

Lead in Drinking Water

Program for Schools and Child Care Facilities



Lead in Schools Program

- Since 1988 the Massachusetts Department of Environmental Protection, Drinking Water Program (DWP) has taken a proactive stance in attempting to eliminate lead from drinking water. Specific attention has been given to schools due to the effects on children. Our “Lead in Schools” initiative is continuously being updated and improved in an attempt to integrate the good work of all the stakeholders involved in public health protection with those who provide services to the children of the Commonwealth.



DWP- Lead in Schools Program

- Strategic plan, working with all stakeholders
- Revise and update sampling recommendations
- Distribute outreach material to school administrators, schools and child care facilities
- Develop a collaborative curriculum for lead abatement education in schools
- Training programs to involve staff members in collecting samples and efforts to reduce lead levels



Stakeholders

- MassDEP
- MA Department of Public Health (DPH)
- MA Department of Elementary and Secondary Education (DESE)
- MA Department of Early Education and Care (EEC)
- Schools and child care facilities of the Commonwealth
- Public Water Systems (PWS)
- EPA New England Office



Recent Legislation

- California “lead-free” legislation went into effect January 1, 2010. Lead free pipes means less than 0.25% weighted average.
- Similar law passed in Vermont, Maryland
- National level, June 2010- House subcommittee passes bill on lead free plumbing fixtures, adopting the stricter 0.25% California standard.
- National legislation currently under review in House Energy and Commerce Committee



Health Effects of Lead

- Most severe in children
- Impairs mental and physical development
 - IQ deficits
 - Shortened attention span, symptoms of ADHD
 - Hearing damage
 - Poor classroom behavior/performance
 - Antisocial personality
 - Stunted growth
 - Lowered birth weight



Health Effects of Lead

- CDC threshold of concern: 10 $\mu\text{g}/\text{dl}$
- In 2005, CDC said there was no safe level of lead exposure in children
- “Regardless of the amount, the presence of lead in [food and water] should be a reason for concern, since they could potentially add to exposure from other sources of the neurotoxin in a child's environment.”

(Article in TIME Health & Science, March 2010)



Health Studies

- “Low-level lead exposure, including prenatal exposure, has been linked to decreased performance on standardized IQ tests and end-of-grade testing for school-aged children.”

(The Children's Environmental Health Initiative, CEHI at Duke University)

- Lead linked to ADHD symptoms

(Study by Joel Niggs for Journal of Child Psychology and Psychiatry)

- Lead increases risk factor for criminal activity

(Article in May 2009 issue of PLoS Medicine)

- Detroit Public Schools Case Study



Adverse Impacts of Lead

- “Economists estimate the health impact of human lead exposure costs more than \$43 billion annually in lost time at work, [school], health-care costs and related expenses.”

(Washington Post article, May 19 2010)



Lead and Drinking Water

- Health risks associated with lead paint and gasoline have been well publicized, but children can also be exposed to unsafe levels of lead in tap water.
- On-again, off-again patterns (i.e. weekends and school vacations) of drinking water use in schools increase risk of elevated lead especially at first draw



Lead and Drinking Water

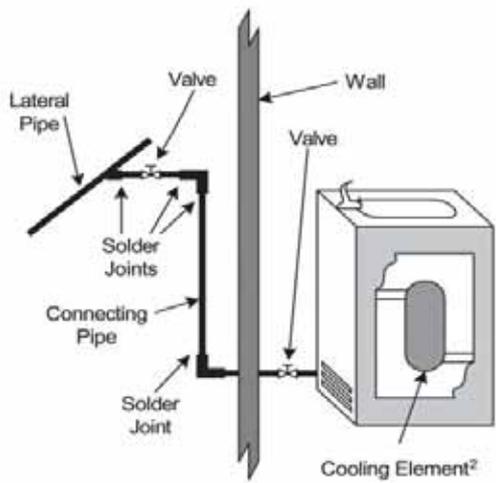
- On average, it is estimated that lead in drinking water contributes between 10 and 20 percent of total lead exposure in young children.
- MassDEP action level for lead in school drinking water: 0.015 mg/L



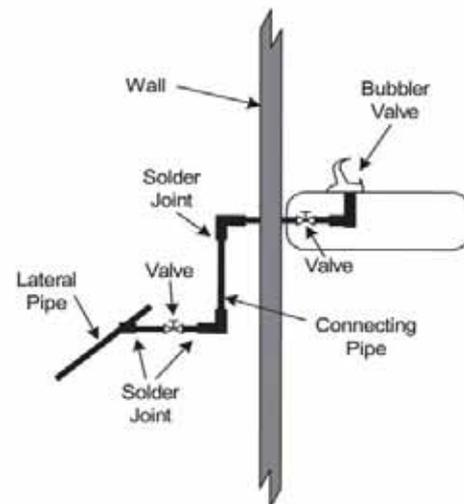
Sources of Lead in Drinking Water

- The amount of lead, if any, in a plumbing system will depend on the age of the system and the materials from which the system was constructed.
- Lead service lines
- Corrosion
- Pipes- historically made of lead
- Drinking water coolers and bubblers
- Individual outlets and fixtures (taps, fountains, ice making machines, kettles)

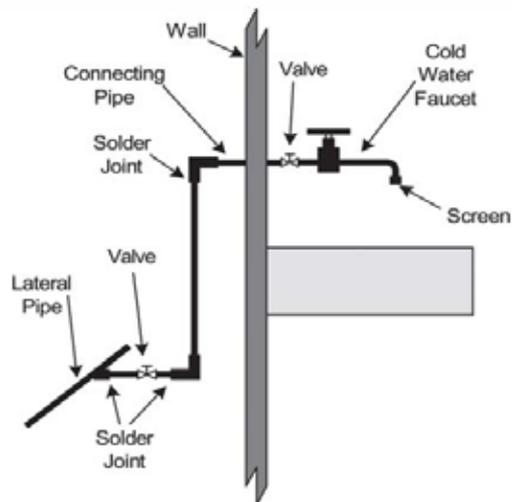




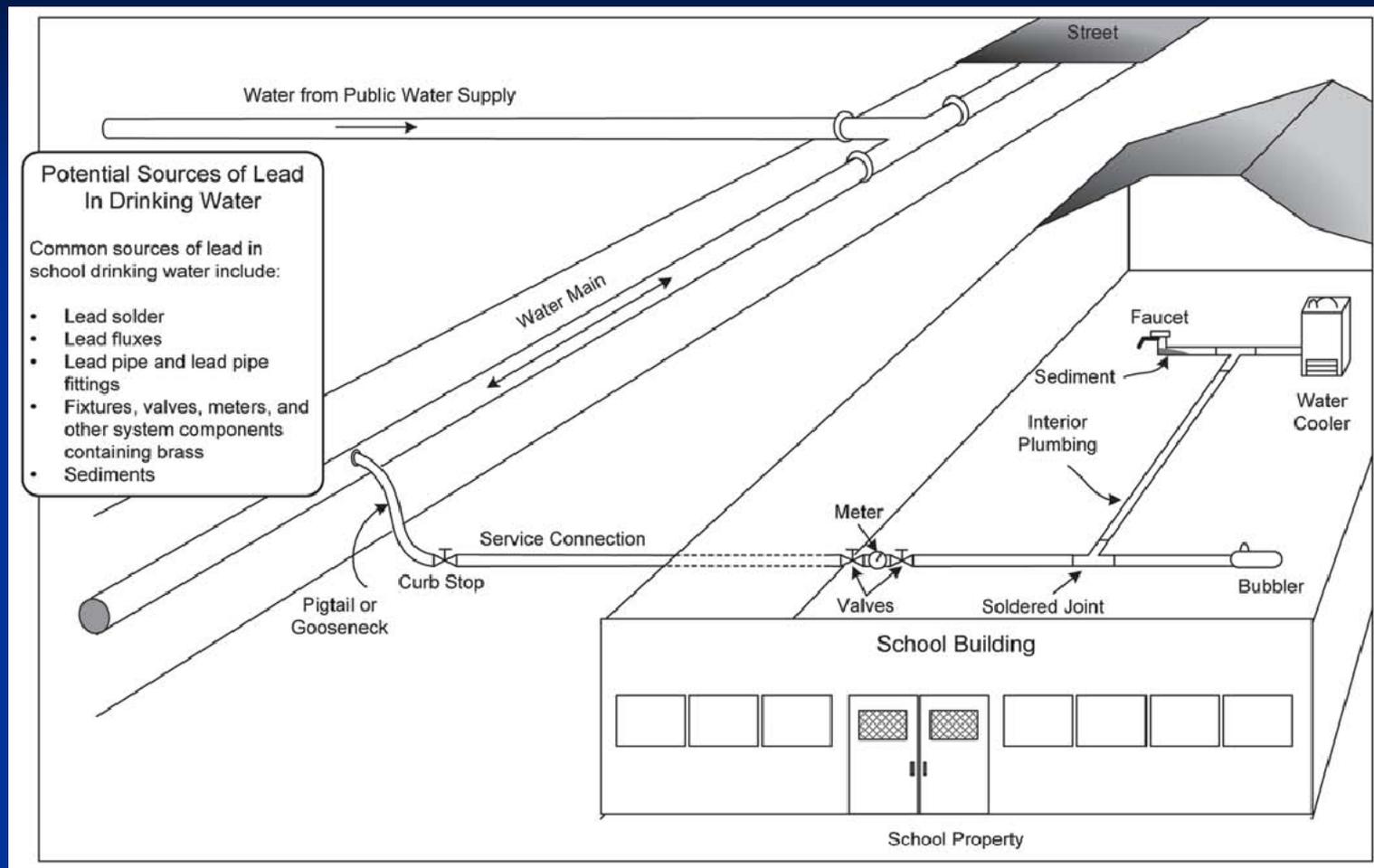
Water Cooler



Bubbler



Cold Water
Faucet (Tap)



Lead Service Lines

- When lead service lines are completely or partially removed and replaced, outlets at individual locations along the main water line are at greater risk for elevated lead levels.

(American Water Works Association)

- The MassDEP recommends having your facility tested for lead if pipes in the main service line have recently been removed or replaced. Contact your PWS for this information.



Testing for Lead

- According to the LCR, public water suppliers must test for lead twice a year, taking 2 samples each from 2 schools.
- If your school has been sampled by the PWS and has lead levels above the action level, the results come to the MassDEP and we require the school to submit a plan for addressing the elevated levels, including re-sampling.

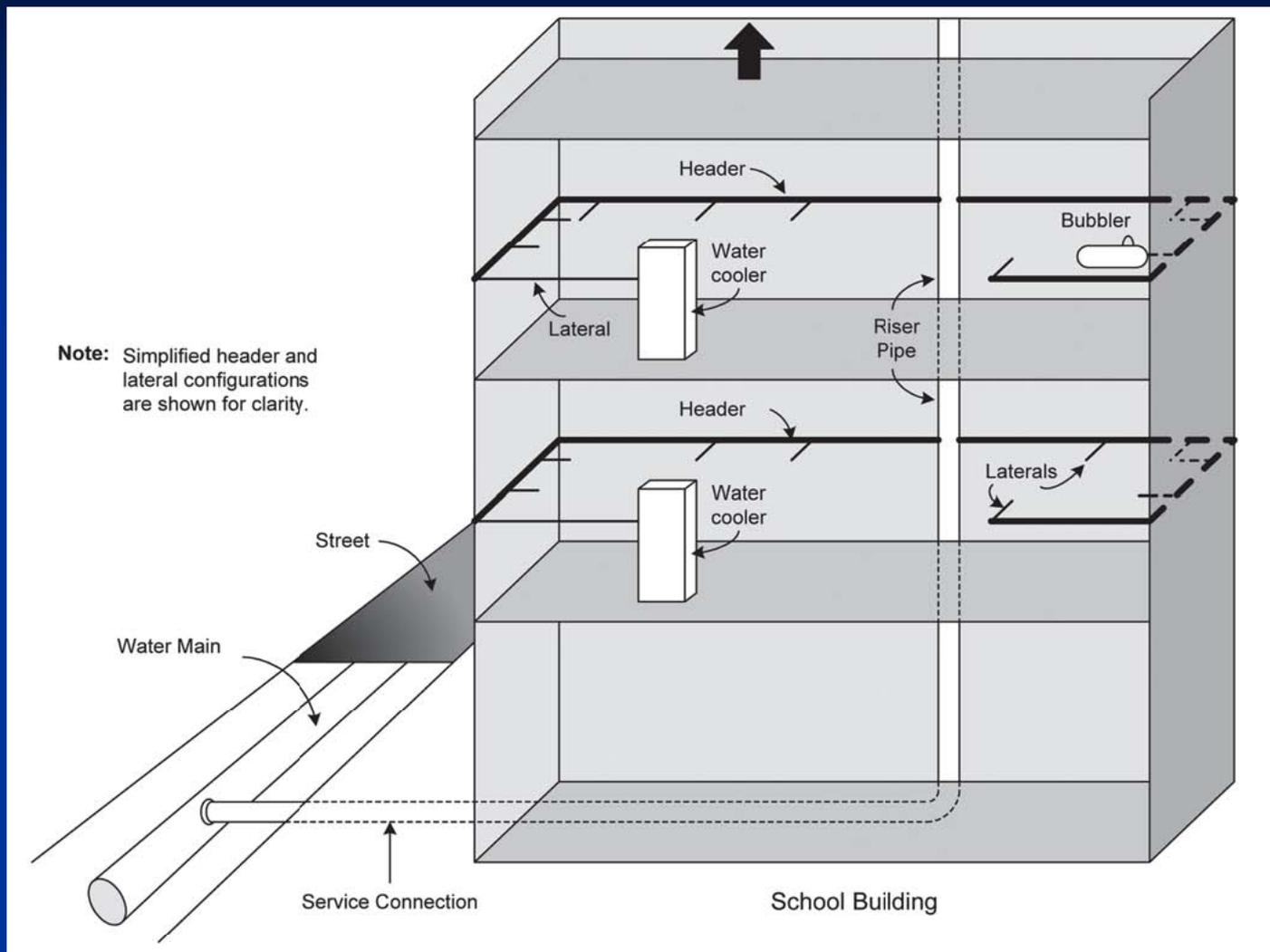


Plumbing Profile

- Keep an up-to-date profile of your facility (separate map for all buildings and renovations) to help identify high-risk areas for lead.
- Note areas of the building that receive water first, and areas that receive water last
- Identify what materials were used in the service connection that carries water to the school from the PWS main line
- Identify materials used for potable water pipes and drinking fixtures.



Plumbing Configuration for a Multi-Level Building



Sampling Plan for Lead

- Sample all fixtures every 3-5 years
- Collect additional samples immediately following replacements or removal of pipes on the main water line or fixtures in your facility
- Inform the school community (staff, parents, local officials, etc) before and after all samples have been gathered and tested
- Involve staff and students in sampling efforts! This may include custodial staff, science teachers and students



Collecting Samples

High priority:

- drinking fountains, both bubbler and water cooler style
- kitchen sinks
- classroom combination sinks and drinking fountains
- home economic rooms sinks
- teacher's lounge sink, nurse's office sink
- classroom sinks in special education classrooms
- any sink known to be or visibly used for consumption (e.g. coffee maker or cups are nearby)

Medium priority:

- classroom sinks (potential for cups used for drinking, classroom cooking projects)
- bathroom faucets (yes, many kids drink from these!)

Low priority:

- utility sinks and hose attachments, unless used to fill water jugs (e.g. for sports team practice)
- hot water outlets

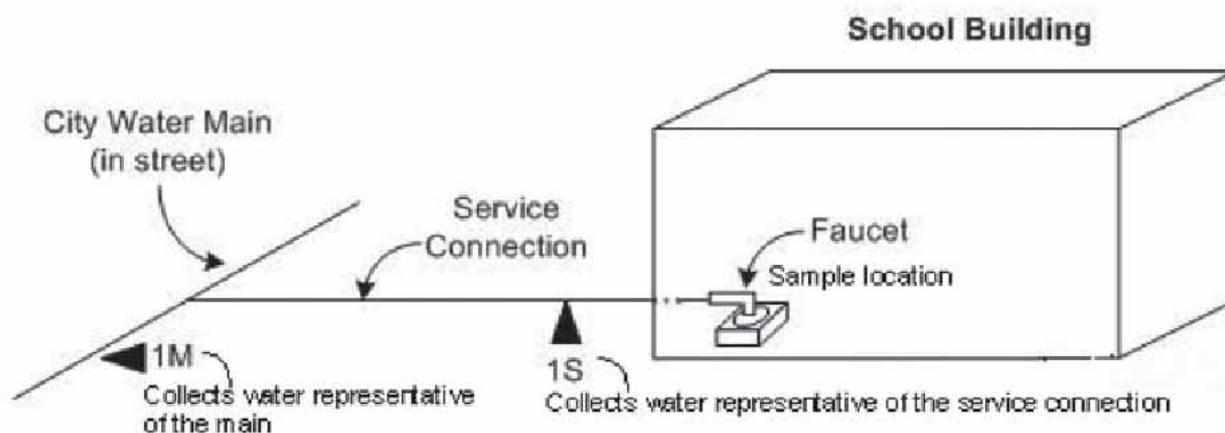


Collecting Samples

- Water samples from the tap will have to be collected and sent to a certified laboratory for analysis.
- When collecting the samples yourself, make sure you follow the lab's instructions exactly.
- Be certain to take a "first draw" and a "fully flushed" 250 mL sample.
- Re-sample any fixtures with lead above the action level. If the fixture has an aerator, re-sample without aerator.



Sample Collection Procedures



Targeted Locations of Water in Plumbing
for Samples 1S & 1M

Communicating Results

- Inform the parents, staff, etc. in your school community as well as the MassDEP of sample results. See our website for a sample letter to parents:

<http://www.mass.gov/dep/water/drinking/smplltr.htm>

- Sharing information– via letters to the school community throughout the testing program AND reporting results to the MassDEP– is “proactive”.
- Avoid problems before they arise rather than managing them once they happen by practicing good record-keeping and reporting habits.
 - Assign sample IDs, date all samples



Lead Maintenance Checklist

- The MassDEP has developed a new Lead Maintenance checklist for all schools and child care facilities to identify areas at risk for elevated lead levels.
- You should be receiving the checklist by **email** with updated lead outreach material.
- Please complete and return the checklist by September 30, 2010 so we can compile an accurate statewide database and better assist schools with their lead programs.



Lead Abatement Education Curriculum

- Include clean drinking water topics in science curriculums and incorporate students in conducting samples.
- MassDEP and EPA New England are working together to develop a training program for custodial staff.
- Goal: staff are informed about the internal plumbing of the facility and associated health risks due to lead and can therefore take appropriate action when necessary.



What To Do If Elevated Lead Levels are Detected

- Discontinue use from those fixtures until they can be removed and replaced

- Visit Technical Assistance website for guidance:

<http://www.mass.gov/dep/water/drinking/leadothe.htm#leadcop>

- Contact Drinking Water Program:

- Program.Director-DWP@state.ma.us

- 617- 292-5770



Remediation Actions

- Interim Measures:
 - Flushing
 - Provide bottled water
 - Shut off problem outlets
- Long term measures:
 - Have all lead fixtures, pipes, etc permanently removed and replaced with lead-free materials
 - <http://media.wattswater.com/S-LeadFree.pdf>
 - Install time-operated solenoid valves to automatically flush problem outlets
 - Install point-of-use (POU) filters
 - Check ground wires and eliminate any that may accelerate corrosion of lead



Remediation Actions

- EPA recommends that if you choose to install a filter, it has been certified to remove lead by either NSF International or the Water Quality Association.
 - <http://www.nsf.org/>; <http://www.wqa.org/>
- By installing a filter you may become a Public Water Supplier



Lead Free Materials

- Additional resources:
 - “We are lead free” website- Home of the Lead Free Plumbing movement, lead free news from around the country and lead free product information:
 - <http://www.weareleadfree.net/default.asp>
 - Established by Watts Water Technologies
 - Green Plumbers



Case Study- Stoughton

- Test results indicated that lead exceeded the action level of 15 ppb and this was picked up by the press.
- Stoughton school district contacted the MassDEP for assistance, put a remediation plan and outreach program in place.
- Stoughton school district now works closely with the MassDEP to create sampling plans and protect their drinking water supply.



Good Practices

- Flushing
 - Several drinking water outlets daily
 - Pipes only after weekends and vacations
- Never use hot water for cooking or food preparation
- Establish partnerships with other schools, health groups, and your local water supplier for updates and advice on testing and maintenance



Guidance Material

- EPA's 3Ts (Training, testing, and telling) toolkit for reducing lead in drinking water
http://www.epa.gov/ogwdw000/schools/pdfs/lead/toolkit_leadschools_guide_3ts_leadschools.pdf



MassDEP Drinking Water Program



Top 3 Things To Do

- 1. Use lead free materials in any plumbing fixture!
- 2. Do not use fixtures where elevated lead levels exist!
- 3. Complete and return the Lead Maintenance Checklist by September 30!

