see Table III.D-5) are the focus of the ALSLR Plan as further described below. Those properties with a suspected or possible LSL (Group A and B) will be subject to additional investigation methods and LSL replaced if found. A statistically defensible sampling of select properties unlikely to have a lead service are anticipated to go through a phased investigation process, starting with reviewing the sources of information that led to the LSL status cohort determination for the property. Desk-top and field methods will be applied to the Group A and Group B properties to determine whether or not a lead service exists, with the intention of either replacing the LSL (if lead is confirmed) or removing the property from the Filter Program (if no lead is confirmed). The phased investigation methods are summarized in Table III.D-6 and were designed to answer the question “does the predictive model make sense” when assigning LSL status cohorts to properties. [Details will be refined after the first run of the predictive model with the updated LSI in August 2019.]

Table III.D-5. LSL Status Cohorts and Actions

Group	LSL Status Cohort	ACTION AND RESPONSES		
		Filter Program	Lead Inventory	ALSLR Program
A	Known lead service line	Provide Filter	Materials Known	Add to list for replacement or remove from inventory / Filter Program through replacement
B	Suspected and Possible lead service line	Provide Filter	Confirm materials (per Table III.D-6)	Add to list for replacement or remove from inventory / Filter Program through replacement
C	Unlikely lead service line	Statistically Defensible Select Sampling / COE		
D	Confirmed to be lead-free	Sampling / COE		
E	Other (fire lines, recycled water taps, consecutive system)	No Action / COE		

*Table was developed using information in Appendix III.B.2 (Preliminary Identification of Lead Service Lines) and Appendix III.B.3 (Predictive Model and Prioritization) and will be updated as the appendices are updated.

Table III.D-6. Summary of Phased Investigation Process

LSL Status Cohort (probability value of lead service line)	Sequence of Investigation Method	Comment
Known or Suspected lead service line (≥ 0.8)	Confirm lead as part of replacement planning	For a property with a probability value of 0.8 or higher, the Denver Water property or household is treated as if there is a known lead service with investigation to be confirmed before replacement activities commence.
Possibly lead service line (≥ 0.5 to < 0.8)	These properties will be provided with a filter that is NSF certified for lead removal in year one of the LRP. During year one, Denver Water will perform additional work to update the probability value determination and categorization of the property has having a known lead service line or non-lead service line. ○ For example, a Denver Water property or household with a probability value of 0.7 or higher will first be subjected to a visual inspection, following by potholing, and if necessary, excavation to confirm the service line material. ○ For example, a Denver Water property or household with a probability value of .6 to 0.8, the data used to determine the p-value will be reviewed, followed with water quality sampling and contact with the property owner to understand the history of upgrades to the property. *confirm what this looks like once we have the predictive model up and running	Denver Water will initially focus on properties or households with a relatively higher probability value to confirm inclusion in the ALSLR Plan and the Filter Program.
Unlikely to have a lead service line (< 0.5)	Review historical data used to determine the probability value: do the data make sense and can outliers be explained? ○ If not, follow-up with water quality sampling to assess likelihood for finding lead ○ If water quality sampling results are inconclusive, visit the property and conduct visual assessment and contact property owner to understand history of updates to the property, if any If still inconclusive, proceed to more invasive field inspections, starting with potholing.	Where a low probability value is determined for a property that appears to be an anomaly in a street or neighborhood with known lead services, Denver Water will review the factors that contributed to the probability value determination and escalate investigation as needed to confirm the presence of lead or non-lead.

NOTE: Values provided, in the table above, are provisional and subject to change.

Preliminary 2020 ALSLR Plan for Discussion Purposes

The 2020 ALSLR Plan will focus on Groups A and B as outlined in Table III.D-7. Within each of these Groups, Denver Water has categorized three LSLR Groups by various types of LSL properties' conditions (Table III.D-7); Geographic LSLR Area, Individual LSLR, and Investigations of LSL types. The estimated LSLR for 2020 is to achieve the 7.0% cumulative average replacement rate of approximately 5,250 LSL and is based on Denver Water current approximations of past historical information. The LSLR volumes in each category will be further developed as the LRP matures over the next 2 to 4 years and as the predictive model becomes better calibrated using the Group B investigation results as well as information from Group A replacements.

Table III.D-7. 2020 ALSLR Plan Summary

Group/Type		Est. Annual LSLR & LSL Investigation
GROUP A – LSLR by GEOGRAPHIC AREA	Water main Replacement	400
	Block by Block or Street by Street	3,000*
	Municipal Pavement and Road Improvement Programs	450*
	Sub Total	3,850*
GROUP A – LSLR by INDIVIDUAL	Leaks	300
	Individual & High Priority LSLR	600*
	Scrape Off and Redevelopment Properties	500
	Sub Total	1,400*
	Group A Total	5,250*
GROUP B - INVESTIGATION	Investigations for areas suspected and possible for LSL	500*
	Water Quality Testing of areas expected or somewhat expected to have LSL	500*
	Group B Total	1,000*

(*) asterisk indicates the values are provisional and subject to change.

A geographic depiction of an initial 2020 ALSLR Plan is presented below to provide an example of how the predictive model will be used to help plan the work; the example below incorporates the estimated ALSLR and LSL Investigations in Table III.D-7 (to be updated per the LSI). In general, the Geographic Area defined by Group A (known lead) is expected to have higher per day of LSLR rates resulting from

minimal effort for mobilization/demobilization while Individual LSLRs will have a lower LSL replacement rate as the result of greater need for mobilization/demobilization across an expanded geographic area. The ALSLR Plan will incorporate individual LSLR within the Geographic Areas when in close proximity.

The Geographic Area map below, in Figure III.D-A, integrates various prioritization and risk parameters to allow the criticality of geographic areas to be ranked; this in turn is used to determine the highest priority areas to plan for a given year ALSLRs 7.0% inventory to be addressed.

Figure III.D-A. Geographic Area and Individuals Map Visual Representation

An example of individual LSLRs from Group A (known lead) are shown above in Figure III.D-A. As an example, the red, orange, and green dots reflect known lead, suspect lead, and possible lead service lines, respectively. The area highlighted on the map has a higher concentration of focus properties as represented in Figure III.D-A. These properties are individual LSL properties that reflects the highest risk from the prioritization using the consequence risk parameter analysis that may not be in highly concentrated geographic areas. A separate ALSLR strategy is developed for Denver Water to mobilize LSL replacement crews to address these high-risk individual properties (outside of the highlighted area) since the level of effort and s will not be comparable to LSLRs in the Geographic Area model. However, the impact of replacing these Individual LSLs is just as important in terms of public health.

A prioritization parameter, for both Groups A and B, is municipal (infrastructure) project data (i.e., planned project locations and times) which is used to aid in determining key areas to perform work, whether it's pavement restoration or water main replacement. Incorporating these municipal projects into the ALSLR work is key because of the ability to reduce disturbances to Property Owner's, reduce project costs, and facilitate service line material investigations. The extent of municipal project data used in prioritizing properties is still in its preliminary stages.

Accelerated Lead Service Line Replacement Plan

Denver Water Lead Service Line Standards

Denver Water has years of experience executing LSLRs both as part of water main replacement projects as well as at individual properties. DW plans to utilize their existing lead service line replacement design standards to act as a guideline for LSL replacement process completed under the ALSLR Plan. The DW LSL standards state that lead service lines shall be replaced with copper service lines, provided that DW is given consent by property owners. DW goal under the ALSLR Plan is to replace all non-copper (lead or galvanized downstream of lead) service lines from the water main to the first fitting inside the residents dwelling. The ALSLR Plan goal is to replace LSLs at a cumulative average replacement rate of 7.0% throughout the 15-year program.

To achieve this goal, the ALSLR Plan will require close coordination among the Filter Program, Approvals/Permits, COE Plan activities, LSI and predictive modeling tasks, and the various stakeholders during the full life-cycle of the LSLR process. Denver Water's continued proactive approach to LSLR will require activities to be closely coordinated during three phases of the LSLR: Pre-Construction Phase, Construction Phase, and Post-Construction Phase. ***The overviews, objectives, and metrics are only preliminary and will be updated in future ALSLR Plan versions. The draft ALSLR Plan begins to establish a framework for possible interaction among the various LRP components and is ONLY PRELIMINARY at this time.***

ALSLR Pre-Construction Phase

The Pre-Construction Phase uses the predictive model's bi-annual identification of Group A and B LSL replacements and investigation of properties (see Table III.D-8), based on the hierarchical approach described earlier. These properties classified in Group A and B categories will be the focus of the ALSLR. The properties included in Group A are to be replaced in the given year based on a geographic or individual approach. The Group B properties are scheduled for investigation of the service line material type in a given year. The investigation process will require potholing and/or water sampling to determine the expected material type of the service line. If any part of the service line material is verified as lead, the properties service line information will be updated in the LSI. The properties will be allocated to the appropriate ALSLR Group for replacement in the future. If the service line material is verified as copper, then the service line information will be updated in the LSI, and the properties will be removed from the LSLR list. The property information will be used by DW to obtain the necessary permits and approvals from the respective agencies to conduct LSL replacements. The COE Plan describes how to inform property owner (and residents, if different) of the upcoming LSL replacement. Concurrently, the Filter Program will coordinate with the resident(s) to ensure the filter devices are made available and being used.

Denver Water's current LSLR program has a standard communication timeline. The DW timeline illustrates the responsible parties and specific times before, during, and after construction when Denver Water staff must contact Property Owners. The Denver Water communications outline for LSL replacement (see Figure III.D-C) will act as the foundation with updates as necessary for the larger Denver Water ALSLR Pre-/Post-Construction Property Owner Communication Timeline.

Trained program staff will distribute and collect signed Resident Consent forms to perform LSL replacement, and conduct with consenting residents a detailed explanation of the work to be performed and address any questions residents may have. A LSLR Contractor will then proceed to verify the service line material prior to starting LSLR work. Pre-Construction activities are designed to enhance the LSLR rates through earlier identification of lead services at properties with unknown service materials. Furthermore, Denver Water will document pre-construction conditions (exterior and interior) for all properties consenting to LSL replacement.

In summary, this delivery process with the associated plans overview, objectives, and metrics being measured are described in Table III.D-9 and are intended to lay the ground work for successful LSL replacement through close collaborations with all LRP elements.

Table III.D-8. LSLR Contracting Groups Summary

LSLR Groups	Descriptions
Group A (Known Lead) - Geographic LSL Replacement Area	**Block by Block or Street by Street** - Confirm service line material and replacement of LSLs on Blocks or Streets. These are LSL replacements that are confirmed to have a partial- or full-lead. High priority properties will be integrated via the prioritization model. For more details, see the Appendix III.B.3 *Predictive Model and Prioritization*.
	Water main Replacement - Confirm service line material and replace LSLs concurrently with water main replacement projects.
	Municipal/Transportation/Pavement Improvements - Confirm service line material and replace LSLs in coordination with Municipal, Transportation, and/or Pavement improvement projects.
Group A (Known Lead) - Individual LSL Replacement	**Individual and High Priority** - Confirm service line material and replace LSLs for properties providing water to day-cares, schools, nursing, jails, dialysis and critical customer facilities. Properties are known to have high lead concentrations (> 15 ppb) and consequence (depending on risk factors).
	Redevelopment and Scrape Offs - Confirm service line material and remove existing LSLs. Developer to install new service line and tap.
	Leaks - Confirm service line material and replace LSLs jointly with Denver Water's service leak repair projects.
Group B (Suspected or Possible Lead) - LSL Investigation	**Investigation** – Potholing and/or water sampling LSL inventory with a relatively high probability of lead classification (possible or suspected, $p \geq 0.5$). Work is to be performed separately from LSL replacement contracts. Intent is to verify if service lines are lead or non-lead.
	Declined Consent Investigation – If Resident Consent is declined, the service line material to be verified will be listed in the LSI as not verified and placed on a list of non-consenters and supplied to Denver Water legal department. (TBD per Approved Non-Consenter Policy)

Figure III.D-C. Denver Water's Communications Outline for LSL Replacement (NEED CONFIRMATION)

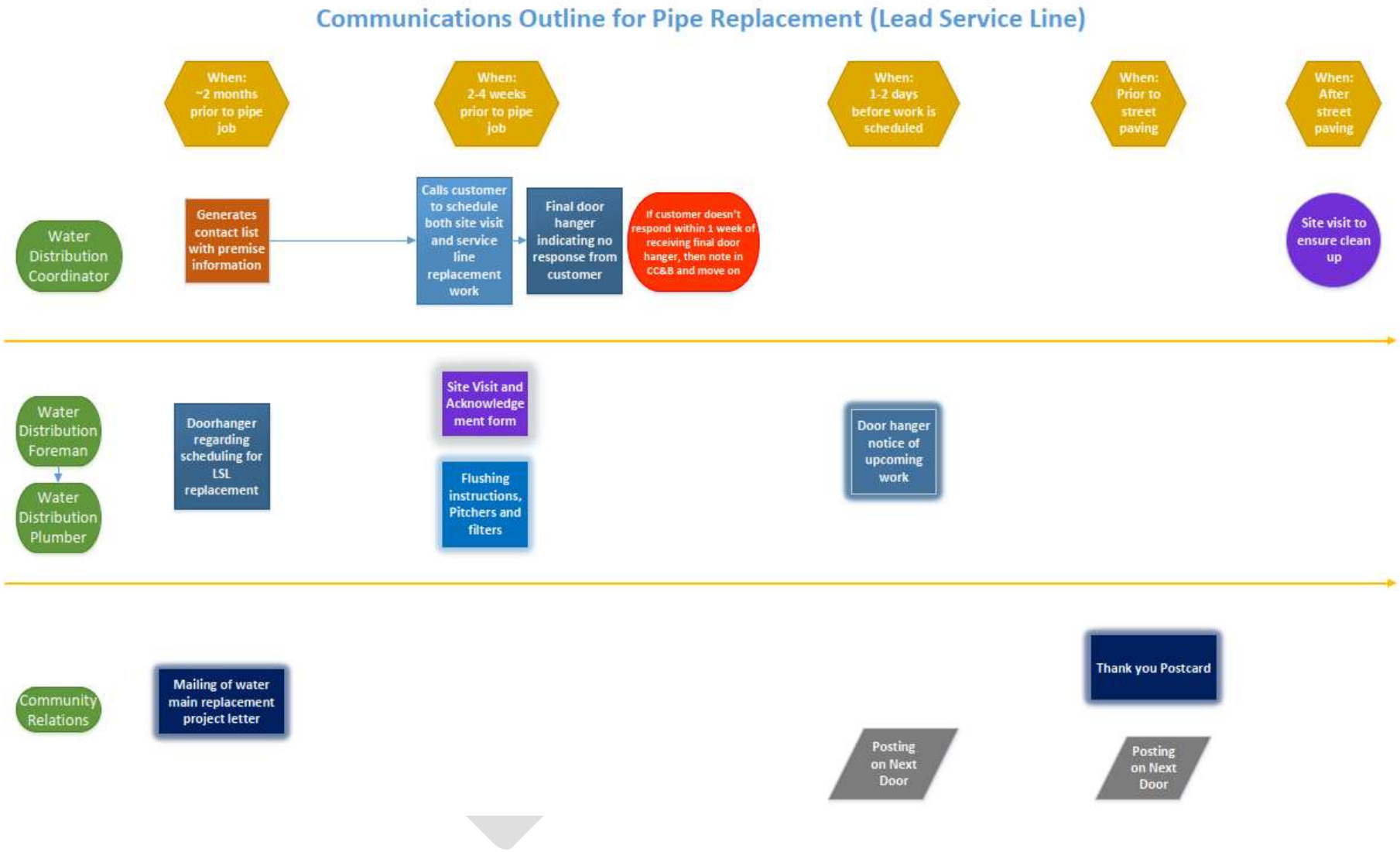


Table III.D-9. LSLR Pre-Construction Components

PREDICTIVE MODEL	APPROVALS / PERMITS (TO BE CONFIRMED IN NEXT VERSION WITH RESPECTIVE RESPONSIBLE TEAM)	COE ALSLR PLAN (TO BE CONFIRMED IN NEXT VERSION WITH RESPECTIVE RESPONSIBLE TEAM)
OVERVIEW		
The predictive model uses the lead service line inventory to annually plan the works schedule for Group A (Geographic and Individual LSLRs) and Group B (LSL Investigations) using a hierarchical approach as described above in Table III.D-8. The Group B properties will consider field investigation results.	Obtain the necessary approvals, permits, and documentation prior to ALSLR work, including local governments, property owners and residents with a known, suspected, or possible LSL. The Resident Consent Form is an important approval and the protocol to engage the property owner and resident is described in the COE Plan. (Specific Permits and approvals currently being confirmed)	The COE ALSLR Plan will engage public stakeholders and residents in seeking customer/resident approvals to move forward with LSLR. Program representatives will work closely with all public stakeholders and residents/customers to perform the necessary COE activities. The COE Plan describes up to three touch points with residents to confirm and obtain Resident Consent Form Approval. The steps below need to be confirmed with the COE Plan
OBJECTIVES		

• Define annual ALSLR Plan.
• Categorize replacements into ALSLR work groups: Investigation (green), Per Area (blue), and Individual (orange)
• ALSLR work groups will act as the basis for Contracts
  ○ *Per Geographic Area* will be completed in a Block by Block or Street by Street manner.
  ○ *Individual* will include single LSLs in non-concentrated area and locations at properties determined to be of high lead potential and consequence.
  ○ *Investigation* will classify services based on likelihood (suspected or possible) that line is lead that requires confirmation.
• Improve calibration of the predictive model as service line materials are confirmed; update predictive model twice a year.
• Maintain independent LSL Investigation Contracts to support year-over-year planning by eliminating uncertainty of lead service line materials.
  ○ If service line is verified (potholed) to be lead, after Property Owner consent is received, it will be re-allocated to the appropriate ALSLR work group.
  ○ If Property Owner consent for investigation is declined, the service line material to be verified will be listed in the LSI as not verified and placed on a list of non-consenters and supplied to Denver Water legal department. ((TBD per Approved Non-Consenter Policy)
	• **XX** Weeks/Days Prior to Construction (timing to be confirmed):
	  ○ Apply for necessary permits (CC&B, Municipality Traffic Control Plan, Tree Protection, Stormwater Permit, Stormwater Management Plan, Dewatering Permit, Sewer Discharge Permit, Street Restoration Plan, Street/Occupancy Permit, and Regional Building Permit).
	  Note: *Estimate of the permits needed, will vary by geographic location of service line replacements.*
	• **XX** Weeks/Days Prior to Construction:
	  ○ Program distributes door hanger information and Resident Consent forms for the LSL replacement work.
	  ○ Program schedules a coordination meeting with property owners and answers any questions.
	• **XX** Weeks/Days Prior to Construction:
	  ○ Program holds a coordination meeting with property owners, performs a pre-construction site inspection, and determines the tie-in location of service line.
	• **XX** Weeks/Days Prior to Construction:
	  ○ Contractor will contact Denver Water Sales Administrators to schedule a water main tap and survey the property for utilities.
	  ○ Contract must verify any conflicts noted during utility survey prior to LSLR.
	• **XX** Weeks/Days Prior to Construction:
	  ○ Program will follow-up with any non-responsive property owners to obtain consent to perform the LSLR.
	  ○ If consent is declined by property owner, Denver Water will follow non-consent procedure **(REFERENCE PROCEDURE FOR NON-CONSENTERS)**.
		• 45-Days Prior to ALSLR Construction (timing to be confirmed):
		  ○ Mail LSL replacement project letters and consent form to the property owners (in their first language).
		• **XX** Weeks/Days Prior to Construction:
		  ○ Follow-up with property owners to address any uncertainty about the upcoming work and confirm they have signed the Resident Consent Form.
		• **XX** Weeks/Days Prior to Construction:
		  ○ Provide 24-hour water outage notice in advance of LSL replacement.

METRICS		
The metric is to replace 7.0% of the LSL inventory each year, based on a three-year running annual average. Report performance by Group A and B, Geographic and Individual, and Group B Investigations.	The metric is to obtain Approvals and Permits to achieve a confirmed ALSLR with a backlog of **XX** Weeks/Days of approved Resident Consent Forms.	The metrics to assess performance are included in the COE Plan.

TABLE III.D-9. LSLR Pre-Construction Components (Continued)

FILTER PROGRAM (TO BE CONFIRMED IN NEXT VERSION WITH RESPECTIVE RESPONSIBLE TEAM)	ALSLR PLAN
OVERVIEW	
Customers will be supplied educational materials describing the LRP in general and the upcoming planned ALSLR work in their neighborhood or at their property.	Activities will include confirmation that the Contractor has obtained the necessary approvals and permits, has all equipment and materials mobilized to the site, and is ready to commence with the ALSLR.
OBJECTIVES	
• **XX** Weeks/Days Prior to Replacement: ○ Denver Water distributes additional NSF certified filters to remove lead, if required, during the property owner coordination meeting. • Denver Water to reinforce the message of continued use of the filters that are NSF certified to remove lead through six (6) months following LSLR. • For properties where consent for the LSLR is not earned, the property will be placed on a list for follow-up and CDPHE notified.	• Contractor mobilization is complete and necessary plans, permits, and approvals are in place. • Safety Plans are in-place and Crews are briefed. • COE and Filter Plans have been reviewed. • Proactively obtain Resident Consent forms. • Contractor staff trained on how to engage with the public, who to contact for help, how to safely enter a property, etc.
METRICS	
• The metric to assess performance is confirmation of NSF certified filter (for lead removal) replacement cartridge distribution.	The metric to assess performance is to maintain a 12-month rolling 7.0% backlog and/or inventory of candidate properties for LSLR.

ALSLR Construction Phase

Once the Pre-Construction Phase activities have been addressed, the ALSLR Contractor will proceed to replace LSLs per the contracting model (see Table III.D-8). The Construction Phase focus is to replace lead service lines that are known or have gone through an investigation process that has confirmed the presence of lead service lines and/or galvanized downstream of lead. The investigation process is conducted using the progressively calibrated predicative model. Based on the determination, the Program will actively work with property owners to replace the lead service based on Property Owner/Customer approval of the Resident Consent Form. The different possible insitu lead service line configurations are shown in Figure III.D-D.

Denver Water will use the configurations of Figure III.D-D to document the level of LSLR and report the LSLR credit toward the total number of replacements completed each year. In addition to the full replacements illustrated in Figure III.D-D, Denver Water may have a unique scenario that requires only partial LSLR. When Denver Water replaces water mains, the existing service line will need to be transferred from the old water main to the new water main. This LSLR activity provides Denver Water the opportunity to replace Property Owners service lines. If the existing service line at the water main is identified as lead, Denver Water will request resident consent to investigate the service line's material up to the first fitting inside the dwelling. However, if the property owner does not consent to having their lead service line replaced, Denver Water will only replace the LSL up to the meter regardless of the service line material from the meter to the first fitting inside the dwelling. This will be considered a partial replacement, which contributes to the cumulative annual average 7.0% LSLR.

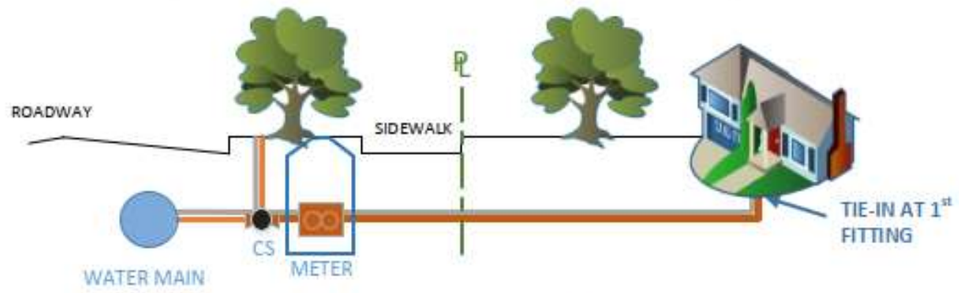
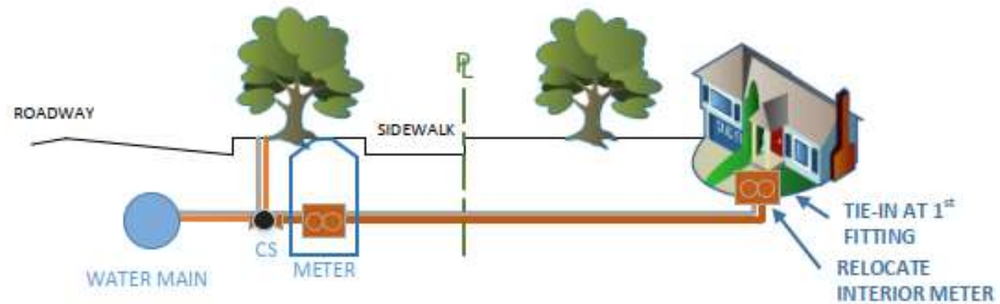
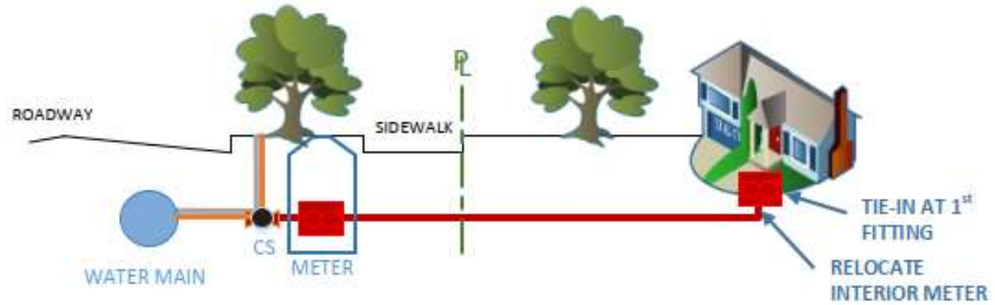
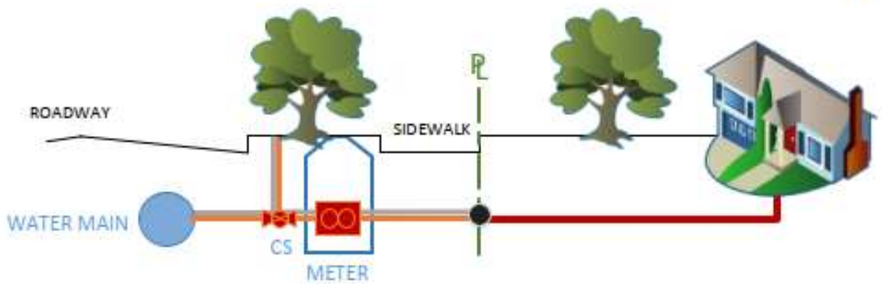
During construction, Denver Water's Construction Inspectors (CIs) will provide field quality assurance and quality control (QA/QC) oversight for the work being performed by contractors to ensure

compliance with the Contract Documents and Specifications. LSL replacement work will be overseen in the field by CIs; and the Project Engineers will review the LSL replacement data submitted, by the CI or Contractor, based on the work completed in the field. The Project Engineers will review the LSL replacement data or any reports, to ensure it is correct, before including it into the LSI database for use by the Predictive Model.

ALSLR Post Construction Phase

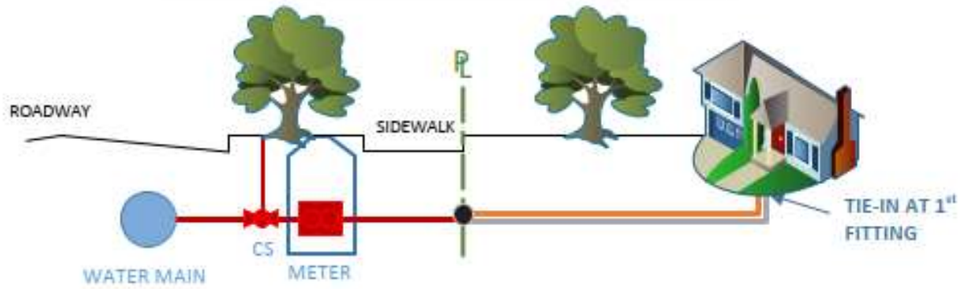
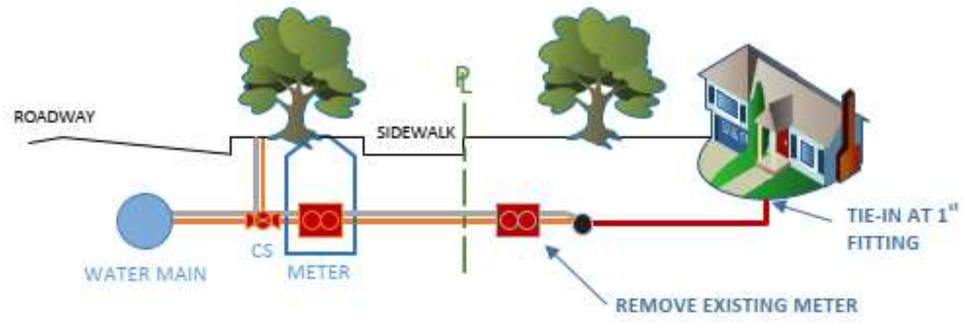
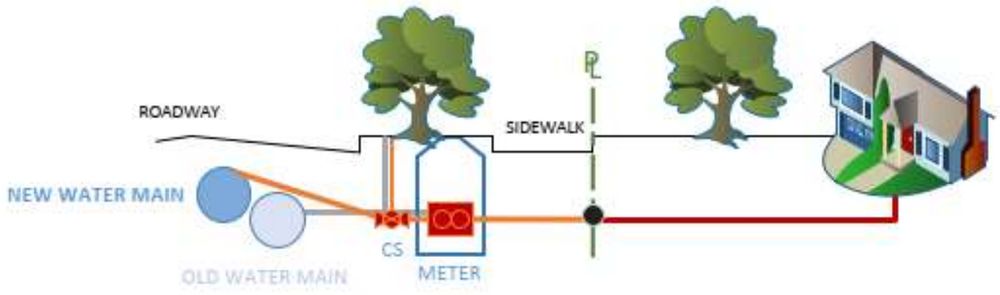
Once the LSLR has been completed through the Construction Phase, the ALSLR will move forward to the Post-Construction activities to ensure the new copper service line is ready for use per AWWA/ANSI Standard C810-17 (Standard C810-17) for Replacement and Flushing of Lead Service Lines. Upon completion of the flushing procedures and water quality testing, the property's results of LSL replacement will be recorded and stored in the appropriate data management system. The Post-Construction Phase activities are further highlighted in Table III.D-10 for each component of the LRP.

Figure III.D-D. [Provisional, Subject to Change] Non-Copper Service Line Replacement Scenarios

SCENARIO TYPES	SCENARIO ILLUSTRATIONS	SCENARIO DESCRIPTIONS
Full LSLR with Exterior Meter		1. Replace lead service line (LSL) from the water main to the 1st fitting inside the building with copper. 2. Install new tap on water main. 3. Install a new meter and meter box in the Public Right Of Way (ROW). 4. Remove and install new curb stop (CS).
Full LSLR with Interior Meter		1. Replace lead service line (LSL) from the water main to the 1st fitting inside the building with copper. 2. Install new tap on water main. 3. Relocate the existing meter from inside the building. Install a new meter and meter box in the Public Right Of Way (ROW). 4. Remove and install new curb stop (CS).
LSLR at Curb Stop with Interior Meter Relocation		1. Replace lead service line (LSL) from the water main to the curb stop. 2. Install new tap on water main. 3. Relocate the existing meter from inside the building. Install a new meter and meter box in the Public Right Of Way (ROW). 4. Remove and install new curb stop (CS).
LSLR in Public ROW with Exterior Meter		1. Replace LSL from the water main to the property line with copper. 2. Install new tap on water main. 3. Remove and install a new meter and meter box in the Public ROW. 4. Remove and install new CS

LEGEND: EXTENT OF EXISTING LEAD OR GALVANIZED DOWNSTREAM OF LEAD — EXTENT OF EXISTING COPPER — EXTENT OF REPLACED COPPER — TIE-IN TO NON-COPPER EXISTING SERVICE

Figure III.D-D. [Provisional, Subject to Change] Non-Copper Service Line Replacement Scenarios (Continued)

SCENARIO TYPES	SCENARIO ILLUSTRATIONS	SCENARIO DESCRIPTIONS
LSLR with Lead Service on Private Property		1. Replace LSL from the water main to the property line with copper. 2. Install new tap on water main. 3. Remove and install a new meter and meter box in the Public ROW. 4. Remove and install new CS
LSLR on Public and Private Property with Exterior Meter Relocation		1. Replace LSL from the water main to the 1st fitting inside the building with copper. 2. Install new tap on water main. 3. Remove and install a new meter and meter box in the Public ROW. 4. Remove and install new CS.
Water Main Replacement without Consent		**Consent not given by Property Owner to replace LSL during Water main Replacement Project:** 1. Replace LSL from old water main to the meter. 2. Install tap on new water main. 3. Remove meter and install new meter with copper service line. 4. Remove and install new CS. 5. Inform Property Owner that non-consent will result in a Lien on the Property's Title.

LEGEND: EXTENT OF EXISTING LEAD OR GALVANIZED DOWNSTREAM OF LEAD — EXTENT OF EXISTING COPPER — EXTENT OF REPLACED COPPER — TIE-IN TO NON-COPPER EXISTING SERVICE

Table III.D-10. ALSLR Post-Construction Components

PREDICTIVE MODEL	APPROVALS / PERMITS (TO BE CONFIRMED IN NEXT VERSION WITH RESPECTIVE RESPONSIBLE TEAM)	COE PLAN (TO BE CONFIRMED IN NEXT VERSION WITH RESPECTIVE RESPONSIBLE TEAM)	FILTER PROGRAM (TO BE CONFIRMED IN NEXT VERSION WITH RESPECTIVE RESPONSIBLE TEAM)	ALSLR PLAN
OVERVIEW				
The LSI will be updated with ALSLR information to reflect progress to refine the Predictive Model.	The approvals and permits must be closed out, once Group A - Geographic Area is complete.	Program team will notify the property owner of the water quality sample results and provide additional support as needed after the LSL replacement.	The Filter Program does not end with LSL replacement, Denver Water will deliver to the Property Owners the necessary information and materials to conduct a property plumbing flush and how to obtain a water quality sample.	Property Owners (Residents) will receive a new copper service line and restoration is completed.
OBJECTIVES				
• The LSI database will be updated through ongoing reporting and provide the Predictive Model the necessary information to develop the annual LSLR program. • The LSLR crew rates will be documented to demonstrate the replacement rate of crews in the periodic LSLR progress reports. • Current year LSL replacements will be monitored to confirm Denver Water is meeting the annual 7.0% target.	• Once water service has been returned to the property owner, the Program will schedule restoration work to be completed on the property. • Provide list of properties where consent is denied to DW legal department and CDPHE for follow-up. • Place/designate non-consent residents into Denver Water LSL inventory as noted for future follow-up.	• Program team to provide education materials to describe how and when to flush the home by the resident. • Program team to distribute water quality sampling kit, four (4) months after the LSL replacement. • Program team will inform the property owners of the water quality sample results for the four (4) month post replacement sample. • If water quality sample test result reveals lead levels above **XX** ppb, the Program team will reach out to the property owner to provide additional education materials on how to identify potential sources of lead within the dwelling (plumbing), provide information on additional mitigation measures, and contact information for Community Organizations.	• Program team will communicate with the property owner with handouts to ensure the property owners understands the flushing and sampling programs that will be required post-construction. • Program team will continue to supply filter cartridges that are NSF certified to remove lead, as needed, up through six-months following the LSLR.	• Program team to perform 15-minute service line flush immediately after replacement. • Contractor commences restoration of the Resident's property to its pre-construction condition, which will be based on documentation obtained prior to construction. • Any non-salvageable materials generated from construction will be disposed of in accordance with the local regulations. • CI completes post-construction documentation (videos/photographs) of all areas restored.
METRICS				
• Improve the LSI of suspected and possible lead service lines through investigation. • 7.0% of LSLs are removed each year from the overall total of LSLs identified.	• No outstanding Permits with municipalities. • Inspection approvals are received.	• Timely reporting of post-replacement water quality sampling result.	• The metric of success is timely distribution of necessary replacement cartridges.	• Provide a Resident/Property Owner Feedback form.

ALSLR Contracting Strategy

Introduction

Denver Water and other third parties have been replacing approximately 1,200 LSLs over the last few years. To meet the 7.0% annual ALSLR rate, Denver Water will contract with outside resources for the additional LSLR crews as discussed above. The proposed contracting strategy is to seek qualified local contractors to support Denver Water LSLR crews to meet the 7.0% annual ALSLR rate. The procurement strategy must consider approaches to the three LSLR groups discussed in Table III.D-8: geographic area, individual LSL, and LSL investigations. Denver Water will strive through planned Industry Day events to inform the Denver Metro contracting community of the LRP's goals, objectives, and resource needs. Through Industry Days and a qualification-based selection process, Denver Water will proactively identify a shortlist of qualified ALSLR Contractors and the number of LSLR crews needed to meet the planned replacement rate. Denver Water will use a pre-qualification approach to select qualifying contractors from the qualified contractors list, request price bids that will be used in selecting the most responsive and lowest cost contractors that can either individually or collectively provide the needed ALSLR crews to support in accomplishing the 7.0% ALSLR rate.

Overview LSLR Contract Types and Goals

The different LSLR groups and contract types from Tables III.D-7 and III.D-8 will be categorized through the Predictive Model to guide the Program in the ALSLR planning and contracting strategy. Based on these LSLR groups and contract types, a rough order of magnitude (ROM) estimate was developed for the annual LSLR volume for each of the main LSLR Groups supported by each sub-group category as shown in Table III.D-11. The estimated annual LSLR targets were defined using present Denver Water replacement rates and those from other jurisdictions. The 2 LSLR crew replacement rate selected ensures Denver Water will achieve the goal of 5,250 LSLRs per year. Group A utilizes this replacement rate. Estimated annual LSLR volumes (with an asterisk) are determined from historical data, while LSLR volumes (with no asterisk) are estimated values assigned to each group type to meet the 7.0% cumulative average LSLR. The annual work days of 200 is used to determine the total number of annual LSLRs per group type. To maintain consistency with Table III.D-2, the estimated replacements per group type is set at 2 LSLRs per crew. The replacement rate used in the calculated volumes and rates consider production differences between LSLR crews per each group type due to the nature of the work. The difference in group type production efficiency is what attributes to the number of LSLRs per day minor differences. In summary, Denver Water will need approximately 13 ALSLR crews to achieve the 7.0% LSLR cumulative average. Scrape offs/Redevelopment Properties will be performed by their respective developers and hence, Denver Water will not be providing LSLR crews for this work. However, Denver Water through the collaboration with the City and County of Denver will define a SOP to work closely to monitor these activities and account for LSL being replaced.

Table III.D-11. ROM of Annual LSLR Volume Summary

LSLR Group Type		Est. Annual LSLR Completed	Est. LSLR/Day	Est. LSLR Crews	Pre-Const. Scope	Construction Scope	Post-Const. Scope
GROUP A - GEOGRAPHIC AREA	Water main Replacement	400	2.0	1	Coordinate, schedule w/ Denver Water, COE	Verify and Replace LSL	Filter, Flushing and Restoration Work
	Block by Block or Street by Street	3,000*	15.0	8	Permitting, COE	Verify and replace LSL	Flushing, Restoration Work
	Municipal Pavement and Road Improvement Programs	450*	2.25	1	Permitting, COE	Verify and Replace LSL	Filter, Flushing and Sampling, Restoration Work
	Total	3,850*	19.25	10			
GROUP A - INDIVIDUAL	Service Line Leaks	300	1.5	1	Permitting, Notifications	Leak Repair Verify and Replace LSL	Flushing, Restoration Work
	Individual & High Priority LSLR	600*	3.0	2	Permitting, Notifications	Verify and Replace LSL	Flushing, Restoration Work
	Scrape Offs and Redevelopment Properties	500	-	-	Permitting, Coordinate with Property	Replace or Remove LSL Based on New Use	Filter, Flushing and Sampling, Restoration Work
	Total	1,400*	4.5	3			
	Combined Total	5,250*	23.75	13			
GROUP B -INVESTIGATION	Field Investigations for areas expected or somewhat expected to have LSL	500*	5.0	1 - 2	Permitting, Notifications	Field Verify LSL	Restoration Work and Report Findings
	Water Quality Testing of areas expected or somewhat expected to have LSL	500*	-	-	Notifications	Obtain Water Quality of Property	Report Findings
	Total	1,000*	5.0	1 - 2			

(*) asterisk indicates the values are provisional and subject to change.
(-) hyphen indicates that these group types will be completed by internal DW crews.

As shown above, Denver Water's Preliminary 2020 ALSLR Plan estimates approximately 5,250 planned LSLRs and does not include the Group B investigation category since no LSLR will be conducted. Denver Water will use external contracted crews to staff up to 13 ALSLR crews to meet

the 7.0% cumulative average goal. The Group B, Investigation category has not been included in the total due to the difficulty determining the number of non-lead service lines that will be encountered. However, the investigation category has been established to assist Denver Water in better understanding the LSL inventory that has been identified, via water quality testing or investigation activities, in areas of their system that are defined in Group B – suspected and possible to contain LSL. As discussed in the LRP, where contractors are conducting investigations only, if copper service lines are found, the lead service line inventory will be updated to reflect the copper service and be incorporated into the 7.0% compliance count. Residents in the Filter Program, found to have a non-lead service line, will be removed from the Filter Program.

Contractor Performance

In late 2019, Denver Water plans to solicit and shortlist qualified Contractors to support the ALSLR Plan. Denver Water will be seeking to identify a minimum of 16 LSLR crews or more as needed to conduct the ALSLR work in 2020. Denver Water reviewed two types of ALSLR contracting strategies;

- **Option 1 - On a single-year basis** - request price bids from the shortlist of qualified contractors to obtain the necessary qualified crews prior to the following year (2020) ALSLR work. By awarding a finite quantity for each work type over a defined period, contractor performance can be monitored and if necessary, determine paths for improvement. This will allow Denver Water to reward the outperforming contractors with additional work during the contract period based on adjustments to their bid quantities and if necessary, unit price adjustments. The annual single year contract award will keep bid quantities and associated prices to a defined and manageable amount and scope. This will allow Denver Water the ability to manage the various aspects of the LSLRs and ensure the specific areas and needs are completed in a timely manner prior to moving to another location. This contracting process would repeat each year by soliciting price bids from the qualified shortlist. Under the multi-year contract, task orders would be issued to the selected contracts for approximately 200 properties to help in managing the annual ALSLR program and if needed, to make adjustment during the year.

- **Option 2 - On a multi-year basis** - request bids from the shortlist of qualified contractors to obtain the necessary qualified crews prior to the following year (2020) ALSLR work. Denver Water will award the first-year (2020) contract to the most responsive and low-price contractor(s). The multi-year contract would have a two or three-year extension clause that would allow for annual unit quantities and price adjustments. The option for the subsequent year's ALSLR work will be based on contractor performance: If ALSLR targets are not being met, the Contractor will be removed from the LRP. if it is determined that ALSLR targets are met, Contractors will be given the option to extend their contract for the next years' work after successful negotiations on their unit prices. The multi-year contracts will continue with maintaining/updating bid quantities and associated prices to a defined and manageable amount and scope. This will allow Denver Water the ability to manage the various aspects of the ALSLRs and ensure the geographic and individual LSLR areas and needs are being addressed in a timely manner prior to moving to another location. Under the multi-year contract, task orders would be issued to the selected contracts for approximately 200 properties to help in managing the annual ALSLR program and if needed, to make adjustment during the year.

Denver Water favors Option 2 because of the flexibility in contracting and reduction in administrative costs to repeat the annual contracting and bidding process if not warranted. In addition, this will allow Denver Water the opportunity to adjust bid schedule unit prices (increasing or decreasing) which reflect competitively priced field tasks. In addition, this option will incentivize Contractors to perform at a higher-level of production and quality while meeting the overall LSLR goals. The incentive clause will consider three primary objectives; safety, quality, and replacement rates. Furthermore, within the first 90 days, Denver Water will use lessons learned for improvement and adjustment to the overall ALSLR

process. This multi-year approach will allow Denver Water the opportunity to make Contract Document adjusts prior to subsequent years' work extensions or during the recomplete of new contracts.

Learn by Doing

Denver Water's business practice is founded on the philosophy of continual improvement and development as an organization. To that end, Denver Water will instill this philosophy through the Learn by Doing element of the LRP into the ALSLR Plan and the associated construction contracts. Bi-annually, the Learn by Doing approach will include Roundtable Partnership Meetings that will be conducted with ALSLR contractors to discuss and articulate lessons learned to promote greater safety, quality, LSLR crew efficiencies, and opportunities for improvement in all areas of the ALSLR Plan including being good neighbors in the community. The Learn by Doing approach will provide a sounding board for contractors to discuss opportunities for improvements that will help meet ALSLR objectives and provide a better understanding of issues that have arose during the year (see Table III.D-12 for proposed discussion topics).

Table III.D-12. Learn by Doing Meeting Schedule and Proposed Topics

Meeting Type (Month)	Key Topics Discussion Items
2nd Quarter Review	Safety Review, Communications (between Contractor-Denver Water and Contractor-Property Owner), Delays (Field Issues), Risks, Data Management (Submittal of information), LSLR Process (Best Practices), Other
4th Quarter Annual Review	Safety Review, Communication, approvals/permits, filter, Contracting (Resources), Procurement (Unit Pricing), Replacement Rates vs. Target, Improvements to Contract & Specifications, Restoration, Data Management, Risks Review, Other Risks and Items not previously identified, Other

ALSLR Regulatory Performance Criteria

The ALSLR Plan is required to meet the regulatory performance goal of 7.0% cumulative average replacement rate (state reference document). This goal will be closely monitored throughout the life of the LRP and if necessary, adjustments and/or corrective action taken. It is anticipated that the Group targeted ROM LSLR volume for each type of group and number of crew estimates will evolve during the 2020 implementation.

Procurement Strategy

Introduction

The ALSLR Plan contracting strategy will use Denver Water's procurement office to establish a standardized procurement process to notify and solicit qualifications and bids from outside contractors. To support this procurement process, Denver Water will provide a ALSLR Contract Document that includes standard front-end contract documents supported by technical specifications, supplemental specifications, and standard drawings for all components of the ALSLR work. The LSLR Contract Manual will contain the necessary bid forms that will govern the work to be conducted and payment for this work on a unit price basis. Denver Water will use three bid schedules based on the type of Groups identified above; Geographic, Individual, and Investigation.

Denver Water Purchasing utilizes the Rocky Mountain E-Purchasing System that helps to provide greater visibility to the contracting industry. The Rocky Mountain E-Purchasing System will be utilized as well as other notifications process for Industry Day, the subsequent Request for Qualifications (RFQ).

Denver Water promotes inclusiveness in their procurement process based on setting goals for Minority, Women, and Veterans owned businesses or Special Business Enterprise (SBE) and Minority Business Enterprises (MBE). To continue with best practices in the community and construction industry and to foster inclusion of qualified SBE's/MBE's, Denver Water will establish minimum goals for participation as a percent of construction dollars for construction contracts under the LRP.

ALSLR Contractor Procurement

Qualified Contractors who have been determined as most responsive and lowest price will be selected based on a task order format to focus on three LSLR Group areas: Geographic Area, Individual, and Investigations as further described below. The Plan may adjust the contracting and procurement strategy for this work as the ALSLR work evolves and specific or specialty work items are better identified that would warrant individualizing a specific scope of work outside of those already planned.

Lead Service Line Replacement Contractors will have a task order that defines scope of work (upwards of 200 properties) to replace lead service lines from the main to the first fitting within the dwelling and conduct restoration of disturbed areas. The LSL replacements scope will include from connection to the water main, meter box replacement (if not already located outside the property), curb stop replacement, and plumbing connections inside the resident home. ALSLR contractors will be expected to have excavation, boring, and plumbing capabilities to complete the replacements. Contractors will mobilize to one geographic area to replace multiple services in a given block, while others will replace individual lead service lines in high priority locations.

Investigation Contractors will have a task order scope of work to verify whether a lead service line exists ahead of the replacement crews. These contractors will be expected to use different methods of excavation, hand digging, potholing, meter box viewing, and interior dwelling investigation. Their productivity and ability to verify the presence of a LSL will help in better updating the LSI and calibration of the predictive model. By improving the LSI database, the predictive model will help in assuring task orders for various LSLR groups will assist in keeping the replacement contractors on schedule and achieve the annual ALSLR target. Construction Inspectors will report their findings to

the Program team so that the LSI can be updated, the prioritization model can be adjusted, and planning for replacement can be performed.

Scheduling and Coordination

To promote the LRP, ready the contracting community for ALSLR work, and gauge the interest of the contracting community, an open house (referred to as an Industry Day) will be planned for early August 2019. During the Industry Day, contractors will learn more about the LRP goals and expectations and Denver Water can also use this event as a forum to receive Construction Industry feedback. This will benefit not only potential bidders, but also the Program team in finalizing the contracting and procurement strategies. The dialogue from the Industry Day will be used to discuss unit price bidding options, clarify specifications, and aid in assigning risks within the construction contract document. The event will be advertised through the Rocky Mountain System BidNet, the Colorado Contractors Association, Denver Water's Public Information, and other appropriate channels. This event will be in advance of the formal qualification process so that the information gathered and shared can be used by Denver Water to develop the qualification package and contract documents.

A Request for Qualifications Process will follow the Industry Day to solicit specific information on relevant work experience, bonding, insurance, key staff, and overall capacity and approach. The qualifications packages will be evaluated and a short list of contractors will be developed. If needed, interviews can be conducted during this stage. Once the short list of contractors is developed, these contractors will be invited to a price bid on three bid forms; Group A – geographic, Group A – individual, and Group B - Investigations.

All Contractor Procurement Contract Documents are expected to be finalized by October 15, 2019 and to allow the bid process to move forward once the LRP variance is approved. The current timeline and milestones for the Procurement and Contracting of the ALSLR Plan are illustrated below in Table III.D-13.

Table III.D-13. Timeline and Milestones for Procurement and Contracting

Description	Estimated Timeframe
Industry Day Notification	After July 15, 2019
Industry Day	August 7, 2019
Request for Qualifications (RFQ) Notification	Mid-August 2019
Receive RFQ	Mid-September 2019
Shortlist Qualified Contractors	Early October 2019
Finalize Accelerated Lead Service Line Contractor Procurement Contract Documents	October 15, 2019
Request for Price Proposals (RFP)	TBD
Pre-Bid Meeting	TBD
Bid Opening	TBD
Bid Awards	TBD
Notification of Selected ALSLR Contractors (Multiple)	TBD
Finalize ALSLR 2020 Work Plan	TBD
Issue Task Orders	TBD
ALSLR Notice to Proceed	January 6, 2020

*DATES ARE PROVISIONAL AND SUBJECT TO CHANGE

Summary

Denver Water through a proven process will procure the needed qualified contractors for successful implementation and completion of the annual ALSLR Program. Denver Water is committed to providing the necessary resources in meeting the ALSLR goal of 7.0% cumulative annual replacement.