MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
DRINKING WATER AND ENVIRONMENTAL HEALTH DIVISION
SCHOOL DRINKING WATER TRAINING PROGRAM

SCHOOL BUILDING PLUMBING PROFILE

***Note**: Complete for each school. For additional information and accompanying documents, go to the Department of Environment, Great Lakes and Energy (EGLE) guidance documents located at Michigan.gov/SchoolWater.* This document is designed to assist with the determination of lead risk in your facility drinking water and will enable you to prioritize your sampling and remediation efforts. A separate plumbing profile may be needed for each addition, or wing of the building, especially if the construction took place at different times. Some of the questions in this document may not apply to your facility for various reasons. Skip those that do not apply or mark as not applicable (NA). This document should be reviewed/updated annually. A list of commonly used acronyms can be found under Appendix A. Explanations regarding items/questions below are found under *Appendix B: School Building Plumbing Profile Information*.

An asterisk (*) indicates a required field.

PART A: BASIC BUILDING INFORMATION							
*Name of school:							
*School district:							*Building code:
*Type of school:	☐ Preschool	☐ Elementary	☐ Middle	☐ Jr/High	☐ High	☐ Alternative	☐ Other: _____
*Physical street address of building:							*County:
*City:							*Zip Code:
*School contact person (please print):							*Phone number:
*Title of school contact:							
*Name of person completing this form (please print):							*Date form completed:
Grade level(s):							Total student population possible:
Year original building was constructed:							Year(s) of additions:
Building blueprints available?	☐ Yes	☐ No					
Name of drinking water supplier:							
Additional water line connections:	☐ None	☐ Concession stand	☐ Athletic field(s)	☐ Other (specify): _____			

The information in this part may not be known until the building walk-through is completed. Start the building walk-through where the water line comes into the building from the water supplier. Use the building plumbing map and floor plan to follow the flow of cold water throughout the building. To help fill in the boxes below, see *Appendix B: School Building Plumbing Profile Information*.

PART B: GENERAL WATER AND PLUMBING INFORMATION								
1. Where does the water enter the building? This is the POE from the street (or service line). Be specific and note if there are more than one.								
2. Service line material:	☐ Lead	☐ Copper	☐ Galvanized	☐ Ductile/Cast iron	☐ Plastic	☐ Unknown		
	☐ Other (specify): _____							
3. Is there water treatment at the POE?	☐ None	☐ Water softener	☐ Chlorine	☐ Phosphate	☐ Filters	☐ Reverse osmosis		
	☐ Other (list): _____							
4. Are there tanks in the plumbing system? (e.g., pressure or gravity storage tanks)	☐ No	☐ Yes	If YES, then where? _____					
5. What are the cold-water pipes made of in the building?	☐ Lead	☐ Copper	☐ Galvanized	☐ Ductile/Cast iron	☐ Plastic	☐ Unknown		
	☐ Other (specify): _____							
6. If copper pipe, was lead solder used in the plumbing system?	☐ No	☐ Yes	☐ Unknown					
7. When were the most recent plumbing repairs made (year)?	☐ Cold water pipe _____		☐ Classroom bubbler(s) _____					
	☐ Classroom faucet(s) _____		☐ Kitchen food prep fixtures _____					
	☐ Drinking fountain(s) _____		☐ Other (list) _____					
8. What drinking water fixture receives water first?								
9. What drinking water fixture receives water last?								
10. Any brass fittings, faucets or valves in the drinking water system?	☐ No	☐ Yes	☐ Unknown					
11. Any DWFP fixtures being used that were installed prior to 2014?	☐ No	☐ Yes	☐ Unknown					
12. Any water coolers being used that were installed prior to 1988?	☐ No	☐ Yes	☐ Unknown					
13. Total number of DWFP fixtures in the building. Note: Include all drink machines hooked directly to water.				14. Total number of *ALL* outlets inside the building including DWFP, restroom faucets, showers, janitor fixtures, etc.				

PART C: BUILDING WATER SAMPLING INFORMATION AND MAINTENANCE PROGRAMS

15. Review records and consult with the public water supplier to determine whether any drinking water samples have been taken and analyzed in the building for any contaminants other than lead and copper. If so, identify.

Water Contaminants Analyzed	Result of Test	Date Collected

16. Have any water samples been collected and analyzed for lead at this building? ☐ No ☐ Yes ☐ Unknown
If YES, how many? _____ Most recent collection date? _____

17. Were any previously collected lead sample results greater than 5 ppb (0.005 mg/L)? ☐ No ☐ Yes ☐ Unknown ☐ NA
If YES, how many? _____ Location(s): _____

18. Is drinking water testing for lead done regularly at this building? ☐ No ☐ Yes If YES, how often? _____

19. Are there any water fixture POU treatment filters or devices in the building?
☐ None ☐ Faucet filter ☐ Drinking fountain filter ☐ Reverse osmosis device ☐ Kitchen tap filtration system
☐ Other (list): _____

20. How many POU filters or devices *other than* bottle fill stations are in the building? List the brand name(s).
Total #: _____ Brand names: _____

21. How many drinking water bottle fill stations *with filters for the reduction of lead* are in the building? List the brand name(s).
Total #: _____ Brand names: _____

22. Is there a filter maintenance and operation program in this building? ☐ No ☐ Yes If YES, how often? _____

23. Who is responsible for the filter maintenance program? (Name of person or position, i.e., "Facility Director")

Explain the filter maintenance process. You may attach the SOP if needed.

PART C CONTINUED: BUILDING WATER SAMPLING INFORMATION AND MAINTENANCE PROGRAMS	
24. Is there a *routine* "water moving" and/or cold-water flushing program in this building?	☐ No ☐ Yes If YES, how often? _____
Explain the water moving/flushing procedure(s). More than one may be applicable. You may attach the SOP if needed.	
25. Are there screens or aerators on DWFP fixtures in this building?	☐ No ☐ Yes
26. Is there a *routine* screen or aerator maintenance program in this building?	☐ No ☐ Yes If YES, how often? _____
Explain the screen/aerator maintenance process. You may attach the SOP if needed.	
27. Are any food preparation outlets (e.g. kettle fill) or drinking water outlets connected ONLY to the HOT water pipes?	☐ No ☐ Yes ☐ Unknown
28. Are there known plumbing problems?	☐ Signs of corrosion (stained fixtures, deteriorating pipes/fixtures, etc.) ☐ Leaks ☐ Low use areas ☐ Low flow from outlet ☐ Valves that will not turn ☐ Electrical wires connected to pipe ☐ Dead ends ☐ Cross connections ☐ Bad Taste ☐ Other (specify): _____
29. Are renovations planned for the plumbing system?	☐ No ☐ Yes ☐ Unknown If YES, specify date(s): _____
30. Additional Notes:	

This document has been updated on (date)_____ by (print name) _____
(Recommend updating this form if there are any changes to the drinking water fixtures or if plumbing profiles change.)

This School Building Plumbing Profile document was developed in part with excerpts and information from the USEPA's *3T's for Reducing Lead in Drinking Water in Schools and Child Care Facilities (September 2018)* and *Drinking Water Best Management Practices for Schools and Childcare Facilities Served by Municipal Water Systems (April 2013).*

APPENDIX A: COMMONLY USED ACRONYMS	
CPSC	Consumer Product Safety Commission
DWFP	Drinking water and food preparation
EGLE	Michigan Department of Environment, Great Lakes, and Energy
LCCA	Lead Contamination Control Act
MDE	Michigan Department of Education
mg/L	Milligrams per liter
NA	Not applicable
POE	Point of entry (were the water enters the building)
POU	Point of use (pertaining to filters on drinking water fixtures)
ppb	Parts per billion (also written as ug/L)
ppm	Parts per million (also written as mg/L)
SDWA	Federal Safe Drinking Water Act
SOP	Standard operating procedure
ug/L	Micrograms per liter
USEPA	United States Environmental Protection Agency

APPENDIX B: SCHOOL BUILDING PLUMBING PROFILE INFORMATION

This document gives the reasoning behind the information gathered for the *School Building Plumbing Profile* (Profile) and may assist you in conducting a building walk-through to follow the flow of cold water through the building and completing the Profile. Part A: Basic Building Information corresponds with page 1 of the Profile. Parts B and C correspond with pages 2-4 of the Profile and are numbered accordingly.

PART A: BASIC BUILDING INFORMATION	
PLUMBING PROFILE INFORMATION AND QUESTIONS	**WHAT PLUMBING PROFILE INFORMATION/QUESTIONS MEAN**
MDE school building code	This is the unique school building code issued by the MDE. This is not the district code.
School contact person **Title of school contact**	The name of the person to be contacted if there are questions regarding the plumbing profile document. Include their title, i.e., “facility director” or “superintendent”.
Name of person completing this form	This may be the same person listed as the contact.
Date form completed	The date the form was completed helps others know how recent the information in the document is and whether it needs to be updated.
Grade level(s)	This helps in prioritizing sampling for lead in drinking water and potential grants. Lead has greater effect on younger children.
Total student population possible	This helps determine the size of the building, extensiveness of the plumbing system, and potential for water stagnation if the building is not occupied by the “built out” number of students.
Year original building was constructed	**Older Buildings** – Through the early 1900s, lead pipes were commonly used for interior plumbing in certain parts of the country. Plumbing installed before 1930 is more likely to contain lead than newer pipes. After 1930, copper generally replaced lead as the most commonly used material for water pipes. Up until the mid-to-late-1980s (when the “lead-free” requirements of the 1986 SDWA Amendments took effect), lead solder was typically used to join these copper pipes. The efforts of a public water system over the years to minimize the corrosiveness of the water may have resulted in a protective coating of mineral deposits forming on the inside of the water pipes (passivation). This coating shields the water from the plumbing and generally results in decreased lead levels in water. If the coating does not exist or is disturbed, the water is in direct contact with lead in the plumbing system.

PART A: BASIC BUILDING INFORMATION, CONTINUED	
Year(s) of additions (added to the original facility)	**Newer Buildings** – New buildings are not likely to have lead pipes in their plumbing systems, but they are very likely to have copper pipes with solder joints. Buildings constructed prior to the late 1980s, before the "lead-free" requirements of 1986, may have joints made of lead solder. Buildings constructed after this period should have joints made of "lead-free" solders. In addition, "lead-free" brass fixtures or plumbing components purchased or installed prior to 2014 (the effective date of the Reduction of Lead in Drinking Water Act) were allowed to contain higher levels of lead. Even if "lead-free" materials were used in new construction and/or plumbing repairs, lead leaching may occur as "lead-free" fixtures may still contain up to 0.25 percent lead on the wetted surface of each fixture component.
Are building blueprints available?	Having blueprints of the building's plumbing system will help to follow the flow of cold water through the building in order to develop a proper sampling plan and routine flushing program.
Name of drinking water supplier	This is who delivers water to the building, such as a city, town, or village water department. Please enter the name of the water supplier e.g., "City of Grand Rapids" or "James Township" or "Village of Spring Lake."
Additional water line connections	Do you have any "outbuildings" such as a concession stand, athletic field, etc. that has water for drinking or food preparation purposes? These buildings/areas should also be tested for water quality (bacteria, lead, copper). The water to these areas is often shut down for a season, making the plumbing vulnerable to contaminants. There are specified procedures for the start-up of a plumbing system after it has been de-pressurized.

PART B: GENERAL WATER AND PLUMBING INFORMATION	
PLUMBING PROFILE INFORMATION AND QUESTIONS	**WHAT THE PLUMBING PROFILE INFORMATION/QUESTIONS MEAN**
1. Where does the water enter the building? This is the POE from the street. It may also be referred to as the service line. **How many service connections are in the building?**	It is important to locate the point at which water is delivered to the building from the water supplier (service line). This is where you will start the building walk-through as you follow the flow of cold water in the building. The walk-through helps locate lead components and drinking water fixtures, and aids in the development of lead sampling and water flushing plans. The collection of lead samples must be done in a specific order to get meaningful results. Some larger buildings may have more than one POE so make sure you note where each is located. One building in a district may be connected to the water supply from one of the other buildings and not directly from the street, this would be the POE and not considered a service line.
2. Service line material: Of what materials is the service connection (the pipe that carries water to the school or childcare facility from the public water system's main in the street) made?	Lead piping was often used for the service connections that join buildings to public water systems before 1986. In larger schools, the service line is probably not lead because lead is impractical for the larger service lines typically used in these facilities; however, many childcare facilities reside in small buildings and have a higher likelihood of being served by lead lines. Although a protective layering of minerals may have formed on these pipes, vibrations can cause flaking of any protective build-up and, thus, allow lead contamination to occur.
3. Is there water treatment at the POE?	POE treatment units could be, but are not limited to, filters, ion exchange units (water softeners), phosphate and chlorine treatment, or other type of treatment process that adds chemicals to the water system where the water comes into the building. Treatment of the water may change the composition of the water creating corrosive (aggressive) water that may strip any protective build-up on the pipe and allowing lead contamination to occur. Drinking water treatment may need to be permitted by the local health department or EGLE.
4. Are there tanks in the plumbing system? **(e.g., pressure or gravity storage tanks)** Note the locations of any tanks and any available information about the tank (e.g., manufacturer or date of installation).	Some older tanks may contain coatings that are high in lead content. Tanks may accumulate sediment that could be flushed back into the plumbing system under certain circumstances. You may wish to contact the supplier or manufacturer to obtain information about coatings or hire a plumber or tank service contractor to inspect the tanks, especially gravity storage tanks that are located outside of the building.

PART B: GENERAL WATER AND PLUMBING INFORMATION, CONTINUED	
5. What are the cold-water pipes made of in the facility? Examples include: Lead, plastic, galvanized metal, cast iron, copper, other. ***Only cold-water should be used for drinking and food preparation.*** Hot water is not recommended for consumption (drinking/cooking).	Survey the building for exposed pipes, preferably accompanied by an experienced plumber who should be able to readily identify the composition of pipes on site. Most buildings have a combination of different plumbing materials. Lead pipes are dull gray in color and may be easily scratched by an object such as a knife or key. Also, a magnet will not stick to lead. Galvanized metal pipes are gray or silver-gray in color and are usually fitted together with threaded joints. A magnet will stick to galvanized iron pipe. In some instances, compounds containing lead have been used to seal the threads joining the pipes. Debris from this material which has fallen inside the pipes may be a source of contamination. Copper pipes are red brown in color. Corroded portions may show green deposits. Copper pipe joints were typically joined together with lead solders until the "lead-free" requirements of the 1986 SDWA Amendments took effect. Plastic pipes, especially those manufactured abroad, may contain lead. If plastic pipes are used, be sure they meet NSF International standards, Info.NSF.org/Certified/PWSComponents/.
6. If copper pipe, was lead solder used in the plumbing system?	The 1986 SDWA Amendments banned plumbing components that contained high levels of lead. It is likely that high-lead solder and fluxes continued to be used until 1988 and even later in some areas of the country. The local plumbing code authority or building inspector may be able to provide guidance regarding when high-lead solder was last used on a regular basis in the area. It is important to note that the Reduction of Lead in Drinking Water Act did not revise the "lead-free" definition for solder and flux.
7. When were the most recent plumbing repairs made?	If the building (or an addition, new plumbing, or repair) is less than five years old and lead solder or other leaded materials were used (e.g., brass fixtures containing lead alloys, especially those purchased or installed prior to 2014 when the Reduction of Lead in Drinking Water Act took effect), elevated lead levels may occur. If water supplied to the building is corrosive, lead can remain a problem regardless of the plumbing's age.
8. What drinking water fixture receives water first?	Once the service line is located, follow the flow of cold water to find the first water fixture used for drinking or food preparation. This will be the first to sample for lead when multiple samples are collected on the same day. Assign this fixture with a unique individual identification code (ID) and record its location on the Profile and on the floor plan. Record the ID number on the *Drinking Water Fixture Inventory* and/or *Individual Fixture Information* forms which are available online at Michigan.gov/SchoolWater. Continue to follow the cold-water pipe until all DWFP fixtures are identified, coded, and recorded. Assistance from a plumber may be required if the building has multiple wings or floors in order make a best judgement on how the cold water flows through the building and the order it gets to each tap.

PART B: GENERAL WATER AND PLUMBING INFORMATION, CONTINUED	
9. What drinking water fixture receives water last?	A lead sampling plan will be developed based on the flow of cold water and location of fixtures in order to get a first draw of water out of each fixture during the sampling event. Identification of all water fixtures will also aid in the proper flushing of the plumbing system. Locate the fixture farthest from the service line (in each wing or floor of the building if applicable) and record it. This will be the last tap to sample and may be the first fixture to open during certain flushing procedures.
10. Any brass fittings, faucets or valves in the drinking water system? (Note: Most faucets are brass on the inside)	Brass fittings, faucets, and valves are golden yellow in color, similar to copper in appearance, or are plated with chrome. After 1996, brass fittings installed in drinking water fixtures such as faucets and water coolers were required to meet NSF/ANSI standards for lead content (NSF/ANSI 61, NSF/ANSI 372). While this percentage was considered "lead-free" under the 1986 SDWA Amendments, some contamination problems still may occur. Older brass faucets and components may contain higher percentages of lead and lead solder in their interior construction and pose contamination problems. The degree to which lead will leach from brass products containing alloys with less than 8 percent lead is dependent upon the corrosiveness of the water and the manufacturing process used to develop the product. You should request NSF/ANSI 61 certification on all drinking water system products purchased. Include a copy of the NSF/ANSI 61 certificate as a requirement on the purchase orders. The distributor or manufacturer can provide a list of certified products. NSF 372 covering pipes, pipe fittings, plumbing fittings, and fixtures was adopted in 2010, and it dictates that a product has been certified as meeting a weighted average lead content of less than or equal to 0.25 percent when used with respect to wetted surfaces. See the USEPA's 2013 guidance, *How to Identify Lead-Free Certification Marks for Drinking Water System and Plumbing Materials*, for additional guidance.
11. Any DWFP fixtures being used that were installed prior to 2014?	The age of fixtures will determine how much lead material is present. Older fixtures tend to have more lead content that could potentially be released into the water. The Reduction of Lead in Drinking Water Act reduced lead in pipes, pipe fittings, plumbing fittings, and fixtures to a weighted average of 0.25 percent lead when used with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures. These provisions went into effect in January 2014. If "lead-free" materials were not used in new construction and/or plumbing repairs, elevated lead levels can be produced. If the film resulting from passivation does not exist or has not yet adequately formed, any lead that is present is in direct contact with the water. If replacing a fixture with a certified "lead-free" fixture, running the water through the fixture at a trickle for multiple days will help form that protective film on the wetted surface of the fixture to "cover" any existing lead. Collect a sample to be analyzed for lead after proper "flushing" and before the tap is returned to service to make sure there is no lead risk to those consuming the water.

PART B: GENERAL WATER AND PLUMBING INFORMATION, CONTINUED	
12. Any water coolers being used that were installed prior to 1988?	Older water coolers (purchased or installed prior to 1988) may be a major source of lead contamination. See the USEPA's list of banned water coolers found to contain lead in Appendix C. If a water cooler is listed as having a lead-lined tank, its water should not be used for drinking and the cooler should be removed immediately as these coolers pose the highest risk of contamination.
13. The total number of DWFP fixtures in the building Count the number of the following fixtures that provide water for consumption (drinking or food preparation/cooking): Water coolers (plug-in with chiller unit and reservoir), water fountains with central chillers, water fountain with bottle fill stations, bubblers (classroom and drinking fountain without a chiller unit), cold-water taps (classroom faucets, nurses' faucet), ice makers, kitchen taps, kitchen kettle fillers, drink machines connected to the water supply, etc.	In addition to lead components in the plumbing system, lead solders or lead in the brass fittings and valves used in some faucets, fountains, and refrigerated water coolers may be sources of lead. It is important to identify the locations of all such drinking water fixtures. Faucets in bathrooms should not be used to obtain water for drinking. Although they may be adequate for washing hands, they may not be appropriate for drinking purposes. However, if bathroom faucets, locker room showerheads, and non-traditional drinking water fixtures are known to be used for drinking or cooking (e.g., fill water jugs), sampling should be conducted. Note the locations of the fixtures on a floor plan and record information about each on an *Individual Fixture Information* sheet or *Water Fixture Inventory* spreadsheet. Both forms may be found online at Michigan.gov/SchoolWater. You may consider posting "Do Not Drink or Cook" signs on all water outlets that are not designated for drinking or cooking and direct all students and staff to drink at proper drinking water fixtures. Hydration stations, a water fountain with a bottle fill station that may also have an internal filter that is certified for the reduction of lead, are often used as the designated drinking water locations.
14. The total number of *ALL* outlets inside the building including DWFP, restroom faucets, showers, janitor fixtures, etc.	This number is needed for routine water flushing programs that are recommended for every school building. There are different flushing programs for different purposes. Some flushing programs involve opening all water outlets to remove stagnant water from the plumbing system on a frequent basis. A building-wide program that involves high-velocity zone flushing helps with the removal of stagnant water and solid materials (particulates which may include lead particles) and is recommended at least twice per year (see Michigan.gov/SchoolWater for EGLE's *Pre-Flushing Event Guidance for School Plumbing* and *Guidance for Flushing School Plumbing* documents). In some events, the running of water for 30 seconds to 15 minutes every time before consumption/cooking may be appropriate at specific outlets; however, it may not be a reliable action to reduce lead risk at that outlet.

PART C: BUILDING WATER SAMPLING INFORMATION AND MAINTENANCE PROGRAMS	
PLUMBING PROFILE INFORMATION AND QUESTIONS	**WHAT THE PLUMBING PROFILE INFORMATION/QUESTIONS MEAN**
15. Review records and consult with the public water supplier to determine whether any drinking water samples have been taken and analyzed in the building for any contaminants other than lead and copper. If so, identify.	Results of analyses of general water quality, such as measures of pH, calcium hardness, and carbonate alkalinity, can provide important clues about the corrosiveness of the water. If there is no data from the school or childcare facility, the public water system should at least be able to provide information about the general water quality or the annual Consumer Confidence Report they are required to provide to all customers.
16. Have any water samples been collected and analyzed for lead at this building? **If collected, how many?** Record the total number of lead samples collected, and the most recent collection date.	The only way to know if lead is in the drinking water system is to test for it. Historical data of lead samples play a key role in determining if the school/childcare facility has a lead risk and if the risk is widespread throughout the building, or isolated to an individual drinking water tap. Collecting only one sample in a building does not give a true sense of the risk that may be present. Recommendation is for a school to collect samples at all fixtures used for drinking or cooking purposes in a building and to develop a routine lead sampling event at least every three years. Lead in drinking water can be variable. Plumbing repairs and general building construction may break loose lead particulates (solid pieces) from the water system that can become trapped in aerators, screens, or filters – causing a fixture that was previously tested and found with no or little lead results to have elevated lead results. Brass in-valves may have some lead component to it and “lead-free” fixtures can have up to 0.25 percent lead on the wetted surface of each fixture component. If the passivation is removed due to excessively corrosive water, lead will release into the water in a soluble form.
17. Were any previously collected lead sample results greater than 5 ppb (0.005 mg/L)? If so, how many? Note the locations. 5 ppb is the same as 0.005 mg/L. Some labs will report 5 ppb as 5 ug/L.	In Michigan, EGLE recommends schools and childcare facilities immediately shut off or remove from service any individual fixture with results that exceed 5 ppb until a permanent solution to reduce the amount of lead in that fixture is completed. This is also the United States Food and Drug Administration’s limit for lead in bottled water. However, since there is no safe amount of lead in drinking water, the goal should be to reduce the amount to zero as time and resources allow on all fixtures. The number of fixtures that are greater than 5 ppb helps determine if there is a building wide problem or an individual tap problem and what corrective actions should be taken.

PART C: BUILDING WATER SAMPLING INFORMATION AND MAINTENANCE PROGRAMS, CONTINUED	
18. Is drinking water testing for lead done regularly at this building?	A one-time, one-fixture water test for lead does not give you enough information to know if your building or other DWFP fixtures have a drinking water lead risk. Also, even though a one-time test shows no or low amounts of lead, particles (particulate lead) from the system and plumbing components may be released due to physical disturbances (e.g., construction), pipe replacement, and connection of new fixtures (knocking particles loose from shutting and opening valves). Soluble lead may be released if the water becomes more corrosive. Regular testing schedules will depend on severity of lead issue.
19. Are there any water fixture POU treatment filters or devices in the building?	POU treatment devices may include under the sink (or "behind the wall") cartridge filters, reverse osmosis devices, or faucet filters meant to remove certain things from the water such as minerals, lead, bacteria, etc. If not properly maintained, these devices may release greater amounts of a contaminant when used and may be subject to vandalization or misuse by users if the filter is bypassed. POU filters on the fixture or under the sink are not recommended for long-term lead reduction measures.
20. How many POU devices other than bottle fill stations are in the building? List the brand name(s). Identify the location of each on a floor plan.	A maintenance program to ensure these devices are used/working properly and to replace filters on a routine schedule is necessary (see Michigan.gov/SchoolWater).
21. How many drinking water bottle fill stations with filters for the reduction of lead are in the building? List the brand name(s). Identify the location of each on a floor plan.	If a drinking fountain with bottle fill station has a filter option, it is important that the filter is certified for the reduction of lead if it is being used for lead risk reduction. Look for the *NSF/ANSI 53 for the reduction of lead* certification. Health effects are set in this standard as regulated by the USEPA and Health Canada. Standard 53 covers adsorption/filtration which is a process that occurs when liquid, gas, or dissolved/suspended matter adheres to the surface of, or in the pores of, an adsorbent media. Carbon filters are an example of this type of product. There are different standard 53 filters for different health effect contaminants, so make sure to get the right filter. The total number in the building and their location will be used for a routine maintenance program to ensure the filters are changed out per the manufacturer's recommendation and as needed.

PART C: BUILDING WATER SAMPLING INFORMATION AND MAINTENANCE PROGRAMS, CONTINUED	
22. Is there a filter maintenance and operation program in this building? If so, how often do you replace the filters or check them to ensure they have not been tampered with?	Routine filter maintenance is essential to ensure it is removing the contaminants it is intended to remove. Replace the filters per the manufacturer's recommendation or when damaged, if the filter has an indicator light telling that it needs replacement, or if the flow of water becomes reduced (another indication that the filter is "full" or clogged).
23. Who is responsible for the filter maintenance program? Explain the filter maintenance process. Attach an SOP if needed to the plumbing profile document.	Multiple custodial staff may check filters on their daily cleaning routine but assigning one person to be in charge of the maintenance program is needed to make sure it is being followed, documented on a filter maintenance form, and filters ordered to be available when needed.
24. Is there a routine "water moving" and/or cold-water flushing program in this building? Explain the water moving/flushing procedure(s). More than one flushing procedure may be applicable depending on what outcome you are trying to achieve.	"Moving" or "flushing" the cold-water pipes and outlets should be done on a routine schedule in order to prevent water stagnation which in turn increases the chance of lead release into the drinking water. Water is the "universal solvent" and is corrosive - it will dissolve anything it is in contact with, including metal plumbing if given enough time. Water that "sits" in the plumbing over weekends and extended breaks such as summer, spring, and winter breaks increases the risk of lead in drinking water. The methods may differ depending on the building and desired outcome. Some flushing programs involve opening all water outlets to remove stagnant water from the plumbing system on a frequent basis. A building wide "zone" plumbing system flush is recommended at least twice a year to flush out stagnant water, particulate matter (solids which may include lead), and prevent build up on the pipes (Michigan.gov/SchoolWater for EGLE's *Pre-Flushing Event Guidance for School Plumbing* and *Guidance for Flushing School Plumbing* documents). In some events, the running of water for 30 seconds to 15 minutes every time before consumption/cooking may be appropriate at specific outlets that do not get a lot of daily use. However, this may not be a reliable action to reduce lead risk at that outlet.

PART C: BUILDING WATER SAMPLING INFORMATION AND MAINTENANCE PROGRAMS, CONTINUED	
25. Are there screens or aerators on DWFP fixtures in this building? **26. Is there a routine screen or aerator maintenance program in this building?**	Standard faucets usually have aerators or screens. Many coolers and fountains also have inlet strainer screens. Lead-containing sediments that are trapped on screens can be a significant source of lead contamination. Facilities should create a routine maintenance program to clean the screens regularly. If sediment has been a recurring problem, regular cleaning of the screens and additional investigation of the reasons for the debris accumulation is appropriate. However, the manufacturer or water service provider should be contacted to obtain instructions for cleaning screens. If the building has a routine screen or aerator maintenance program, record how often the screens/aerators are checked and/or replaced/cleaned and explain the maintenance process or attach an SOP to the profile.
27. Are any food preparation fixtures (e.g., kettle fill) or drinking water fixtures connected ONLY to the HOT water pipes?	**Only cold water should be used for drinking or cooking purposes.** If the kitchen kettle fill line is hot water only, it should be replumbed to a cold-water line. Educating the kitchen staff is important to inform them not to use hot water to fill the kettle or pots when preparing food. Hot water in the plumbing system increases the amount of lead and/or copper that is released in the water.
28. Are there known plumbing problems? Look for: stained fixtures; deteriorating pipe/fixtures; discolored water; leaks in the pipe, valves or fixtures; fixtures that have low/no water use or a lower than normal flow of water; dead end piping; valves that will not turn; electrical wires connected to water pipes; and direct connections between the cold-water plumbing and non-drinking water or chemicals. Pay attention to complaints of water bad taste or smell. Record plumbing problems on the *Drinking Water Fixture Inventory* and/or *Individual Fixture Information* form(s) which are available online at Michigan.gov/SchoolWater and set up a schedule to fix the problem.	Plumbing problems can often tell you why you have elevated lead results and what actions to take to reduce the risk of lead and other contaminants in the drinking water. Frequent leaks, rust-colored water, and stains on fixtures, dishes, and laundry are signs of corrosive water. Blue-green deposits on pipes and sinks indicate copper corrosion; brown stains result from the corrosion of iron. Where such symptoms occur, high levels of lead, copper, and iron may be present in the water. Water sitting in pipes and fixtures becomes stagnant with little or no use and can result in poor water quality with elevated amounts of lead, copper and bacteria. Stagnant water may also reside in dead-end pipes and can be “pulled back” into the water supply when back-siphoning occurs. Problems can arise if valves will not turn when plumbing/fixture repairs/replacement are needed. Once the valve is opened, it may knock loose particles that contain lead. These particles may get trapped in faucet aerators or screens. It is important to properly flush the pipes and fixtures after repair/installation to get particles out.

PART C: BUILDING WATER SAMPLING INFORMATION AND MAINTENANCE PROGRAMS, CONTINUED	
28. Are there known plumbing problems? (Continued)	If electrical equipment has been installed using water pipes as a ground, the electric current traveling through the ground wire will accelerate the corrosion of any interior plumbing containing lead. This practice should be avoided if possible. However, if existing wires are already grounded to water pipes, the wires should not be removed from the pipes unless a qualified electrician installs an alternative grounding system. Check with the local building inspector on this matter. State or local building codes may require grounding of the wires to the water pipes. Improper grounding of electrical equipment may cause severe shock. It is important to be aware of cross connections within your facility as contamination can occur when there is a connection between your building's drinking water system (pipes) and another liquid or substance. An example may be a direct connection with a cold-water pipe and a sewer pipe. Cross contamination from backflow of harmful substances may occur as a result of reduced pressure in the drinking water system or because of increased pressure in the contaminating source. Be aware, cross contamination may not be immediately apparent because a contaminant may not have a strong taste, odor, or color. Although lead dissolved in water cannot be seen, tasted, or smelled, the presence of a metallic taste or rusty appearance may indicate corrosion and possible lead contamination.
29. Are renovations planned for the plumbing system?	You should incorporate this information into decisions regarding sample locations and sampling protocol. It may not be necessary to sample fixtures that are going to be replaced if they are taken out of service until the work is done. However, if fixture replacement is part of the renovation, sampling should be done after the new fixture has been properly installed and flushed. The fixture should not be put in service until test results show the water meets water quality standards.

The *School Building Plumbing Profile* document should be reviewed annually and updated as soon as plumbing, sampling or other information/changes are made to keep it a living document.

APPENDIX C: LEAD WATER COOLERS BANNED IN 1988 AND LEAD-LINED TANKS

The LCCA, which amended the SDWA, was signed into law on October 31, 1988 (P.L. 100-572). The potential of water coolers to contribute lead to drinking water in schools and childcare centers was a principal focus of this legislation. Specifically, the LCCA mandated that the CPSC order the repair, replacement, or recall and refund of drinking water coolers with lead-lined water tanks. In addition, the LCCA called for a ban on the manufacture or sale in interstate commerce of drinking water coolers that are not "lead-free." Civil and criminal penalties were established under the law for violations of this ban. With respect to a water cooler that may come in contact with drinking water, the LCCA (Section 1461 of SDWA) defines the term "lead-free" to mean:

> *not more than 8 percent lead, except that no drinking water cooler which contains any solder, flux, or storage tank interior surface which may come in contact with drinking water shall be considered "lead-free" if the solder, flux, or storage tank interior surface contains more than 0.2 percent lead.*

Another component of the LCCA was the requirement that the USEPA publish and make available to the states a list of drinking water coolers by brand and model that are not "lead-free." In addition, the USEPA was to publish and make available to the states a separate list of the brand and model of water coolers with a lead-lined tank. The USEPA is required to revise and republish these lists as new information or analyses become available.

Based on responses to a Congressional survey in the winter of 1988, three major manufacturers (the Halsey Taylor Company, EBCO Manufacturing Corporation, and Sunroc Corporation) indicated that lead solder had been used in at least some models of their drinking water coolers. On April 10, 1988, the USEPA proposed in the Federal Register (54 FR 14320) lists of drinking water coolers with lead-lined tanks and coolers that are not "lead-free." Public comments were received on the notice, and the list was revised and published on January 18, 1990 (Part III, 55 FR 1772). See the following page for a list of water coolers and lead components included on that list.

Important Note: The 1990 list is based on a definition of "lead free" in SDWA applicable to drinking water coolers only (SDWA Section 1461). At the time it was enacted, the 8 percent standard of the definition was the same as the definition of lead free in another section of SDWA applicable to pipes, pipe fittings, plumbing fittings and fixtures, solder, and flux (SDWA Section 1417). Since then, however, the definition of "lead free" for pipes, fittings, and fixtures in Section 1417 was changed as a result of the 2011 Reduction of Lead in Drinking Water Act to a weighted average of 0.25 percent of the wetted surface. **It is still important to test fixtures that are not on this list, especially if they were installed prior to 2014, the year the Reduction of Lead in Drinking Water Act became effective.**

APPENDIX C CONTINUED: LEAD WATER COOLERS BANNED IN 1988 AND LEAD-LINED TANKS

LIST OF WATER COOLERS AND LEAD COMPONENTS

EBCO MANUFACTURING

All pressure bubbler water coolers with shipping dated from 1962 through 1977 have a bubbler valve containing lead. The units contain a single 50-50 tin-lead solder joint on the bubbler valve. Model numbers for coolers in this category are not available.

The following models of pressure bubbler coolers produced from 1978 through 1981 contain one 50-50 tin lead solder joint each:

CP3	DP15W	DPM8	7P	13P	DPM8H	DP15M	DP3R	DP8A
DP16M	DP5S	C10E	PX-10	DP13SM	DP7M	DP7MH	DP7WMD	
WTC10	DP13M-60	DP14M	CP10-50	CP5M	DP15MW	DP3R	DP14S	
DP20-50	DP7SM	DP10X	DP13A	EP10F	DP5M	DP10F	CP3H	
CP3-50	DP13M	DP3RH	DP5F	EP5F	13PL	DP8AH	DP13S	
CP10	DP20	DP14A-50/60						

HALSEY TAYLOR

Lead solder was used in these models of water coolers manufactured between 1978 and the last week of 1987:

WMA-1	SCWT/SCWT-a	SWA-1	DC/DHC-1
S3/5/10D	BFC-4F/4FS/7FS	S300/500/100D	

The following coolers manufactured for Haws Drinking Faucet Company by Halsey Taylor from November 1984 through December 18, 1987, are not lead-free because they contain two tin-lead solder joints. The model designation for these unites are as follows:

HC8WT	HC14F	HC6W	HWC7D	HC8WTH	HC14FH	HC8W	HC2F	HC14WT
HC14FL	HC14W	HC2FH	HC14WTH	HC8FL	HC4F	HC5F	HC14WL	HCBF7F
HC4FH	HC10F	HC16WT	HCBF7HO	HC8F	HC8FH	HC4W	HWCZ	

Source: USEPA

LEAD-LINED TANKS

Prior to publication of the January 1990 list, the USEPA determined that Halsey Taylor was the only manufacturer of water coolers with lead-lined tanks. Below provides a listing of model numbers of the Halsey Taylor drinking water coolers with lead-lined tanks that had been identified by the USEPA as of January 18, 1990.

Based upon an analysis of 22 water coolers at a United States Navy facility and subsequent data obtained by the USEPA, the USEPA believes the most serious cooler contamination problems are associated with water coolers that have lead-lined tanks.

Since the LCCA required the CPSC to order manufacturers of coolers with lead-lined tanks to repair, replace, or recall and provide a refund of such coolers, the CPSC negotiated such an agreement with Halsey Taylor through a consent order published on June 1, 1990 (at 55 FR 22387). The consent agreement calls on Halsey Taylor to provide a replacement or refund program that addresses all the water coolers listed below as well as "all tank-type models of drinking water coolers manufactured by Halsey Taylor, whether or not those models are included on the present or on a future USEPA list." Under the consent order, Halsey Taylor agreed to notify the public of the replacement and refund program for all tank type models.

Currently, a company formerly associated with Halsey Taylor, Scotsman Ice Systems, has assumed responsibility for replacement of lead-lined coolers previously marketed by Halsey Taylor. If a school or childcare facility has one of the Halsey Taylor water coolers noted below, contact Scotsman Ice Systems to learn more about the requirements surrounding its replacement and rebate program.

Scotsman Ice Systems
775 Corporate Woods Parkway Vernon Hills, IL 60061
PH: (800) SCOTSMAN or 800-726-8762
PH: (847) 215-4500

HALSEY TAYLOR WATER COOLERS WITH LEAD-LINED TANKS

The following six model numbers have one or more units in the model series with lead-lined tanks:

WM8A	WT8A	GC10ACR	GC10A	GC5A	RWM13A

The following models and serial numbers contain lead-lined tanks:

WM14A Serial No. 843034	WM14A Serial No. 843006	WT11A Serial No. 222650
WT21A Serial No. 64309550	WT21A Serial No. 64309642	LL14A Serial No. 64346908

Source: USEPA

APPENDIX D: WORKSHEET EXAMPLES

FOUNTAINS/DRINKING WATER COOLERS ON THE USEPA'S RECALL LIST

This worksheet is to be used to document water coolers found in the building to make sure they are taken out of service.

SCHOOL BUILDING NAME:				
DATE IDENTIFIED:				
Floor plan sequence # or building location	**Make**	**Model**	**Taken out of Service (date)**	**Initials**
Additional Comments:				

DRINKING WATER FIXTURE INVENTORY SPREADSHEET

This worksheet may be used for field notes during the building walk-through to record all fixture information and the sequence of fixture sampling. A more detailed worksheet template is available at Michigan.gov/SchoolWater. This information may then be transferred to the *Individual Fixture Information Worksheet* (example shown on the next page).

DRINKING WATER FIXTURE INVENTORY SPREADSHEET FOR YEAR:

BUILDING NAME:

Seq # on floor plan	**Fixture ID** (individual code)	**Tap Type**	**Pipe Type**	**Brand Make Model #**	**Chiller Unit?**	**Aerator or Screen?**	**Filter?**	**Motion Activated?**	**Discolored Water**	**Leaking**	**Notes:** (is it working, only connected to hot water pipe, etc.)

KEY

Tap Type:

B - Bubbler (drinking fountain without a chiller unit)
DFC - Drinking fountain w/chiller
CF - Classroom faucet
NS - Nurse's sink
DW - Dishwasher
TL - Teacher lounge
WC - Water cooler (drinking fountain w/chiller and reservoir)
KS - Kitchen sink
KK - Kitchen kettle
IM - Ice machine
BF - Bathroom faucet
DM - Drink machines

Pipe Type: (connective plumbing material to tap)

L - Lead
C – Copper
G - Galvanized
P - Plastic/Pex
SS - Stainless steel
UN - Unknown

INDIVIDUAL FIXTURE INFORMATION WORKSHEET

SCHOOL BUILDING NAME: _____ **DATE:** _____

FIXTURE TYPE:
☐ Bubbler ☐ Drinking fountain ☐ Water cooler ☐ Classroom faucet ☐ Kitchen faucet ☐ Kitchen kettle ☐ Nurse's sink
☐ Ice machine ☐ Drink machine connected to water supply (coffee/juice/pop) ☐ Faucet used to fill athletic jugs ☐ Other_____

FIXTURE ID NUMBER	**SAMPLING SEQ #**	**AERATOR/SCREEN?** ☐ YES ☐ NONE	**CONNECTING PLUMBING** ☐ Brass connection ☐ Brass fittings ☐ Brass valves ☐ Brass T ☐ Copper with lead solder ☐ Copper with 95/5 solder ☐ Stainless ☐ Plastic ☐ Nylon / PEX ☐ Inaccessible/Not marked
PHOTO NUMBER(S)		**FILTER?** ☐ YES ☐ NONE	
BRAND/MODEL NUMBER IF KNOWN ☐ Inaccessible or not marked		**OTHER INFO** ☐ Motion activated ☐ Leaking/dripping ☐ Wear/discoloration ☐ Discolored water ☐ Cold runs hot ☐ Not working – do not label the tap for sampling	**NOTES** (when the fixture was installed/replaced, etc.)

It is recommended to attach or affix a label (sticker) at the fixture or under the sink with the fixture ID number or sampling sequence number.

This School Building Plumbing Profile document was developed in part with excerpts and information from the USEPA's *3T's for Reducing Lead in Drinking Water in Schools and Child Care Facilities* (September 2018) and *Drinking Water Best Management Practices for Schools and Childcare Facilities Served by Municipal Water Systems* (April 2013).