

Requirements for Lead and Copper Management

Municipal Public
Drinking Water Supplies

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Department of Environment and Climate Change

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1.0 Introduction

1.1 Purpose

The purpose of this document is to define the minimum actions an Approval Holder must take to comply with the Nova Scotia Department of Environment and Climate Change's (ECC) requirements for lead and copper management in single and multi-unit residences.

The document is divided into six sections:

- 1) Planning your program;
- 2) Communicating your program and obtaining participants;
- 3) Collecting samples for lead and copper;
- 4) Notifying and investigating the source of lead;
- 5) Taking action; and
- 6) Record keeping and reporting.

Refer to flowcharts in Appendix A for an overview of the requirements.

1.2 Objectives

The objectives of ECC's requirements are to:

- Provide a consistent approach to assess regulatory compliance with the maximum acceptable concentrations (MAC) for lead and copper in drinking water;
- Assess public exposure;
- Identify interim measures to reduce exposure in response to an exceedance; and
- Identify the presence of lead service lines so that the Approval Holder may develop and implement a plan to remove lead from their system and reduce public exposure.

A supplementary document titled "Guidance on Lead and Copper Management – A Toolkit for Municipal Public Drinking Water Supplies" has been prepared to assist the Approval Holder in complying with the requirements outlined in this document.

1.3 Compliance

The Approval Holder is responsible for addressing lead and copper exceedances if they distribute water that is corrosive to distribution and plumbing system components and/or the public portion of the service line (i.e. the portion of the line from the water main to curb stop) is composed of lead.

The Approval Holder will be considered in compliance with ECC's lead and copper management requirements outlined in this document if they carryout the **minimum** actions to:

- 1) Obtain the required number of program participants (sections 2 and 3);
- 2) Collect samples for lead and copper adhering to the protocols described herein (section 4);
- 3) Notify the owner(s) of their sample results (section 5);
- 4) Notify ECC of exceedances of the lead and/or copper MAC (section 5);
- 5) Carryout investigative sampling or other acceptable method(s) to determine the source of lead, specifically whether it is from the publicly owned portion of the service line (section 5); and
- 6) Fulfill annual sampling plan and annual reporting requirements (section 7).

2.0 Planning your program

Prior to conducting sampling the Approval Holder shall perform a survey of their distribution system to identify areas at a higher risk of lead and copper release due to the presence of lead service lines; lead containing solders; brass fittings; galvanized steel, unplasticized polyvinyl chloride, copper pipes and fittings.

Given the health effects of lead and that there is no safe level, sample locations shall be prioritized based on the presence of lead containing materials in the distribution and plumbing system.

Where records are available on the construction materials used for service lines and fittings, the Approval Holder shall select locations for sampling in the following sequence:

- 1) At least 50% of sample locations have lead service lines, where present (high risk location);
- 2) Sample locations that have copper pipe with lead solders (medium risk location); and
- 3) Sample locations with brass fittings containing lead (low risk location)

Where records are not available on the construction materials used for service lines and fittings, the Approval Holder shall select locations for sampling based on the date of construction in this order:

- 1) Built prior to 1975 (high risk location);
- 2) Built after 1975, but before 1986 (medium risk location); and
- 3) Built after 1986 (low risk location)¹

¹ ECC recognizes that what is considered a low risk sample location for lead may be a high risk location for copper. Given that there is no safe level of lead sample locations shall be prioritized based on the potential presence of lead containing materials.

ECC recommends the Approval Holder create a lead service line inventory using information obtained from construction and/or service records, water meter installation/inspection, hydro excavation, etc. This information will assist the Approval Holder target locations for sampling and will be required if the Approval Holder would like to request ECC remove their requirements for lead and copper sampling (see section 6.1).

3.0 Communicating your program and obtaining participants

In accordance with section 2.0, the Approval Holder shall target participants:

- In high and medium risk sample locations,
- If the minimum number of participants outlined in Table 2 are not obtained, participants in low risk sample locations shall be targeted.

Prior to April 1st of each year, the Approval Holder shall carryout at least **one** of the following methods of communication to obtain participants:

- Phone;
- Communication within a water bill;
- Letter or email to the residence owner(s); or
- Flyer or pamphlet left at the residence.

The Approval Holder shall provide the following information in their communication:

- Brief description of the program and regulatory responsibility;
- Why the customer's residence was selected for participation (e.g. records indicate presence of lead service line, age of the residence, etc.);
- Health effects of lead and copper concentrations above the MAC;
- Actions the owner(s) will be required to take if they agree to participate (e.g. book day and time for sample collection); and
- Actions the Approval Holder will take once they receive the sample results.

If the minimum number of sample locations outlined in Table 2 are not obtained, the Approval Holder will be considered in compliance with the minimum requirements to obtain the re-

quired number of program participants if they demonstrate compliance with sections 2.0 and 3.0 of this document (i.e. identify the number of sample locations targeted, why the locations were selected, provide a copy of public communications including the date sent and method of communication).

Once the owner(s) have agreed to participate in the Approval Holder's lead and copper management program, the Approval Holder shall comply with the minimum requirements for sampling, notification, investigating the source of lead, and annual reporting as outlined in this document.

4.0 Collecting samples for lead and copper

The Approval Holder shall collect the minimum number of samples outlined in Table 2 for lead and copper from residences in accordance with the requirements outlined in this section. Both lead and copper can be analyzed from the same sample.

The Approval Holder shall include their operating approval number and the method of sampling (i.e random daytime testing (RDT), profile sampling (PS)) on the laboratory's sample submission form. The method of sampling shall be abbreviated and included as part of the sample location information (e.g. 126 Sussex Drive-RDT, location A-PS).

The purpose of the sampling protocol outlined in this section is to assess public exposure to lead and copper. Sampling may also serve as a screening tool to identify sources of lead in the distribution system in situations where the Approval Holder does not have access to records. ECC recommends that, in addition to sampling, the Approval Holder consider other methods to identify the service line material of construction. Examples may include visual inspection and scratch tests of the private portion of the service line at the water meter or shut-off valve, capitol projects, hydro excavation, etc.

4.1 Single unit and multi-unit residences (less than or equal to 6 units)²

4.1.1 Sampling Protocol

The Approval Holder shall collect samples for lead and copper utilizing the RDT protocol outlined in Table 1 from the minimum number of sample locations identified in Table 2.

Table 1: Sampling Protocol for Single Unit and Multi-Unit Residences
(less than or equal to 6 units)

Sampling Type	Location	Protocol
RDT	Kitchen cold water faucet	<ul style="list-style-type: none">• Do not remove faucet aerator,• Collect first draw sample in 1L bottle (no prior flushing)

Notes:

1. To facilitate sample collection, the sample may be collected by the owner or occupant.
2. Samples shall be collected from the kitchen cold water faucet as this is the location most often used to obtain water for cooking and drinking purposes. If there is a point-of-use treatment device on the kitchen faucet an alternate location such as the bathroom cold water faucet shall be used.
3. Samples shall be collected in wide mouth bottles without removing the faucet aerator or screen at an uninterrupted flowrate representative of typical household use.
4. Do not collect samples from residences that have a point-of-entry treatment device such as a water softener.

² Where the Approval Holder has system specific knowledge on the diameter of lead service lines used to connect single and multi-unit residences they may use this knowledge to target residences as opposed to the cut-off value of 6 units. For example, if you know your utility did not use lead service lines to connect multi-unit residences with greater than 4 units than the Approval Holder may use 4 units as their cut-off for sample site selection.

4.1.2 Minimum Number of Samples

The Approval Holder shall collect samples for lead and copper from the minimum number of samples locations outlined in Table 2 based on the population served. The samples shall be collected between May 1st and September 30th of each year.

Table 2: Minimum Number of Sample Locations – Single Unit and Multi-Unit Residences
(less than or equal to 6 units)

Number of People Served*	Number of Sample Locations (Annual)
≤500	5
501-3,300	10
3,301-10,000	20
10,001-100,000	30
>100,000	50

*Number of people served refers to the average population served by the municipal public drinking water supply.

To meet the minimum number of samples in any given sampling period, the Approval Holder shall not collect multiple samples from the same single unit or multi-unit residence (less than or equal to 6 units).

4.2 Distribution Systems that Purchase Water from Another Municipal Public Drinking Water Supply

In determining the minimum number of required lead and copper samples, the Approval Holder of a distribution system that purchases water from an Approval Holder of an adjacent municipal public drinking water supply to which they are connected may request that ECC consider their population part of the Approval Holder's population from which they purchase water. Otherwise each Approval Holder shall collect the minimum number of samples from their system as outlined in Tables 2.

ECC will consider the request if a signed written agreement between the two Approval Holders is provided that identifies which Approval Holder is responsible for the following:

- Obtaining program participants (sections 2 and 3);
- Sample collection (section 4);
- Notification of sample results (section 5);
- Investigation to determine the source of lead (section 5);
- Taking action, if applicable (section 6); and
- Annual reporting (section 7)

4.3 Sample Information

The following information shall be recorded for each sample, as available:

- Civic address of sample location;
- Name, telephone number and email address of the owner(s);
- Mailing address of the owner(s);
- Public side service line material and diameter;
- Private side service line material and diameter at shut-off valve or water meter;
- Name of sampler, date and time of sample collection;
- Sample location (i.e. kitchen or bathroom faucet); and
- Sampling method (e.g. 1L RDT, profile sampling).

4.4 Change of Sample Locations

There is no requirement for the Approval Holder to continue to sample from locations where lead concentrations are below the detection limit to meet the minimum number of required samples each year.

If there were detectable levels of lead in a sample, the Approval Holder may choose to keep the residence as a sample location if the owner(s) are willing.

5.0 Notifying and investigating the source of lead

5.1 Initial Notification

5.1.1 Sample Result is Below the MAC for Lead and Copper

If there is no exceedance of the lead or copper MAC, the Approval Holder shall notify the owner(s) of their sample results by mail or email within **30 days** of receiving the results from the lab.

5.1.2 Sample Result Exceeds MAC for Lead or Copper

If there is an exceedance of the lead or copper MAC, the Approval Holder shall notify ECC by telephone immediately upon becoming aware of the sample results from the lab and provide the results to ECC by email. In addition, the Approval Holder shall notify the owner(s) of their sample results within **14 days** of receiving the results from the lab.

The Approval Holder shall recommend measures the owner(s) and/or occupant(s) can take to reduce their exposure.

The following measures shall be included in the letter or email notification from the Approval Holder to the owner(s) to outline measures they can take to reduce their exposure:

- Flush pipes by running the water until it is cold (about a minute) after water has been sitting in pipes for several hours (e.g. first thing in the morning, after work, etc.);
- Use a drinking water treatment device certified to meet the National Sanitation Foundation (NSF) standards 53 or 58 (reverse osmosis units) for the removal of lead and copper. While a faucet mounted unit is preferred, pitcher style filters are also acceptable;
- Inspect and clean faucet aerators or screens monthly. If there is debris, inspect and clean more frequently to remove particles that may contain lead;
- Replace brass faucets and valves with those certified to have a low lead content; and
- If the private side of the service line is composed of lead, replace it.

5.2 Investigate to Determine the Source of Lead

Note: There is no requirement to investigate the source of copper as it is an acceptable plumbing material. There is no requirement to investigate the source of lead if the service line material is already known.

For location(s) that exceed the MAC for lead, the Approval Holder shall submit a plan to ECC on or before **October 31st** of the same year in which the initial sample(s) was collected. The plan shall outline how the Approval Holder plans to determine the source of lead demonstrating compliance with this section and include a schedule for implementation.

If the owner(s) will not allow the Approval Holder to carryout the actions outlined in this section, the Approval Holder will be considered in compliance if they complete the following assessment to rule out the source of lead is from their distribution system infrastructure:

- Carryout the notification described in section 5.1;
- Verify the lead and copper concentrations leaving the treatment facility are below the MAC; and
- Verify the lead and copper concentrations at a nearby location in the distribution system are below the MAC. An acceptable nearby location may be a fire hydrant, or closest approved microbiological or corrosion monitoring location within the same hydraulic zone.

5.2.1 Single Detached Residences

If acceptable to the owner(s), the Approval Holder shall conduct profile sampling as outlined in Table 3 at each single detached residence that exceeded the lead MAC to determine the source (i.e. household plumbing versus lead service line). Profile samples may be collected at any time during the year.

In lieu of profile sampling, the Approval Holder may use hydro excavation to determine the presence of a lead service line. If the Approval Holder selects an alternate method to determine the source of lead, the method shall be reviewed and accepted by ECC prior to implementation.

Table 3: Profile Sampling Protocol

Sampling Type	Location	Protocol
Profile	Kitchen cold water faucet	<ul style="list-style-type: none">• Allow water to stagnate in pipes for a minimum of 6 hrs.• Label a minimum of four* 1-L bottles in the order they will be filled.• If present, do not remove the faucet aerator or screen.• Without flushing and ensuring minimal wastage between bottles, turn on the cold-water faucet and fill each of the 1-L bottles, consecutively.

Notes:

1. During the minimum 6-hr stagnation period, no water can be used in the residence. This includes water for flushing toilets, showering, laundering clothes, etc. It is best to collect the samples first thing in the morning or after work, if water is not used during the day.
2. To facilitate sample collection, the owner or occupant may collect the samples utilizing instructions provided by the Approval Holder.
3. Samples shall be collected from the kitchen cold water faucet as this is the location most often used to obtain water for cooking and drinking purposes. If there is a point-of-use treatment device on the kitchen faucet, an alternate location such as the bathroom cold water faucet shall be used.
4. Samples shall be collected in wide mouth bottles without removing the faucet aerator or screen at an uninterrupted flowrate representative of typical household use.
- 4) Do not collect samples from residences that have a point-of-entry treatment device.

**Depending on the pipe material(s), length(s) and diameter(s), additional sample volumes may be required to cover the pipe volume from the sample location to the watermain. Additional information is provided in the tool-kit document.*

5.2.2 Multi-unit Residences Less than or Equal to 6 Units

Due to the difficulty in coordinating stagnation periods for each unit in multi-unit residences, the Approval Holder may use an alternate method such as hydro excavation to identify the presence of a lead service line. If the Approval Holder selects a method other than hydro excavation, the method shall be reviewed and accepted by ECC prior to implementation.

5.3 Profile Sampling – Interpretation of Sample Results

To inform appropriate corrective actions, the Approval Holder shall interpret the results of profile sampling to determine if the source of lead is the service line and/or premise plumbing.

5.4 Notification of Investigation Results

The Approval Holder shall notify ECC and the owner(s) by mail or email of the results of their investigation within **30 days** of identifying the source of lead. If profile sampling was conducted, the Approval Holder shall include a copy of the laboratory analysis report with their notification to ECC. As ECC is already aware of the initial exceedance, there is no requirement to immediately notify ECC if the profile sample results exceed the MAC.

6.0 Taking Action

The most effective actions to reduce public exposure to lead and copper are the removal of lead service lines and corrosion control ³.

For municipal supplies that have a partial or complete service line inventory identifying the presence of lead service lines, the Approval Holder **may** submit a lead service line removal plan to ECC for review and acceptance. Guidance on the development of the plan is included in the Toolkit document.

Once the plan is reviewed and accepted by ECC, the Approval Holder will be required to report on their progress annually as part of their annual report due on or before April 1st.

6.1 Removal of Lead and Copper Sampling Requirements

The Approval Holder may submit a request to ECC to remove the requirement for the municipal public drinking water supply to collect samples for lead and copper, if they meet the following requirements:

- The municipal supply has a complete service line inventory identifying no lead service lines are present in their system; and
- The water is not corrosive to distribution and plumbing system components.

³ Health Canada is currently revising their *Guidance on Controlling Corrosion in Drinking Water Distribution Systems (2009)*. Once the document is final, ECC will provide additional guidance to the Approval Holder on the minimum requirements necessary to demonstrate the water is not corrosive to distribution and plumbing system components.

7.0 Record Keeping and Annual Reporting

7.1 Annual Sampling Plan

The Approval Holder shall update their annual sampling plan to include the following information from their lead and copper management program:

- Lead and copper sampling method (e.g. RDT);
- Number of residences that will be targeted for sampling;
- Rationale for selecting the residence (e.g. lead service line, date of construction); and
- Methods implemented and/or planned to obtain participants.

The Approval Holder shall submit the annual sampling plan to ECC on or before October 1st of each year.

7.2 Annual Report

The Approval Holder shall report the following information to ECC annually on or before April 1st of each year.

- Population served;
- Number of samples collected for lead and copper;
- Civic address of sample location or unique identifier (e.g. Location A);
- Service line material (public and private side if known);
- Sample date;
- Initial sample protocol (i.e. RDT);
- Sample location (e.g. kitchen faucet);
- Initial lead and copper sample results; and
- Date owner(s) notified of sample results (include an example copy of communication).

If the minimum number of program participants were not obtained, include information on the number of sample locations targeted and why the locations were selected. Provide a copy of the public communications including the date sent and method of communication.

In addition, the Approval Holder shall report the following information for each location that exceeds the lead MAC:

- Investigation method to determine the source of lead (e.g. profile sample, hydro excavation);
- Profile sample results, if applicable;

- Date owner(s) notified of the results of the investigation including profile sample results; if applicable (include an example copy of communication); and
- Lead service line identified at location (yes or no).

Where lead service lines are identified in the municipal public drinking water supply and the Approval Holder has submitted a plan to ECC for review and acceptance to replace the service lines, the Approval Holder shall report the following:

- The total number of lead service lines in your system, broken down by the number of service lines with lead on the private side, public side, and both on the private and public sides;
- The number of unknown service lines, broken down by the number of unknown service lines on the private side, public side, and both on the private and public sides; and
- The number of replacements completed each year against your target number. If you were unable to meet your target, provide rationale and update your program timeline.

8.0 Municipal supplies with established lead and copper management programs

An Approval Holder with an established lead and copper management program ⁴ that meets or exceeds the minimum objectives outlined in this document may submit their program to ECC for review and acceptance as part of their annual sampling plan due on or before October 1st. Upon acceptance, ECC may permit the Approval Holder to continue with the requirements under the established program as an acceptable substitution for meeting a portion of the requirements outlined in this document. The Approval Holder shall not proceed with the continued implementation of their program until it has been accepted by ECC. Regardless of the program implemented the Approval Holder shall comply with the requirements outlined in section 7.

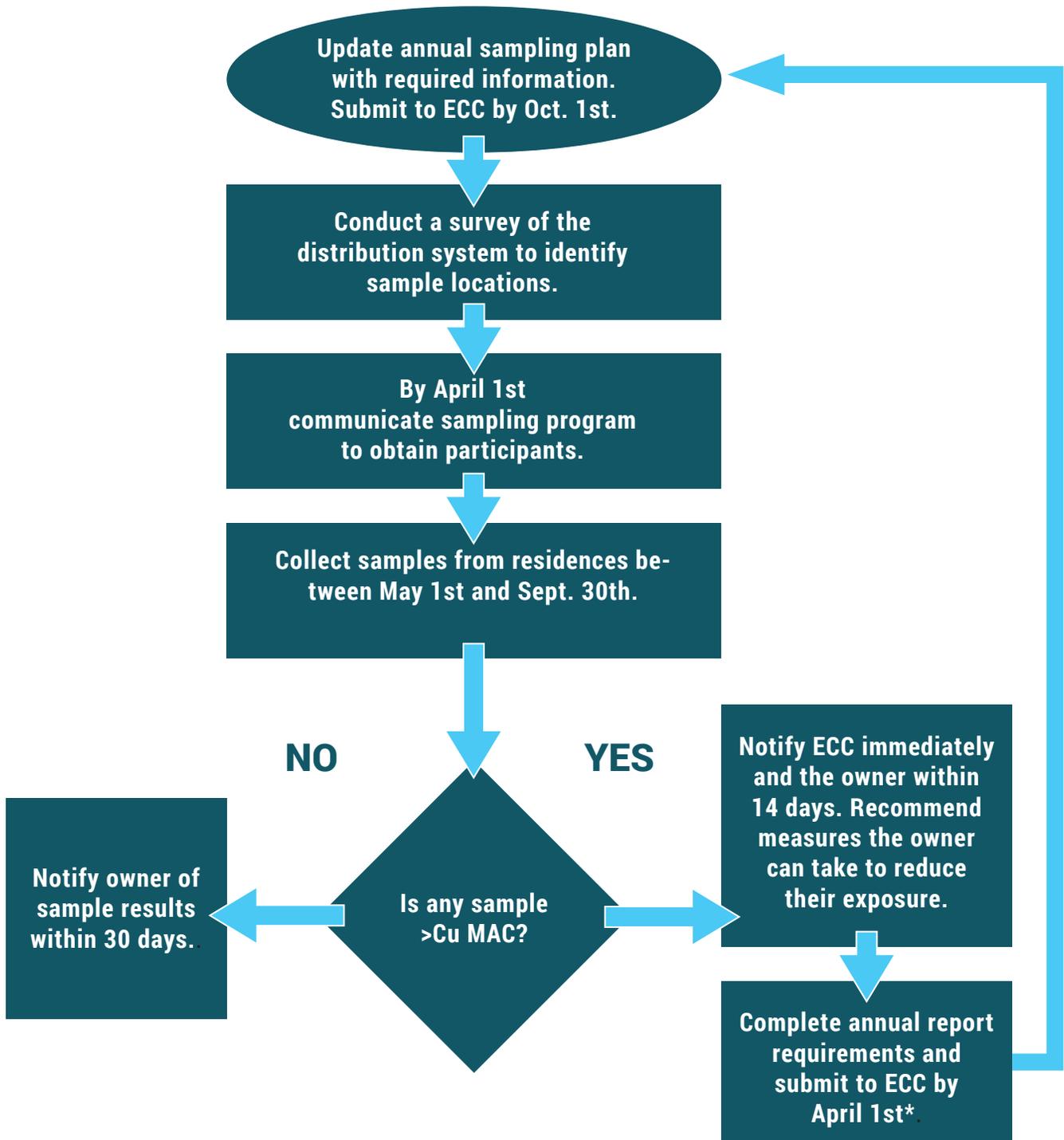
⁴ Acceptable lead and copper management programs include those based on the Tier 1 and 2 sampling protocols outlined in Health Canada's *Guidance on Controlling Corrosion in Drinking Water Distribution Systems (2009)* or the 30 minute stagnation protocol outlined in Health Canada's *Lead Guideline Technical Document (2019)*.

The submission shall include a description of the following:

- Population served by the municipal public drinking water supply;
- How sample locations will be selected (i.e. known presence of lead service line, age);
- How the program will be communicated to obtain participants;
- Number of sample locations that will be targeted each year;
- Sample method;
- How the owner(s) and ECC will be notified of sample results exceeding the lead and/or copper MAC;
- Actions that will be taken in response to a lead and/or copper exceedance; and
- For Approval Holders with a lead service line removal program, a description of the program.

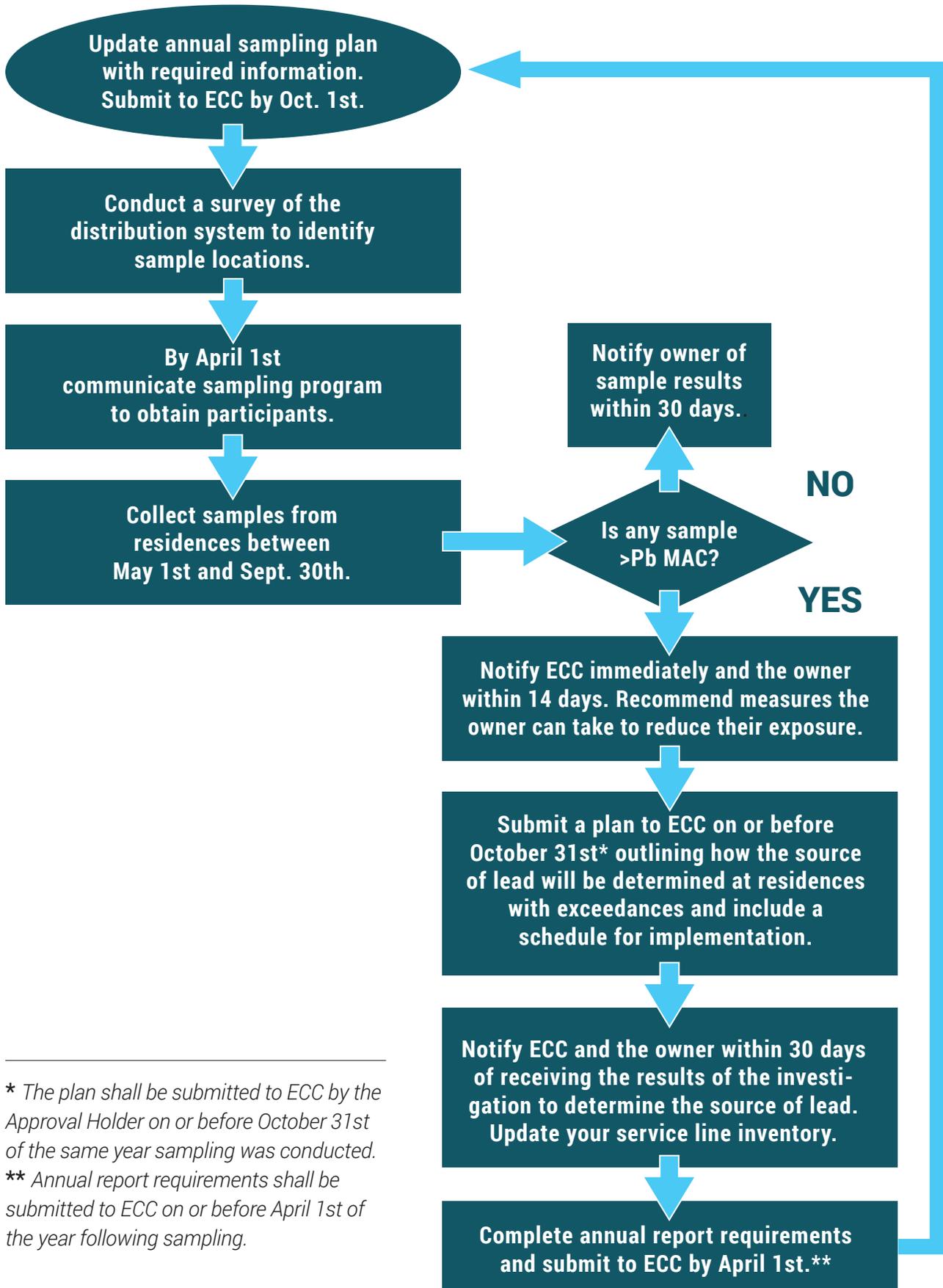
Appendix A Flowcharts

Figure 1. Process Overview – Copper Management Requirements



*Annual report requirements shall be submitted to ECC on or before April 1st of the year following sampling.

Figure 2. Process Overview – Lead Management Requirements



* The plan shall be submitted to ECC by the Approval Holder on or before October 31st of the same year sampling was conducted.
 ** Annual report requirements shall be submitted to ECC on or before April 1st of the year following sampling.

