



Ohio Environmental Protection Agency

Division of Drinking and Ground Waters

Lead and Copper Monitoring Instructions

All Ohio community and non-transient non-community water systems are required to conduct tap monitoring for lead and copper, report sample site information to the appropriate Ohio EPA District Office, and have their laboratory submit results electronically no later than 10 days after the end of each monitoring period. These instructions describe how to select the sites for monitoring, collect the samples, get them analyzed, and complete the appropriate Ohio EPA form for reporting this information. Additional details are available by reading rule 3745-81-86 of the Ohio Administrative Code and by asking your district office representative.

Community and non-transient non-community water systems receive by mail on an annual basis a contaminant monitoring schedule which lists lead and copper monitoring requirements for that year. The schedule is also available for viewing on the Ohio EPA web site. Lead and copper monitoring starts with sampling during two consecutive six-month periods, then progresses to annual, and finally to once every three years. These steps have somewhat different requirements as described below.

TYPES OF LEAD AND COPPER MONITORING

Reduce the risk of a violation by (1) collecting the samples in the first few months of the monitoring period and (2) filing the report as soon as the results are received.
Note: When an action level is exceeded additional sampling is also required.

Initial Six-Month Monitoring

Initial lead and copper monitoring is required during each of two consecutive six-month monitoring periods with each period beginning on either January 1 or July 1. The following number of sampling sites is required:

Population served:	1-100	101-500	501-3,300	3,301-10,000	10,001-100,000	>100,000
Required number of sites:	5	10	20	40	60	100

Proper collection of samples and choice of sampling sites are described in later sections of these instructions.

The Ohio EPA District Office must receive the report of lead and copper monitoring no later than 10 days after the end of the monitoring period. For initial six-month monitoring periods, that date would be either July 10, or January 10.

Reduced Annual and Triennial Monitoring

Annual and triennial monitoring is required during the warm months of June through September. The following number of sampling sites is required:

Population served:	1-100	101-500	501-3,300	3,301-10,000	10,001-100,000	>100,000
Required number of sites:	5	5	10	20	30	50

Proper collection of samples and choice of sampling sites are described in later sections of these instructions.

The Ohio EPA district office must receive the report of lead and copper monitoring no later than 10 days after the end of the monitoring period. For annual and triennial monitoring periods, that date would be October 10 of that year.

SAMPLING SITE SELECTION (BUILDINGS TO USE FOR SAMPLING SITES)

The first-draw lead and copper samples must be collected from tier 1 sites. (Note: For those systems that have lead service lines, 50% of the samples must be collected from sites with lead service lines). If insufficient tier 1 sampling sites are available, then a system may complete its sampling pool with tier 2 sites. For community water systems, if insufficient tier 1 and tier 2 sampling sites are available, then a system may complete its sampling pool with tier 3 sites. If any sampling sites are not tier 1 sites, explain in the space provided on form EPA 5105. The various tiers are defined as follows:

Community Water System sampling sites

Tier 1 - Single family residences (SFRs) that contain copper pipes with lead solder* installed after 1982 (CuPb>82) or contain lead pipes (Pb); single family residences with lead service lines. Multiple family residences (MFRs) with such piping can be included if MFRs are at least 20 percent of the structures served by the water system. Residences with point-of-use or point-of-entry devices, such as water softeners, are usually excluded. The abbreviations in parentheses are also used on Form EPA 5105 Appendix.

Tier 2 - Buildings (BLDGs), including multiple-family residences (MFRs), that contain copper pipes with lead solder installed after 1982 (CuPb>82) or contain lead pipes (Pb); buildings, including multiple-family residences, with lead service lines.

Tier 3 - Single family residences (SFRs) that contain copper pipes with lead solder installed before 1983 (CuPb<83).

*lead solder banned in July 1987

Non-Transient Non-Community Water System sampling sites

Tier 1 - Buildings (BLDGs) that contain copper pipes with lead solder* installed after 1982 (CuPb>82) or contain lead pipes (Pb); buildings with lead service lines.

Tier 2 - Buildings (BLDGs) that contain copper pipes with lead solder installed before 1983 (CuPb<83).

*lead solder banned in July 1987

Special cases

Some water systems do not serve enough residences or buildings with lead or soldered copper pipes to meet the requirements for tier sampling sites. Examples are a mobile home park with mobile homes that have plastic piping or a factory or office building with galvanized piping, plastic piping, or copper piping with no lead solder. Such water systems still have to monitor for lead and copper; they should usually pick sampling sites with brass faucets as they will represent the true nature of the water being used for consumption.

Public water systems with centralized water softening must collect samples during normal operating conditions. .

Home or point of use devices that are not controlled by the public water system can be problematic (e.g., softeners). **Sites with these devices should not be used unless no other alternatives are available.**

Questions or concerns about selecting sampling sites or other requirements for lead and copper monitoring should be directed to your Ohio EPA district office, with address and telephone number listed at the end of these instructions.

SAMPLE COLLECTION

After a satisfactory initial choice, the same taps in the same sites should be used for each subsequent monitoring period.

Samples must be collected after the water has stood motionless in the line for at least six hours. Samples collected from a residence must **only** be collected from the cold-water kitchen tap or the cold-water bathroom sink tap. Nonresidential samples must be collected from interior taps typically used for water consumption. (Schools, day care centers and businesses are encouraged to sample from at least some water fountains.) **Samples collected from other taps, such as outside spigots and mop sinks, are not acceptable for lead and copper monitoring.** Samples can

be collected either by an employee, operator or the customer, **making sure that the proper sampling protocol is followed**. Each one liter sample must be analyzed for both lead and copper from all required sites by a laboratory certified by the State. Each sample must specify the address, tap type and location, date, and time collected.

After two satisfactory six-month monitoring periods, systems with a population of 101 or greater are eligible for reduced monitoring. Review results from the last six-month monitoring period and determine if either lead or copper levels are closest to exceeding their action level. Rank those samples (either lead or copper) in ascending orders and select from that list the sites on lines 2, 4, 6, etc. to use for reduced monitoring. **(Note: Systems with a population of 100 or less do not have a reduction in the number of sample sites.)**

If a site becomes unavailable during subsequent monitoring, note the reason on Form EPA 5105 and use an equivalent site from the original sampling pool.

SUBMITTAL OF LEAD AND COPPER MONITORING REPORT (FORM EPA 5105)

1. General Information

Form EPA 5105 (Rev. 4/11) requires some general information to be entered to associate samples collected with the public water system. Enter the beginning and end dates for sampling to verify that the samples were collected during the appropriate period. Check appropriate box for monitoring schedule. (Monitoring between January and June or July and December, check ["6 month" or "optional"] box; monitoring between June and September, check ["annual" or "triennial"] box)

2. Section: "Lead and Copper Tap Monitoring (First-Draw Samples)"

- Line a. The number of sampling sites required is determined by the number of people served by the water system as listed under the TYPES OF LEAD AND COPPER MONITORING heading above.
- Line b. Report whether or not all your sampling sites were "tier 1". (See section on SAMPLING SITE SELECTION) If all the sites are not tier 1, answer **no** and state the reason. (e.g., "No lead pipes. Only 3 houses have copper pipes with lead solder installed after 1982.")
- Line c. If your system has any lead service lines, then 50% of your samples must be collected from sites with lead service lines. If your public water system has less than 50 % lead service line sites available, then this must be explained in the space provided.
- Line d. The same sampling sites must be sampled each monitoring period. Changed sampling sites must be explained in the space provided.
- Line e. Enter the 90th lead and copper values in milligrams per liter (mg/L). [If your analyst reported micrograms per liter (µg/L or ug/L), convert to milligrams per liter (mg/L) by moving the decimal point three places to the left. For example, 13 µg/L = 0.013 mg/L, 320 µg/L = 0.32 mg/L.] These values are determined as follows.
- i. List lead sample results in ascending order and number each line, starting with number 1 for a sample with the lowest concentration.
 - ii. The contaminant concentration of the 90th percentile sample is the 90th percentile contaminant level. For water systems that collect 10 samples per monitoring period, the lead or copper concentration of the sample number 9 is the 90th percentile level. For water systems that collect 20 samples per monitoring period, the lead or copper concentration of the 18th sample is the 90th percentile level. For water systems that collect 5 samples per monitoring period, add the two highest concentrations together and divide by 2 to determine the 90th percentile.
 - iii. If water systems take more than 5 samples but not an even multiple of 10 samples, the 90th percentile level is calculated by linear interpolation. Call the appropriate Ohio EPA district office (at the number listed below) if you want assistance in calculating such 90th percentile concentration.
 - iv. Repeat for copper sample results.

If the 90th percentile lead or copper concentration exceeds an action level (lead 90th% being 0.0155 mg/L = 15.5 µg/L or more, or copper 90th% being 1.35 mg/L = 1350 µg/L or more), then one or more of public education, water quality parameter and lead and copper entry point monitoring, corrosion control treatment, and lead service line replacement may be required. Ohio EPA district offices can give more details on what is required.

3. Required Certification

The operator of record is required to sign the report and certify that the first-draw samples were collected properly.

4. Form EPA 5105 Appendix

Enter the public water system name and the public water system identification number where indicated. Additionally, enter the Analytical Laboratory Name and Certification Number (for inorganic analyses), which can be obtained from the analytical laboratory's report forms.

This form records information which provides verification of the validity of the samples and documents sites sampled which would allow another person to use the same sites in a later monitoring. Record the following information in the appropriate column, using one sample site per line. List samples sequentially by laboratory sample number.

- a. **Date of Sample** – date the sample was collected.
- b. **Time Sample Taken** – time the sample was collected at the tap.
- c. **Laboratory Sample Number** - the sample number assigned by the analytical laboratory; this sample number is printed on the report form sent back to you by the laboratory.
- d. **Address of Sample Site** - street or road address where the sample was taken.
- e. **Tap Type and Location** – type of tap (e.g., bathroom cold water tap, drinking fountain, kitchen cold water tap) and location (e.g., 2nd floor men's room). Be specific enough that someone else could still find the same sample site for later sampling.
- f. **Structure Type** - are usually SFR (single-family residence), MFR (multifamily residence), or BLDG (nonresidential building such as a school, office building, or factory).
- g. **Interior Plumbing Material** - refers to the water line material. Common answers are Pb for lead pipe, CuPb>82 for copper pipe with lead solder installed after 1982, and CuPb<83 for copper pipe with lead solder installed before 1983; such materials as CuLF for copper pipe with lead-free connections, CPVC plastic, and galvanized may have to be used when there aren't enough tier 1, tier 2, and tier 3 sites.
- h. **Service Line Material** - pipe material connecting the building to a water main. Pb indicates lead pipe; Cu indicates copper pipe; galvanized and plastic pipes are also commonly used. (For systems without service lines, include material of pipe connecting the well to the building.)
- i. **Tier** - identifies the tier (defined in "**SAMPLING SITE SELECTION**" above) of this sample location. If none of the tier definitions fit (but this is still a valid sampling site because regular tier sites are not available), write in "other".
- j. **Lead Conc** – lead concentration reported in micrograms per liter (ug/L). If the result is below the laboratory detection limit, enter the detection limit and precede that by a "less than" sign (<). (e.g., < 5.0 ug/L)
- k. **Copper Conc** - copper concentration reported in micrograms per liter (ug/L). If the result is below the laboratory detection limit, enter the detection limit and precede that by a "less than" sign (<).

Form EPA 5105 must be received by Ohio EPA District Office, at an address listed below, no later than ten days after the last day for sampling in the monitoring period.

Ohio EPA recommends submitting the **Lead Consumer Notice Verification Form with a sample Lead Consumer Notice** attached when submitting Form EPA 5105. This will avoid an additional deadline that must be met. For additional information on Lead Consumer Notice requirements contact your Ohio EPA district office or visit the Ohio EPA web site.

If you have questions concerning lead and copper monitoring or reporting, please contact the appropriate Ohio EPA district office listed below.

OHIO EPA DDAGW
CENTRAL DISTRICT OFFICE
P.O. BOX 1049
COLUMBUS, OH 43216
(614) 728-3778

OHIO EPA DDAGW
NORTHEAST DISTRICT OFFICE
2110 E. AURORA RD.
TWINSBURG, OH 44087
(330) 963-1200

OHIO EPA DDAGW
NORTHWEST DISTRICT OFFICE
347 N. DUNBRIDGE RD.
BOWLING GREEN, OH 43402
(419) 352-8461

OHIO EPA DDAGW
SOUTHEAST DISTRICT OFFICE
2195 E. FRONT ST.
LOGAN, OH 43138
(740) 385-8501

OHIO EPA DDAGW
SOUTHWEST DISTRICT OFFICE
401 E. FIFTH ST.
DAYTON, OH 45402-2911
(937) 285-6357