# INITIAL SERVICE LINE INVENTORY

SUFFICIENT EVIDENCE FOR NON-LEAD – TRAINING AID

To categorize pipe material as non-lead (e.g. copper), the water system is expected to show sufficient evidence using the options described below.

Note: For systems that own a portion of the service line, such as shown below, the pipe material for both the customer and system portions must be identified. The complete service line, which combines both portions, is assigned a category of non-lead, lead, galvanized requiring replacement, or unknown.
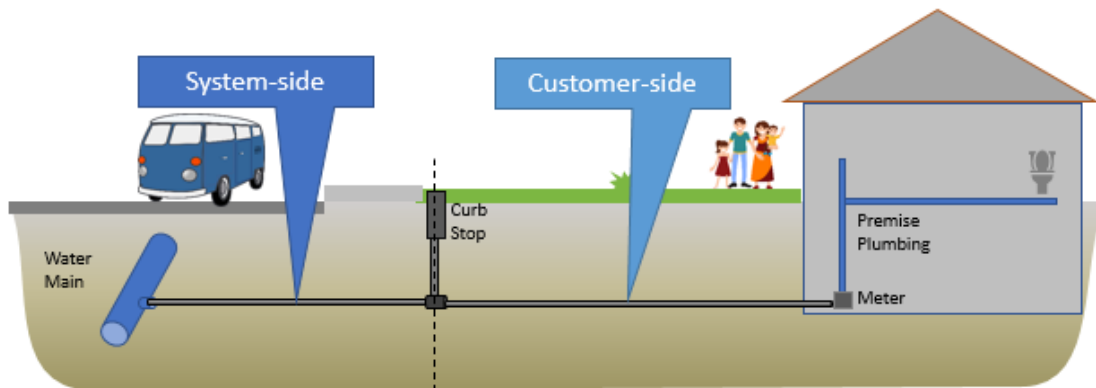
"Stand-Alone" <u>Records</u> Method Options: The following options do not need to be combined with another method to verify a pipe is non-lead:

- Records indicating service line installation/replacement date after January 6, 1991 (the effective date of the PA Lead Ban)
  -OR-
- Record of a local ordinance or plumbing codes prohibiting lead service line installation and water system records indicating service line installation/replacement after the ordinance effective date.

Methods to Verify Historical Records: If the water system has records that do not meet either of the stand-alone criteria above (e.g. tap cards showing a 1974 installation date), the system is expected to verify these historical records using <u>one</u> of the following investigation techniques:

a) Field verification, including any of the following options:
   o Visual inspection at existing access point for each portion of the service line being verified (i.e. customer-owned portion and/or system-owned portion). This includes any access points in which the material type can clearly be determined, such as a meter pit, or the service line entry to the basement at the customer side.
   o CCTV inspection outside pipe – at curb box
   o Mechanical excavation along each portion of the service line being investigated (i.e. customer-owned portion and/or system-owned portion). Any new excavations that the water system plans as part of the service line inventory investigation should be ≥ 18" from the curb stop.

b) Water quality sampling – targeted, flushed, or sequential (if the system **does not have corrosion control treatment**). Please review EPA Service Line Inventory Guidance pages 5-10 to 11 for information regarding sampling.

c) Modeling/Statistical analysis
   o A statistical analysis method includes the procedure established in the Michigan EGLE "Minimum Service Line Material Verification Requirements" document. A statistically sound subset of service lines can be field verified. This method should only be used for

a homogeneous area, such as a residential neighborhood in which the houses were built in the same time period.

d) Other method reviewed by DEP

Water systems without historical records of the pipe material: For a water system with joint ownership, the material of each portion of the service line is identified separately.

<u>Customer-side (typically longer portion) material identification:</u>
- Non-lead verification options include:
  a) **2 points of identification -** The system can combine any <u>two</u> of the following investigative techniques:
     - Visual observation of the pipe material entering the residence or observation in a meter pit
     - Excavation at 1 point (If not combined with another identification method, such as visual observation in the residence, excavation at 2 points is expected). Note: Any new excavations that the water system plans as part of the service line inventory investigation should be $\geq$18" from the curb stop.
  b) **Statistical analysis and/or modeling -** For statistical analysis, systems are expected to field investigate a single point at every location in a homogenous area (e.g. neighborhood) **and** field verify an additional point at a statistically representative percentage of the service lines in the same area.
  c) For systems <u>without</u> corrosion control treatment, combination of **water quality sampling** (targeted, flushed, or sequential) *and* **a field method from (a) above.** Please review <u>EPA Service Line Inventory Guidance</u> pages 5-10 to 11 for information regarding sampling.
  d) **Internal pipe CCTV inspection** if it is determined that the pipe material can be identified. Because of the disturbance to the internal pipe, systems should adhere to <u>risk mitigation measures</u> similar to the steps for lead service line replacement. Contact DEP for more information.

<u>System-side (typically shorter portion) material identification:</u>
- **Non-lead verification options include:**
  a) **Excavation at 1 point** (Note: Any new excavations that the water system plans as part of the service line inventory investigation should be $\geq$18" from the curb stop)
  b) **Statistical analysis and/or modeling -** For statistical analysis, systems are expected to field investigate a single point at every location in a homogenous area (e.g. neighborhood) **and** field verify an additional point, at a statistically representative percentage of the service lines in the same area.
  c) For systems <u>without</u> corrosion control treatment, combination of **water quality sampling** (targeted, flushed, or sequential) *and* **external pipe CCTV inspection** inside curb box. Please review <u>EPA Service Line Inventory Guidance</u> pages 5-10 to 11 for important information regarding sampling.
  d) **Internal pipe CCTV inspection** if it is determined that the pipe material can be identified. Because of the disturbance to the internal pipe, systems should adhere to <u>risk mitigation measures</u> similar to the steps for lead service line replacement. Contact DEP for more information.
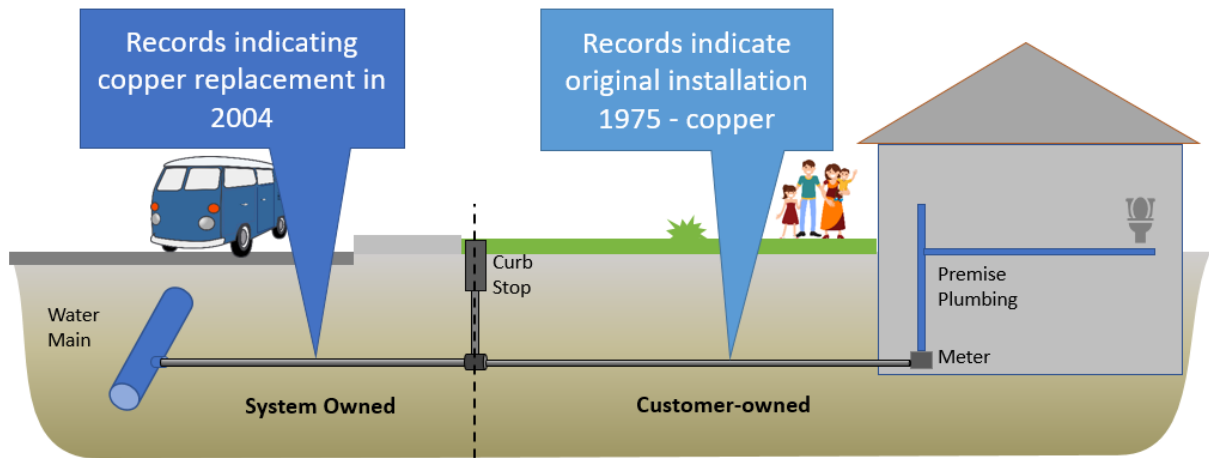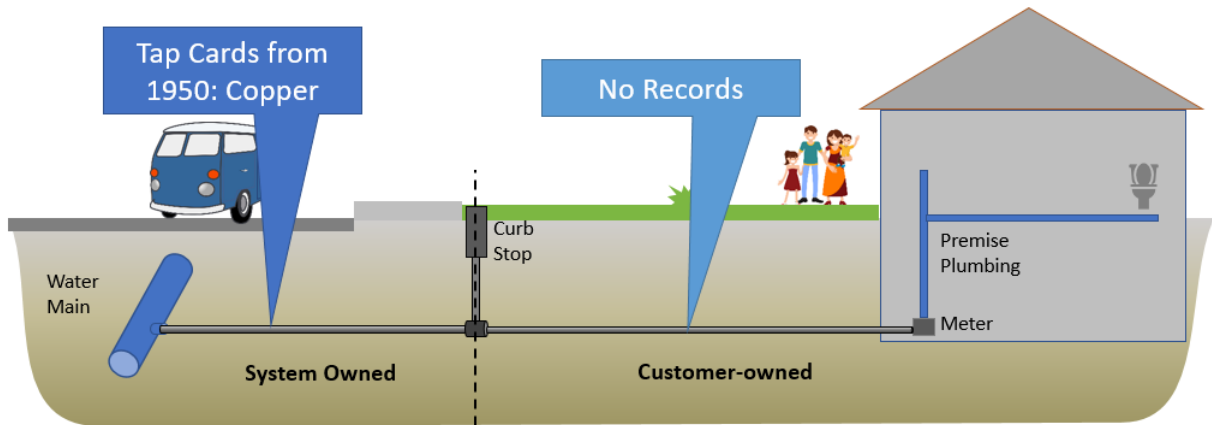
Non-lead Service Line Verification Examples

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Section 1: Systems with Corrosion Control Treatment

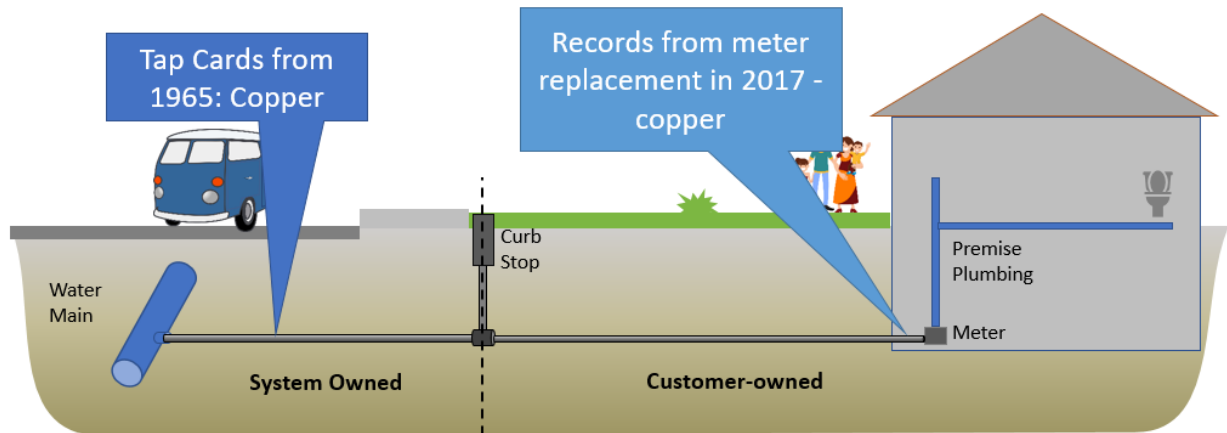## Example 1: Installation records for both sides

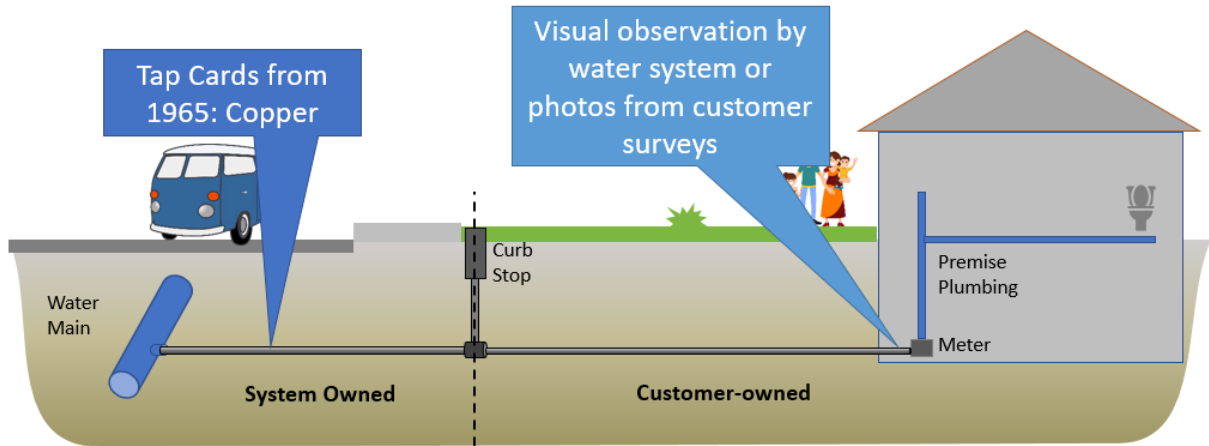|	System Side	Customer Side
System has:	Records for an area (e.g., neighborhood) indicating the system-owned side service line (SL) was replaced with copper in 2004 in conjunction with a main replacement program.	Records indicate service line installed in 1975 (copper) when the homes were built in this neighborhood.
Additional Actions Expected:	Nothing	Verify records since pre-'91 install. Choose one of the following: a) Visual observation of the material entering the residence b) 1-point excavation >18" from curb stop for each SL c) External pipe CCTV inside curb box for each SL d) Use statistical analysis and/or modeling: Field verify one point at a statistically representative percentage of the service lines for this area (e.g., neighborhood). Field verification can include a, b, or c above.

Example 2: Records for System-side only

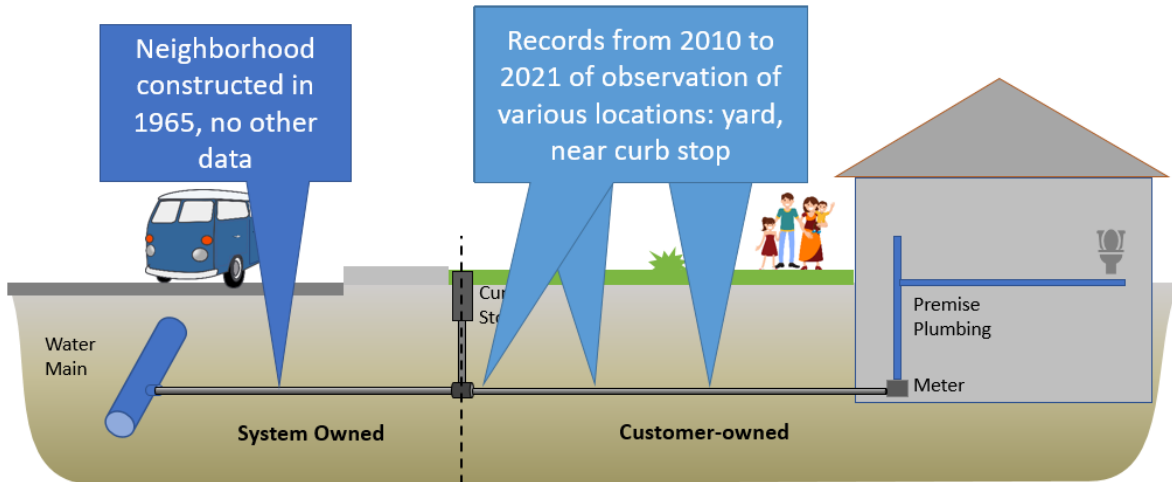|	**System Side**	**Customer Side**
System has:	Tap Cards from 1950 showing copper for an area of the system (e.g., neighborhood)	Nothing
Additional Actions Expected:	Verify record since it is pre-'91. Choose one of the following: a) 1-point excavation >18" from curb stop for each SL b) External pipe CCTV inside curb box for each SL c) Use statistical analysis and/or modeling: Field verify one point at a statistically representative percentage of the service lines for this area (e.g., neighborhood). Field verification can include a or b above.	Choose one of the following: a) 1-point excavation >18" from curb stop **and** visual observation of the material entering the residence for each SL b) 2-point excavation at each SL c) Statistical Analysis: *Example:* o Visual observation inside home prior to meter at *every* connection **combined with** a 1-point excavation >18" from the curb stop at a statistically representative percentage of the service lines for this area (e.g., neighborhood).

Example 3: Tap cards and meter replacement records

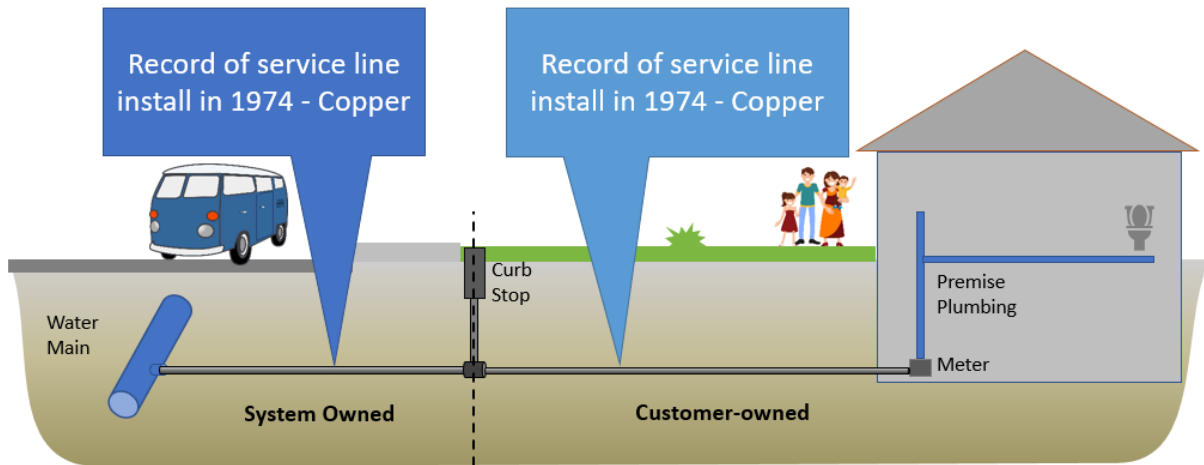|	**System Side**	**Customer Side**
System has:	Records from 1965 showing copper from main to curb stop (install records)	House built in 1965 but no records of SL material installed Records from meter replacements (in house) in 2017 showing connection to copper SL
Additional Actions Expected:	Verify record since it is pre '91. Choose one of the following: a) 1-point excavation >18" from curb stop for each SL b) External pipe CCTV inside curb box for each SL c) Use statistical analysis and/or modeling: Field verify one point at a statistically representative percentage of the service lines for this area (e.g., neighborhood). Field verification can include a or b above.	Verify record of SL material. Choose one of the following: a) 1-point excavation >18" from curb stop for each SL b) External pipe CCTV inside curb box c) Use statistical analysis and/or modeling: Field verify one point at a statistically representative percentage of the service lines for this area (e.g., neighborhood). Field verification can include a or b above.

Example 4: Tap cards and observation inside home

Tap Cards from 1965: Copper

Visual observation by water system or photos from customer surveys

Water Main

Curb Stop

System Owned

Customer-owned

Premise Plumbing

Meter

	System Side	Customer Side
System has:	Records from 1965 showing copper from main to curb stop (install records) for an area (e.g. neighborhood)	Visual observation in the house in addition to photos from customer surveys showing copper
Additional Actions Expected:	Verify record since it is pre '91. Choose one of the following: a) 1-point excavation >18" from curb stop for each SL b) External pipe CCTV inside curb box for each SL c) Use statistical analysis and/or modeling: Field verify one point at a statistically representative percentage of the service lines for this area (e.g., neighborhood). Field verification can include a or b above.	Should have a second point of verification on customer side. Choose one of the following: a) 1-point excavation >18" from curb stop for each SL b) External pipe CCTV inside curb box c) Use statistical analysis and/or modeling: Field verify one point at a statistically representative percentage of the service lines for this area (e.g., neighborhood). Field verification can include a or b above.

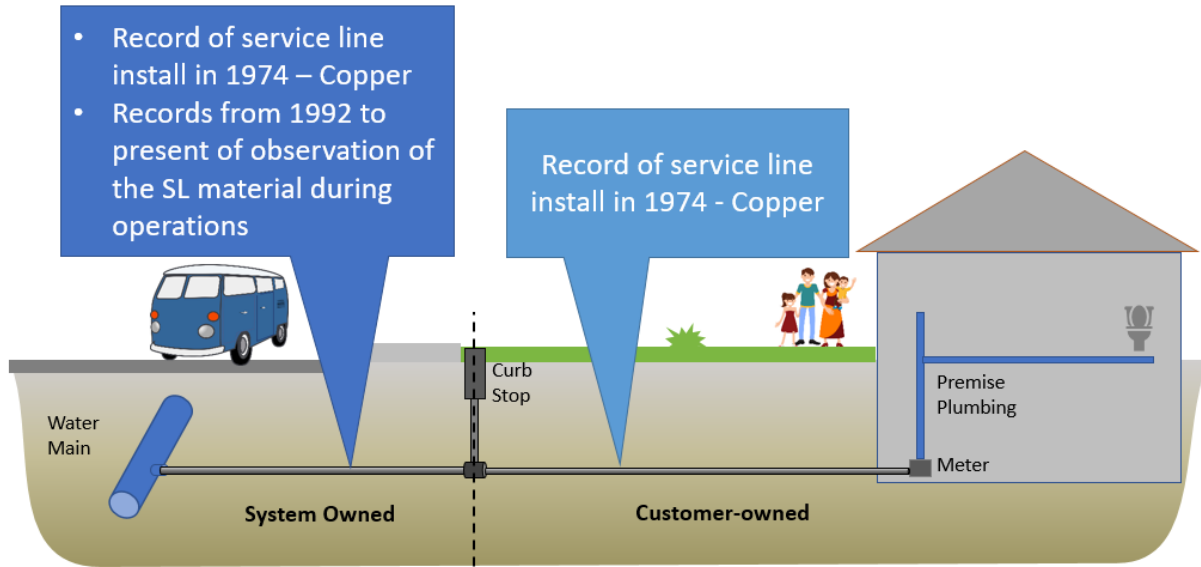## Example 5: Records of material observations during normal operations

	System Side	Customer Side
System has:	Record that neighborhood was constructed in 1965, no other data	Records from 2010 through 2021 of water system staff observations of copper SL material from various locations on customer side (e.g. along line in-yard and near curb-stop, but not necessarily >18" from the curb stop). These observations were made during normal operations and are not considered new investigations as part of the service line inventory.
Additional Actions Expected:	Choose one of the following: a) 1-point excavation >18" from curb stop at each SL b) Statistical Analysis - *Example:* o External pipe CCTV inside curb box at each SL **combined with** a 1-point excavation >18" from the curb stop at a statistically representative percentage of the service lines for this neighborhood.	Previous material observations along the customer side represent one point of verification and a second point is expected. Choose one of the following: a) Visual observation of the material entering the residence b) 1-point excavation at a location along the customer-side SL

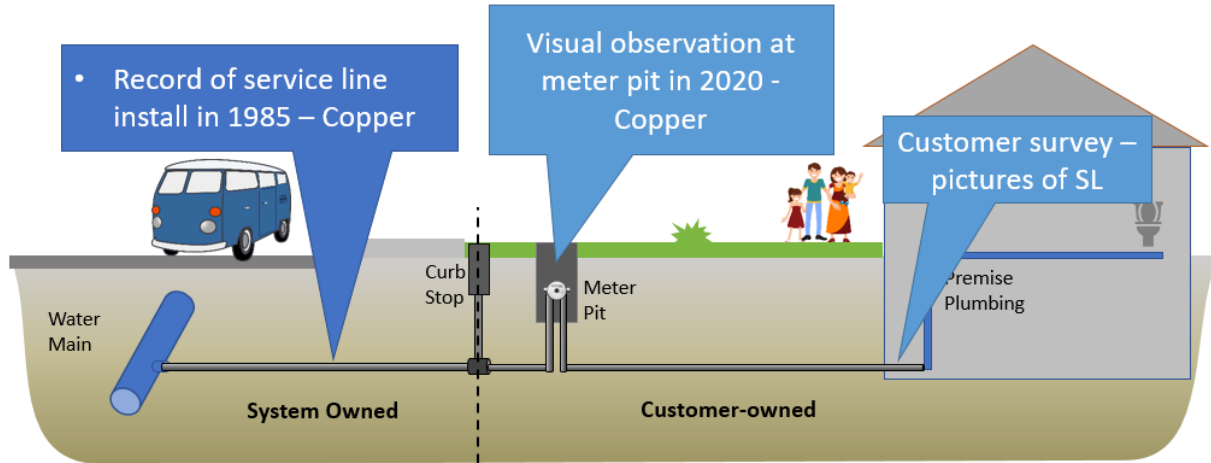## Example 6: Service line material records for both sides, pre-'91

	System Side	**Customer Side**
System has:	Record of service line install in 1974 for a neighborhood (Copper)	Record of service line install in 1974 for a neighborhood (Copper)
Additional Actions Expected:	Verify record since it is pre '91. Choose one of the following: a) 1-point excavation >18" from curb stop for each SL b) External pipe CCTV inside curb box for each SL c) Use statistical analysis and/or modeling: Field verify one point at a statistically representative percentage of the service lines for this area (e.g., neighborhood). Field verification can include a or b above.	Verify records since pre-'91 install. Choose one of the following: a) Visual observation of the material entering the residence b) 1-point excavation >18" from curb stop for each SL c) External pipe CCTV inside curb box for each SL d) Use statistical analysis and/or modeling: Field verify one point at a statistically representative percentage of the service lines for this area (e.g., neighborhood). Field verification can include a, b or c above.

Example 7: Installation and observation records

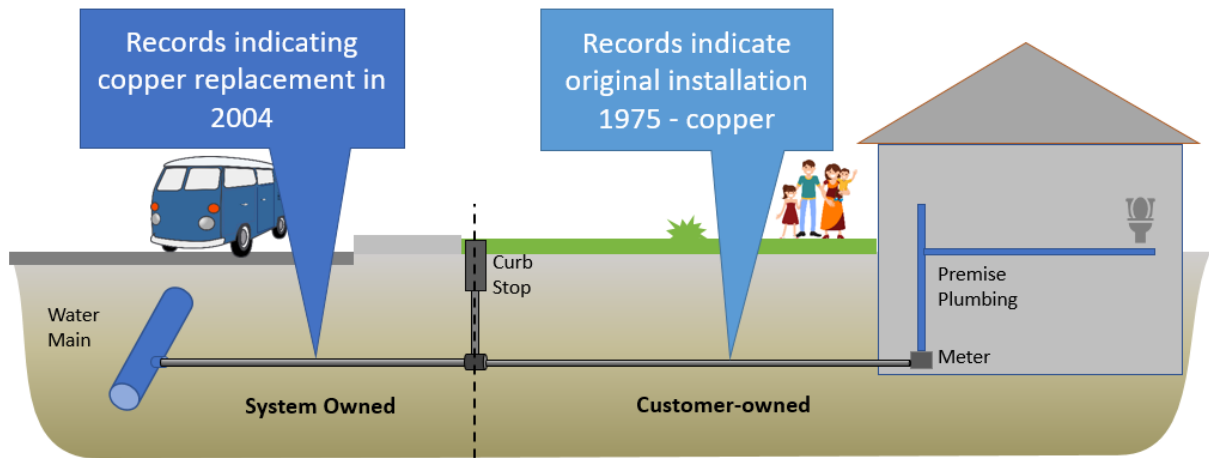|	System Side	Customer Side
System has:	Record of service line install in 1974 for a neighborhood (Copper) Water system records from 1992 to present of observation of the SL material during normal operations, such as line repairs, curb stop repairs, and main break repairs in which the SL could be observed.	Record of service line install in 1974 for a neighborhood (Copper)

Additional Actions Expected:	Water system should evaluate if these recent visual observations are statistically representative verification points for the applicable neighborhood(s) (e.g., 20% of homes).
	• If yes, additional action not required.
	• If no, then system should obtain additional verification points via one of the following:
	  a) 1-point excavation >18" from curb stop for each SL
	  b) External pipe CCTV inside curb box
	  c) Use statistical analysis and/or modeling: Field verify at a statistically representative percentage of SLs in this neighborhood. Field verification can include a or b above.
		Verify records since pre-'91 install. Choose one of the following:
		a) Visual observation of the material entering the residence
		b) 1-point excavation >18" from curb stop for each SL
		c) External pipe CCTV inside curb box for each SL
		d) Use statistical analysis and/or modeling: Field verify one point at a statistically representative percentage of the service lines for this area (e.g., neighborhood). Field verification can include a, b, or c above.

Example 8: Installation and Meter pit observation records

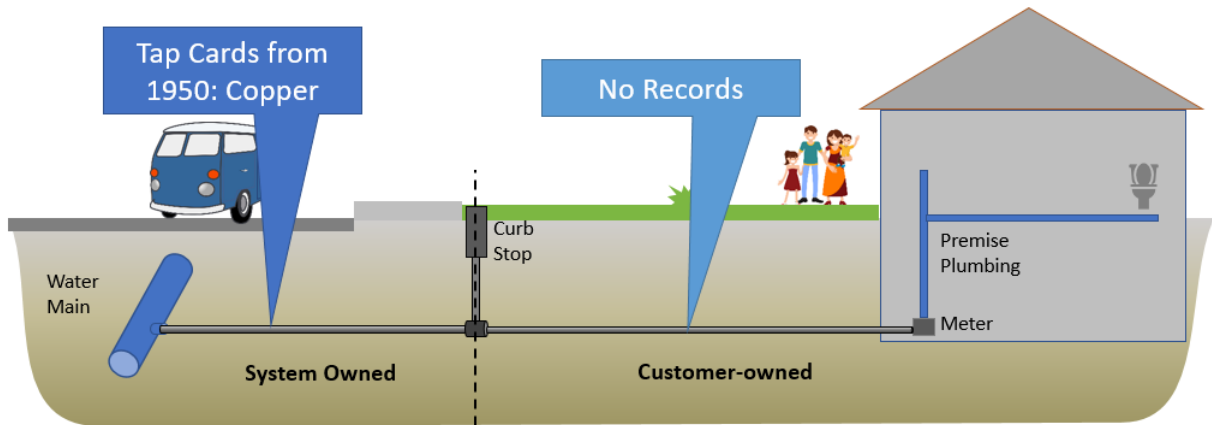|	System Side	Customer Side
System has:	Record of service line install in 1985 – Copper	Water system personnel visually observed copper SL in meter pit in 2020. Through customer outreach campaign, digital photo received from customer verifying copper entering the residence through foundation wall.
Additional Actions Expected:	Choose one of the following: a) 1-point excavation >18" from curb stop for each SL b) External pipe CCTV inside curb box for each SL c) Use statistical analysis and/or modeling: Field verify one point at a statistically representative percentage of the service lines for this area (e.g., neighborhood). Field verification can include a or b above.	None

Section 2. Systems *without* Corrosion Control Treatment

Example 9: Installation records for both sides

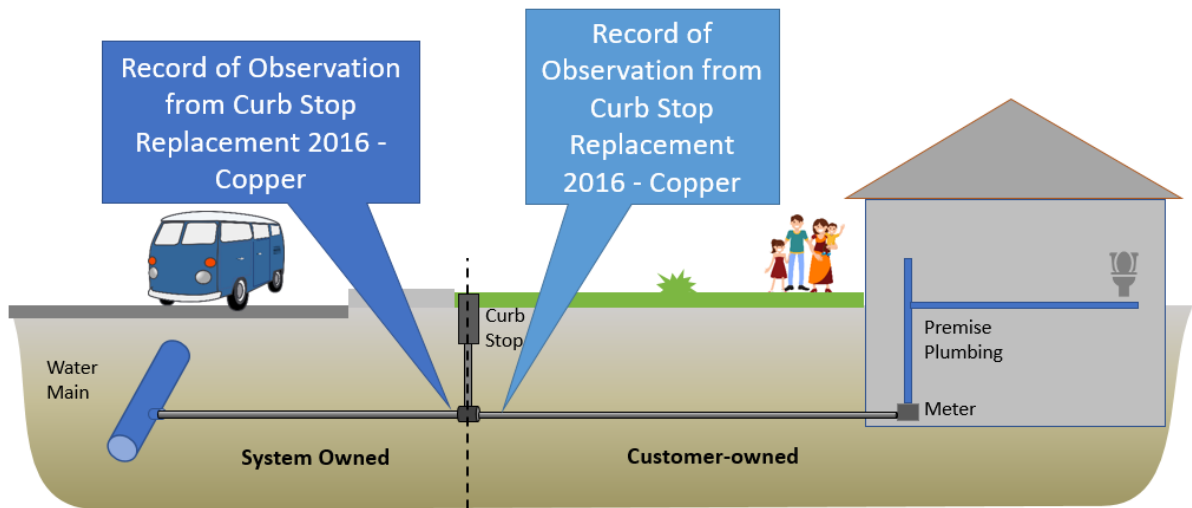|	**System Side**	**Customer Side**
System has:	Records for an area (e.g., neighborhood) indicating the system-owned side service line (SL) was replaced with copper in 2004 in conjunction with a main replacement program.	Records indicate service line installed in 1975 (copper) when the homes were built in this neighborhood.
Additional Actions Expected:	Nothing	Verify records since pre-'91 install. Choose one of the following: a) Visual observation of the material entering the residence b) 1-point excavation >18" from curb stop for each SL c) External pipe CCTV inside curb box for each SL d) Perform in-home water quality sampling (targeted, flushed, or sequential) e) Use statistical analysis and/or modeling: Field verify one point at a statistically representative percentage of the service lines for this area (e.g., neighborhood). Field verification can include a, b, c and above.

Example 10: Records for System-side only

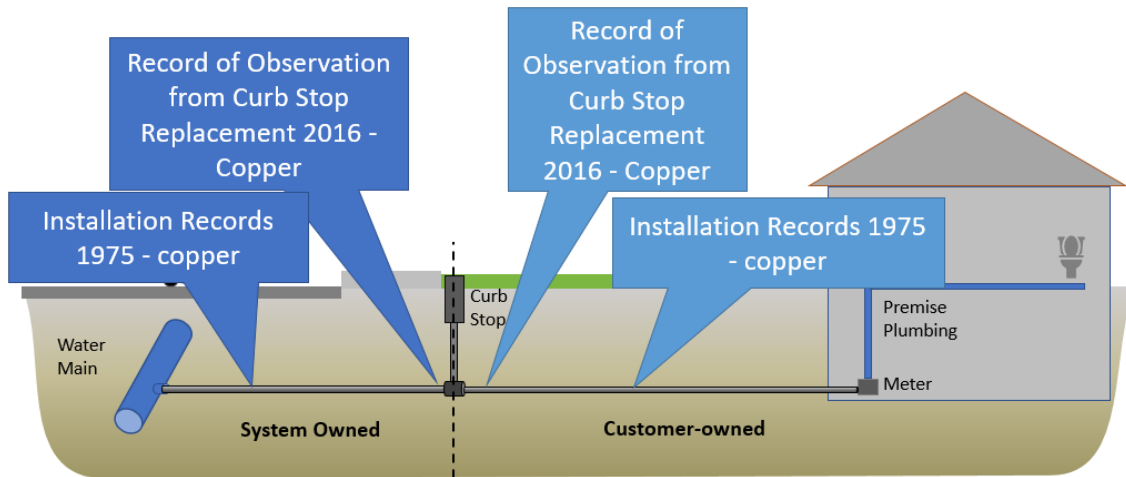|	System Side	Customer Side
System has:	Tap Cards from 1950 showing copper for an area of the system (e.g., neighborhood)	Nothing
Additional Actions Expected:	Verify record since it is pre '91. Choose one of the following: a) 1-point excavation >18" from curb stop for each SL b) External pipe CCTV inside curb box for each SL c) Perform in-home water quality sampling (targeted, flushed, or sequential) d) Use statistical analysis and/or modeling: Field verify one point at a statistically representative percentage of the service lines for this area (e.g., neighborhood). Field verification can include a or b above.	Choose one of the following: a) 1-point excavation >18" from curb stop **and** visual observation of the material entering the residence for each SL b) 2-point excavation at each SL c) Visual observation inside home prior to meter at every connection and a model/statistical analysis d) Visual observation inside the home and in-home water sampling (targeted, flushed, or sequential)

Section 3. Examples with or without CCT

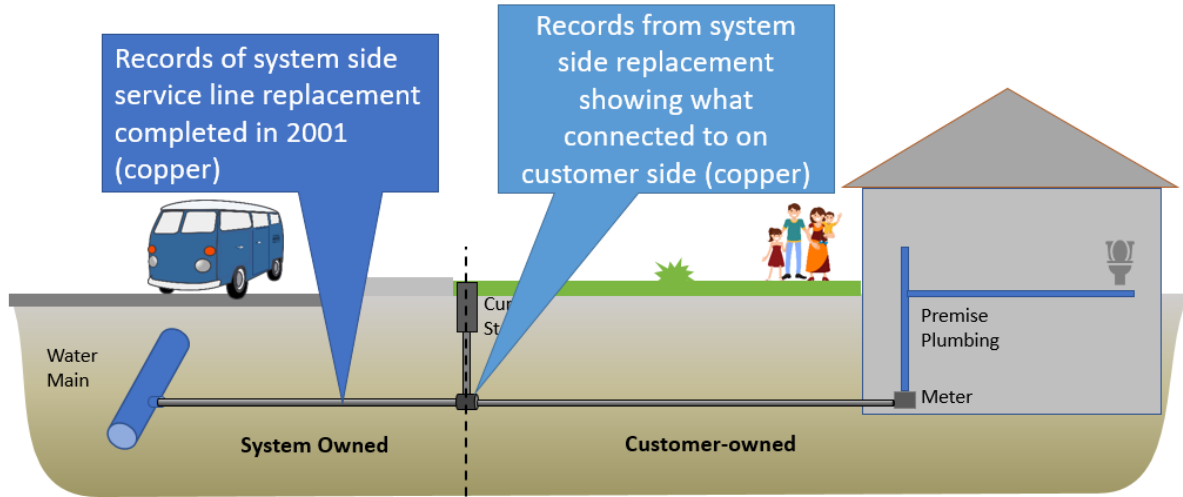## Example 11a: Curb stop replacement records

	System Side	Customer Side
System has:	No records of original installation Record of observation from curb stop replacement in 2016 showing connected to copper	No records of original installation Record of observation from curb stop replacement in 2016 showing connected to copper
Additional Actions Expected:	None (due to post '91, nature of curb stop replacement and the excavation involved)	Previous material observations at the curb stop represents one point and a second point is expected. Choose one of the following: a) Visual observation of the material entering the residence b) 1-point excavation at a location along the customer-side SL

Example 11b: Curb stop replacement records with historical installation records

	System Side	**Customer Side**
System has:	Installation records from 1975 showing copper Record of observation from curb stop replacement in 2016 showing connected to copper	Installation records from 1975 showing copper Record of observation from curb stop replacement in 2016 showing connected to copper
Additional Actions Expected:	None (due to post '91, nature of curb stop replacement and the excavation involved)	None (due to post '91, nature of curb stop replacement and the excavation involved)

Example 12: System-side records showing connection to customer side

	System Side	Customer Side
System has:	Records of system side service line replacement completed in 2001	Records from *system side* service line replacement (2001) showing what the line was connected to on customer side Building records show homes were built in the 1950s.
Additional Actions Expected:	None	Previous material observations at the curb stop represents one point and a second point is expected. Choose one of the following: a) Visual observation of the material entering the residence b) 1-point excavation at a location along the customer-side SL