

Michigan School Water Training Program: Know Your Plumbing System and How to Develop an Investigative Drinking Water Sampling Plan

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Today's Talk

- Identifying drinking water plumbing in a school building
- Conducting a plumbing system survey
- Developing a plumbing profile
- Creating a water sampling plan

Michigan School Water Training Program (SWTP)

- To promote quality drinking water in school buildings & protect public health
- A partnership between MDE, MDEQ, DLARA
- Provide instruction, training and guidance materials
- A voluntary, proactive activity for schools on community water



Key Messages



- Quality drinking water is important
- A breach in plumbing may introduce contaminants
- A plumbing profile is essential for quick corrective actions & the development of a drinking water sampling plan

Identifying Lead in the Drinking Water System

Knowing...

- Potential sources
- How lead gets into drinking water
- Lead in drinking water regulations
- Who to contact for help

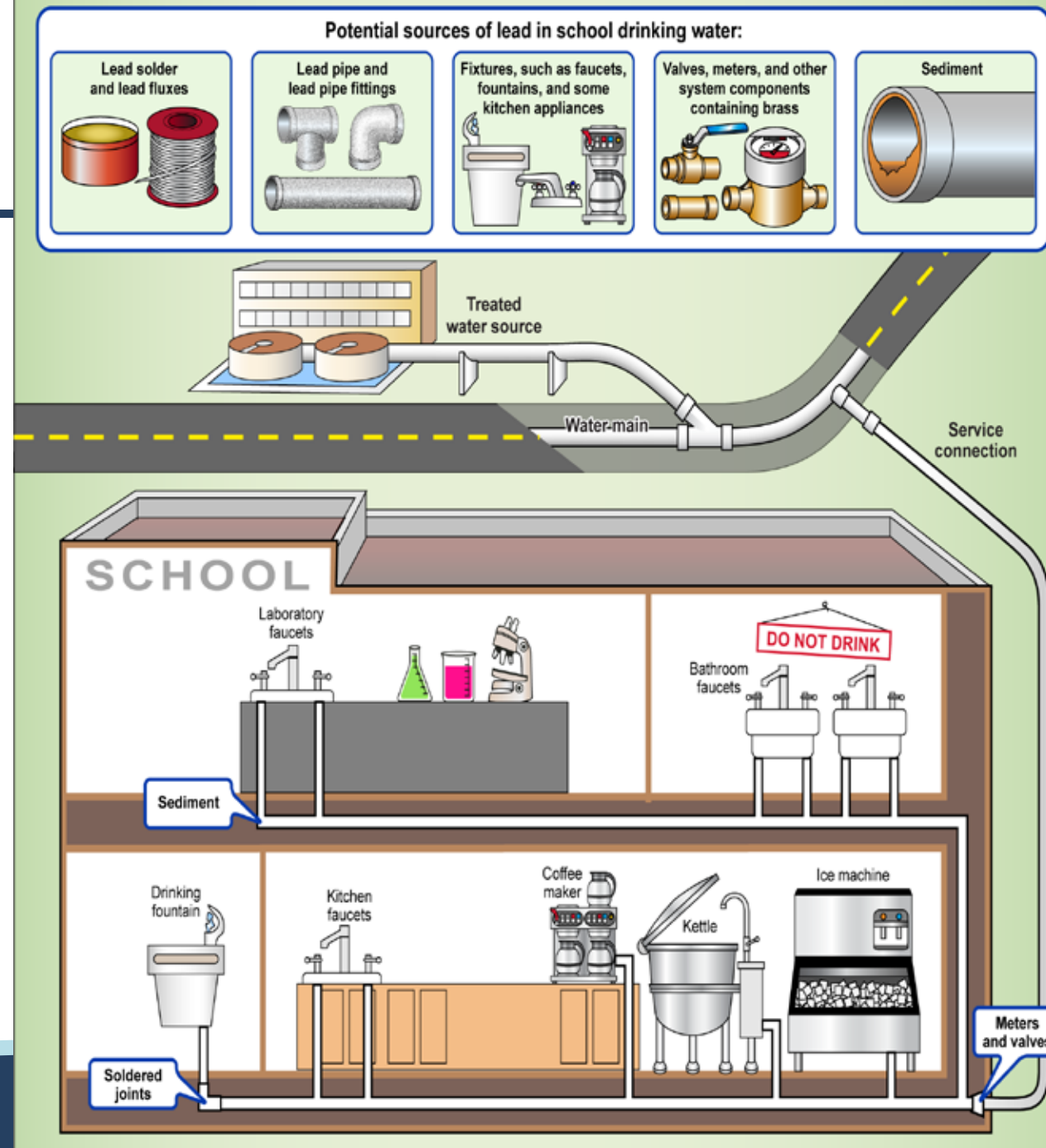
Currently go to: www.michigan.gov/drinkingwater
click on *School Drinking Water Training Program*

Quick link coming soon: www.michigan.gov/schoolwater



Potential Sources of Lead in Drinking Water

- Lead water service line
- Lead pipes in plumbing
- Copper pipes joined by lead solder
- Brass pipes, faucets, fittings & valves
- Sediments in pipe or tap screens
- Water fountains with lead lined tanks



How Lead Gets into Drinking Water

- “Soft” water
- Water velocity
- Temperature
- Alkalinity
- Chlorine levels
- Grounding of electrical wiring to water pipes
- Age & condition of plumbing
- Amount of time water is in contact with plumbing



Lead in Drinking Water Regulations

1986
Lead Ban

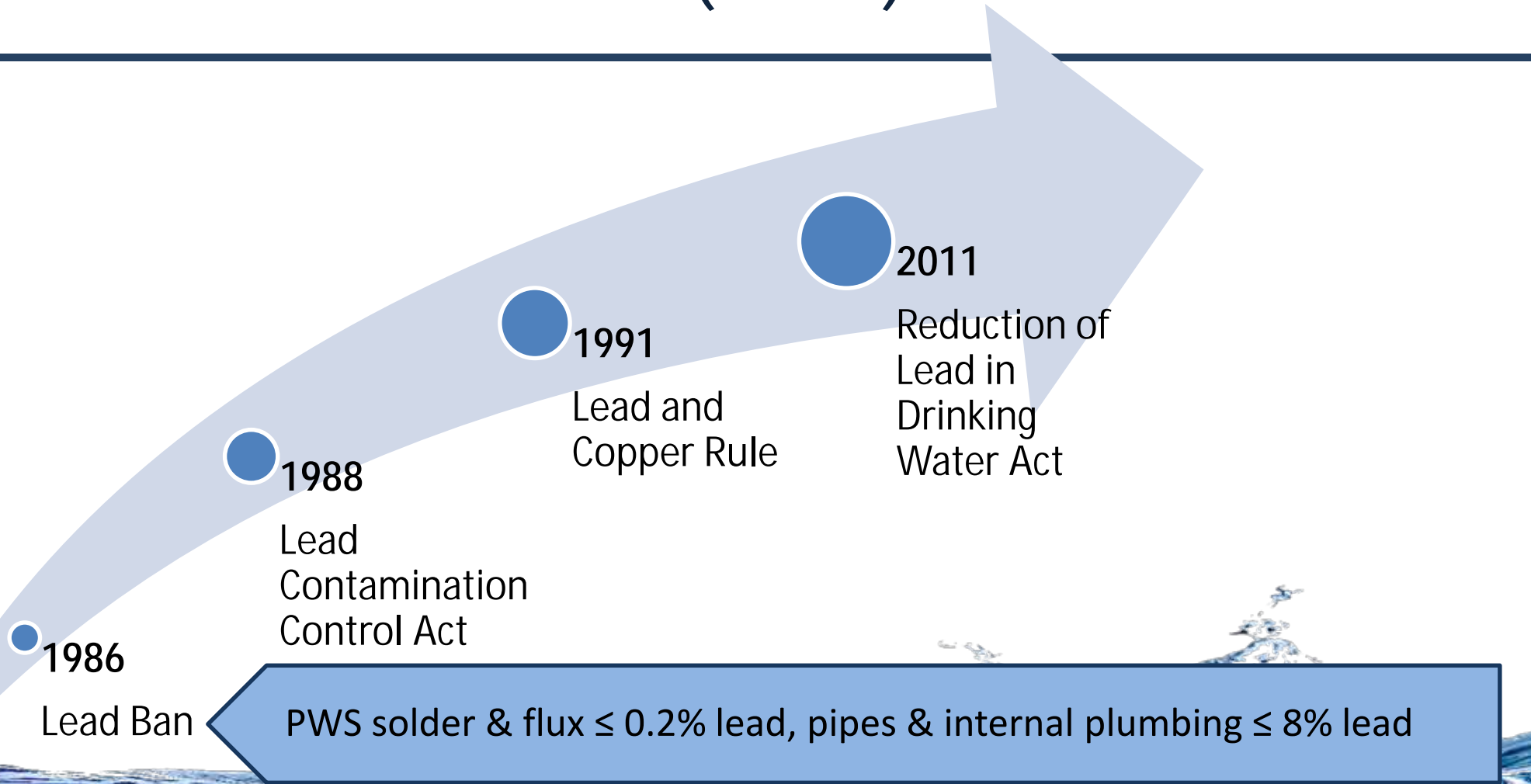
1988
Lead Contamination Control Act

1991
Lead and Copper Rule

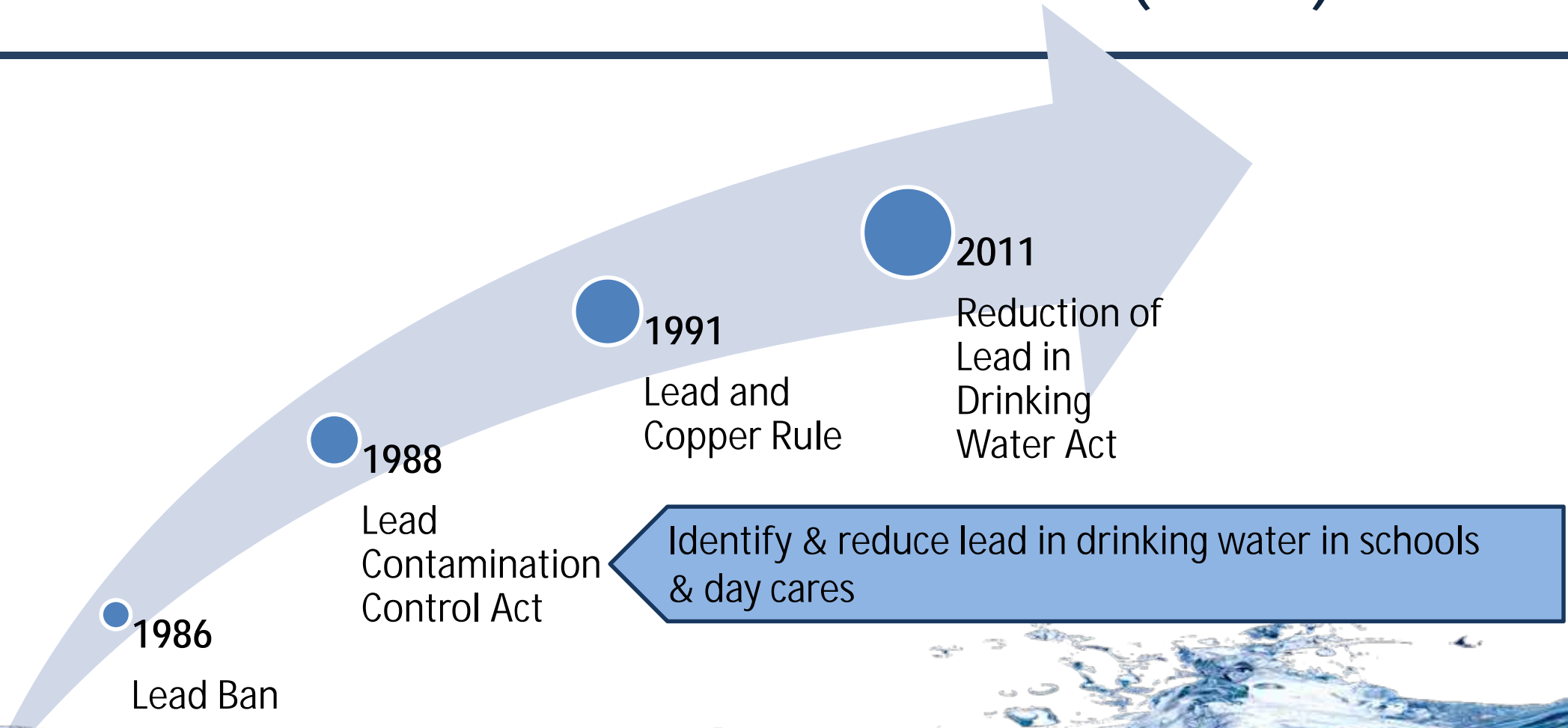
2011
Reduction of Lead in Drinking Water Act



Lead Ban (1986)



Lead Contamination Control Act (1988)



Lead and Copper Rule (1991)

PWS's must evaluate & reduce corrosiveness of water

1986
Lead Ban

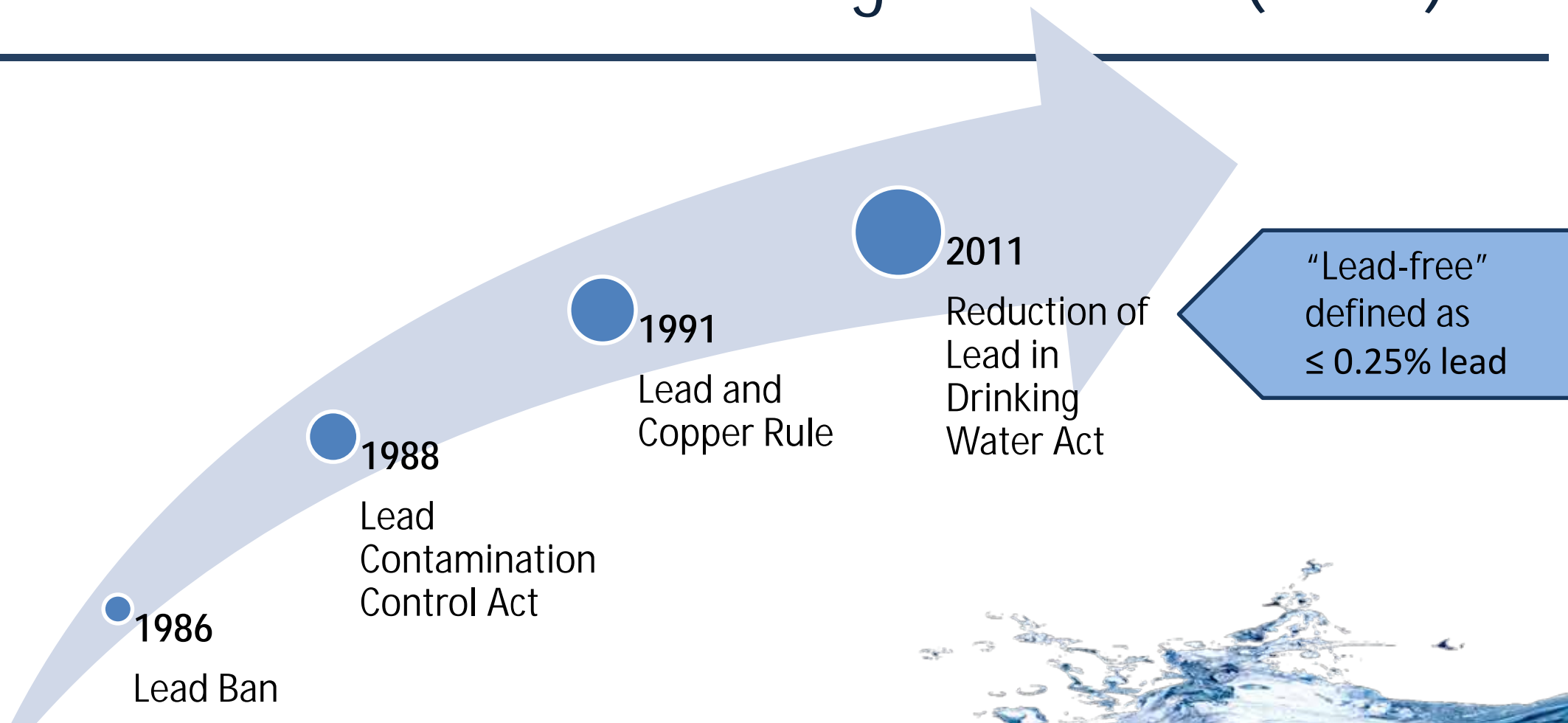
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Reduction of Lead in Drinking Water Act



Reduction of Lead in Drinking Water Act (2011)



“Lead-free”
defined as
 $\leq 0.25\%$ lead



Developing a Plumbing Profile

- Graphical or other representation of information relating to the characteristics of the drinking water system
- Essential part of an overall program to identify high risk areas for bacteria, lead and/or copper
- Essential for properly moving the water in the plumbing system



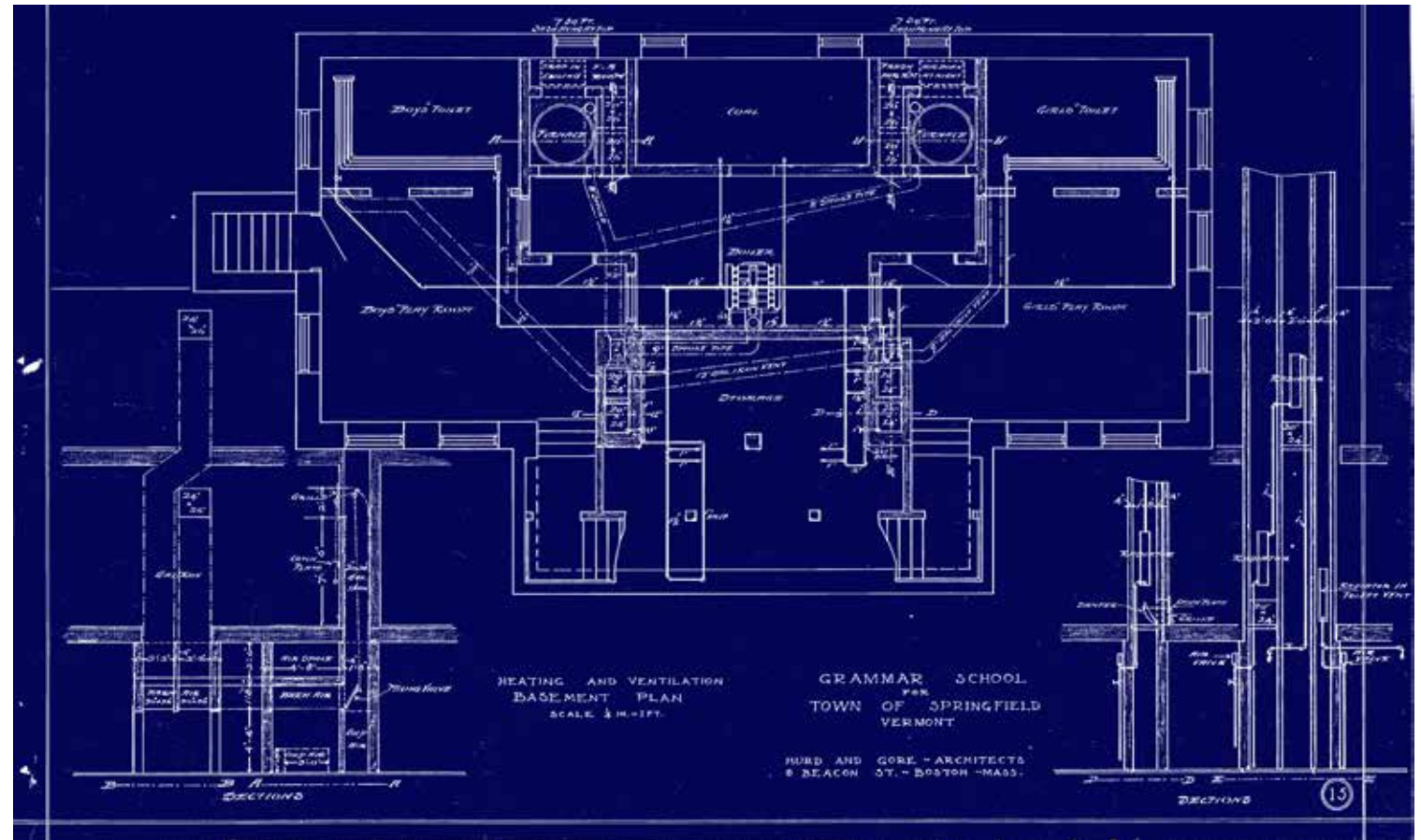
Building Plumbing Survey

- q Review available records
- q Conduct a building walkthrough
- q Document your findings
 - Flow of drinking water through the building
 - Plumbing materials
 - Recalled water coolers not yet removed
 - Sampling sites
 - Leaks, corrosion, particles on screens, electrical wires grounded to pipes, etc.



Review Available Records

- Building permits
- Blueprints
- Plumbing permits
- As-built plans
- Other information

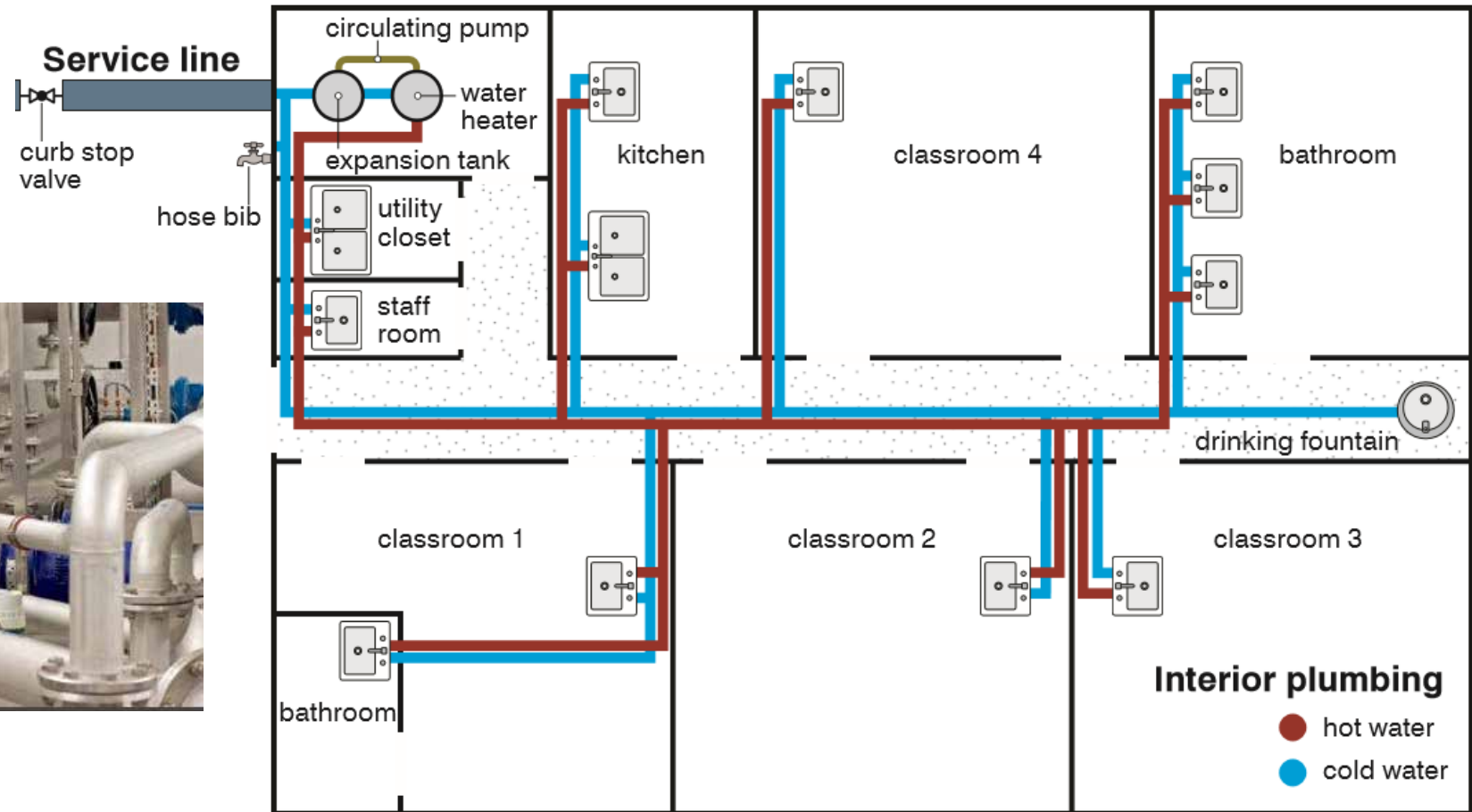


Review Available Records

- When was the school built?
- Building additions or renovations?
- New plumbing installations?
- Previous water sampling results?



Conduct a Building Walkthrough



Source: Environmental Defense Fund

School Plumbing System Components



What is the Service Line Material?



Plastic – PEX, Polyethylene or HDPE



Lead



Galvanized



What is the Pipe Material?

- Color/Appearances
 - Copper color
 - Bright or dull gray
 - Rust
- Magnetic Properties
 - Copper & Lead – no magnetic attraction
 - Galvanized – MAY have magnetic attraction
- Scratch Test
 - Scratch with screwdriver or file
 - Care must be taken not to gouge a fragile pipe too deeply

*Note - A little bit of paint may result in changes in appearances or magnetic properties.



Lead Pipe

- A magnet will not stick to a lead pipe.
- Scratch the pipe with a coin. If the scraped area is shiny silver and flakes off, the service line is lead.



Copper Pipe

- A magnet will not stick to a copper pipe.
- Scratch the pipe with a penny. If the scraped area is copper in color, like a penny, your service line is copper.



Galvanized Steel Pipe

- If a magnet sticks to the surface, your service line is galvanized steel.
- A scratch test is not needed. If you scratch the pipe, it will remain a dull gray.

Lead Swabs

- A tool for identifying plumbing material
- Instant check for lead solder in pipes



Older Tanks in the Plumbing System?

- Pressure tanks
- Gravity storage tanks



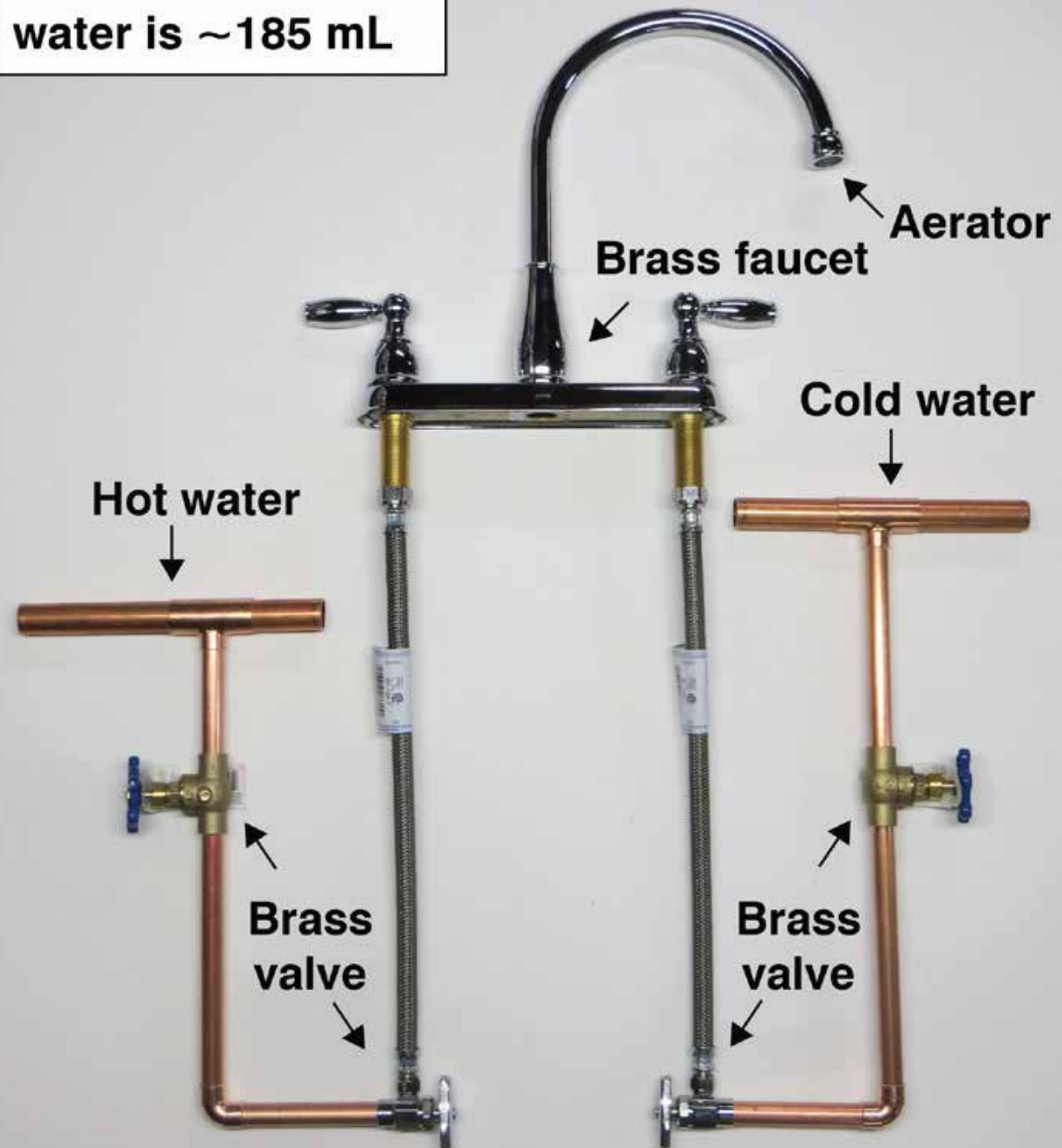
Any Brass Fittings, Faucets or Valves?

- Most faucets are brass on the inside
- Golden yellow in color, similar to copper, or plated w/chrome
- Brass is composed primarily of 2 metals – copper & zinc
- Contain some lead
- Use certified products



Certified to
NSF/ANSI 61

Volume of cold
water is ~185 mL



Fixtures With Aerators or Screens?

- Standard faucets usually have screens
- Many coolers and bubblers also have screens
- Lead containing sediments may become trapped on screens
- Cleaning is important



Any Banned Drinking Fountains?



Can You Detect Signs of Corrosion?

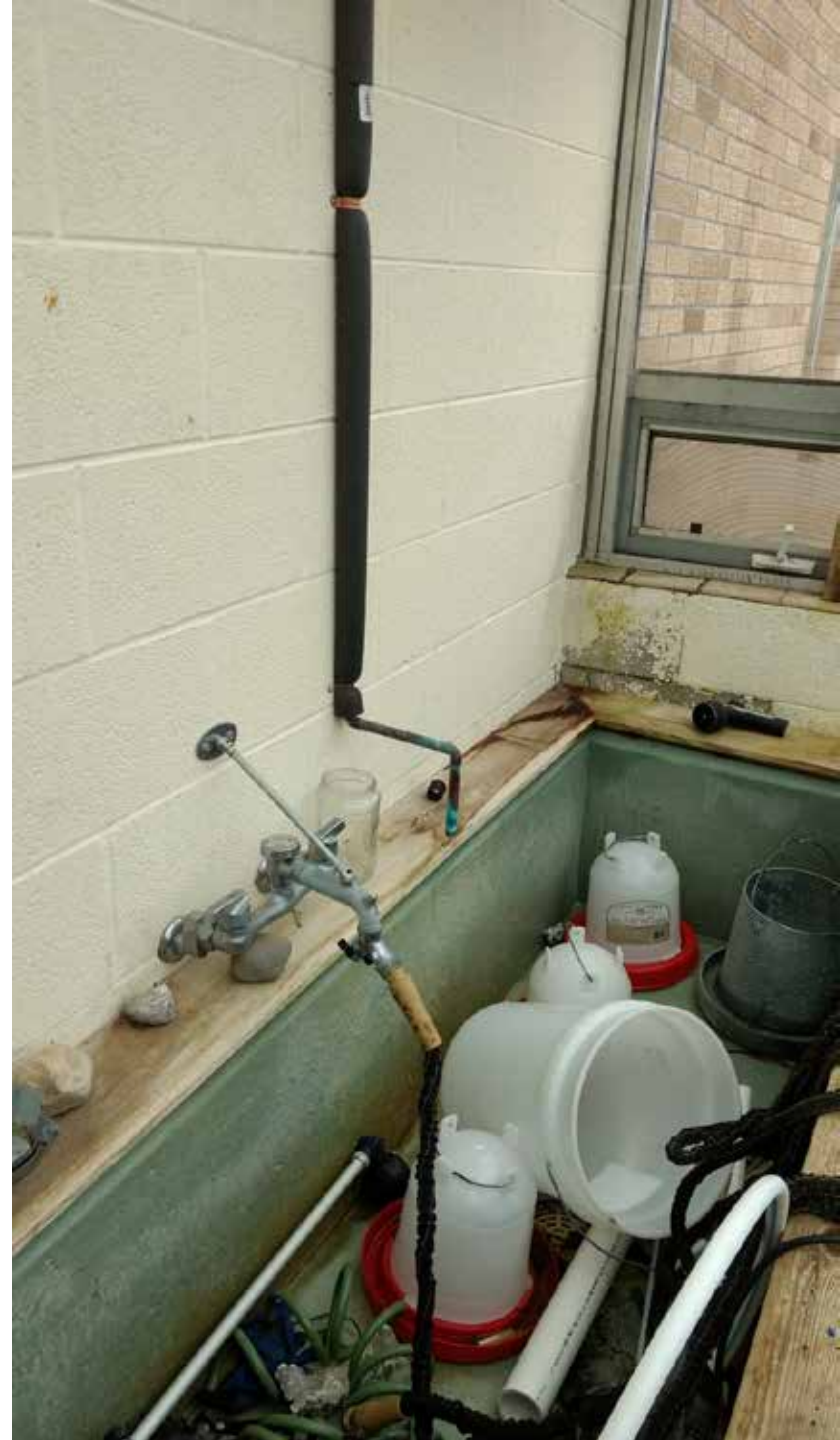
- Frequent leaks
- Rust-colored water
- Stained dishes or laundry



Any Other Problem Areas?

- Dead ends
- Low/no use areas





Electrical Equipment Grounded to Water Pipes?

- Telephones
- Computers
- Have a qualified electrician fix this



Any Drinking Water Complaints?

- Taste
- Color
- Smell



A Plumbing Profile Should Include

- q Year school built & dates of any additions
- q Building blueprints and floor diagrams
- q Service line material
- q Material of internal plumbing
- q Point of entry or point of use treatment being used
- q All drinking water outlets (Drinking Water Outlet Inventory Form)
 - q including fountains that are permanently or temporarily out of service & those leaking & need of repair
- q Type (make & model) & location of all drinking water fountains
- q Locations of all drinking water outlets and drinking fountains
- q All plumbing repairs & replacements needed for internal plumbing
- q All plumbing repairs & replacements conducted within the past year
- q Locations of any electrical wires grounded to water pipes
- q The flow of cold water through the building to each fixture

Water Outlet Inventory

- Document individual fixture location & information
- Take digital photos
- Include date of survey



APPENDIX A INDIVIDUAL FIXTURE ASSESSMENT

SAMPLE NUMBER	SEQ #	AERATOR/SCREEN? <input type="checkbox"/> Yes <input type="checkbox"/> None	CONNECTING PLUMBING <input type="checkbox"/> Brass connection <input type="checkbox"/> Brass fittings <input type="checkbox"/> Brass valves <input type="checkbox"/> Brass T <input type="checkbox"/> Copper w/ lead solder <input type="checkbox"/> Copper w/ 95/5 solder <input type="checkbox"/> Stainless <input type="checkbox"/> Nylon/PEX
PHOTO NUMBER(S)			
BRAND/MODEL NUMBER IF KNOWN		OTHER INFO <input type="checkbox"/> Underneath inaccessible <input type="checkbox"/> Leaking/dripping <input type="checkbox"/> Fixture wear/discoloration <input type="checkbox"/> Cold runs hot <input type="checkbox"/> Not working-do not label	NOTES

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Water Outlet Inventory Spreadsheet

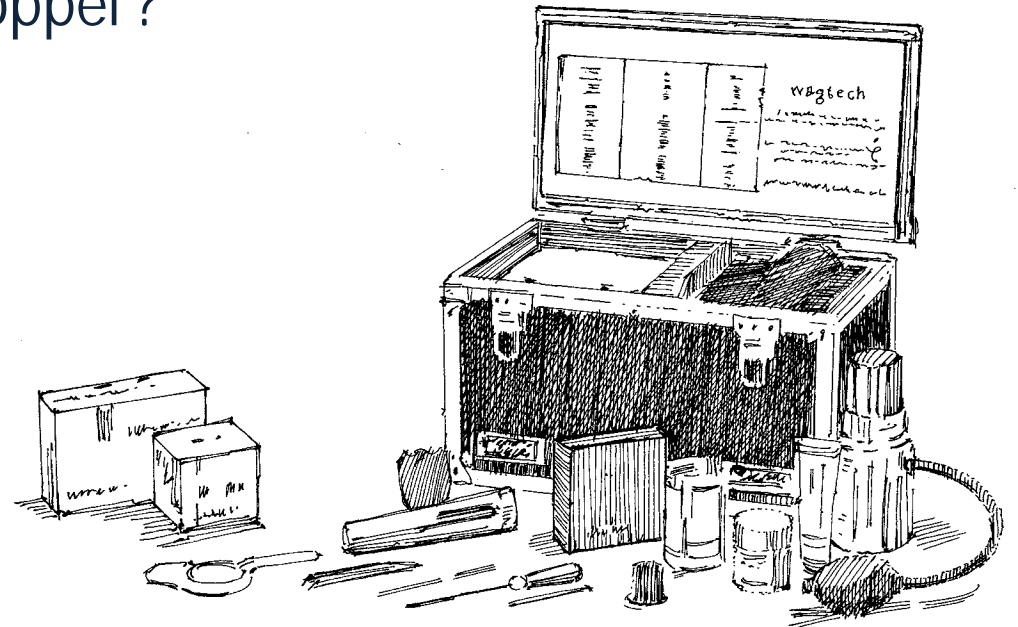
#1	Type	Location	Sample ID#	OP ² Y/N	CORR ³ Y/N	Filter Y/N	Brass ⁴ Y/N	Aerator/ Screen	MA ⁵ Y/N	Chiller Y/N	Water Cooler		Comments
											Make	Model	
1	WC	Room 25	MS-WC-25	Y	N	N	Y	N	N	N	Elkay	1234	
2													
3													

- ¹ – Number the outlets beginning with the outlet closest to the point of entry
- ² – Fixture operational? Document if permanently or temporarily out of service
- ³ – Signs of corrosion? Such as but not limited to frequent leaks, rust-color water, stained fixtures, etc.
- ⁴ – Brass fittings, faucets or valves?
- ⁵ – Motion activated?

Development of a Water Sampling Plan

Establishes a sampling protocol at drinking water outlets

- Do you need to sample at all?
- Do you need to sample for bacteria, lead or copper?
- Who should create the sampling plan?
- Who should collect the samples?
- Where should you sample?
- What laboratory will you use?
- When are you going to sample?
- What will you do when you receive results?



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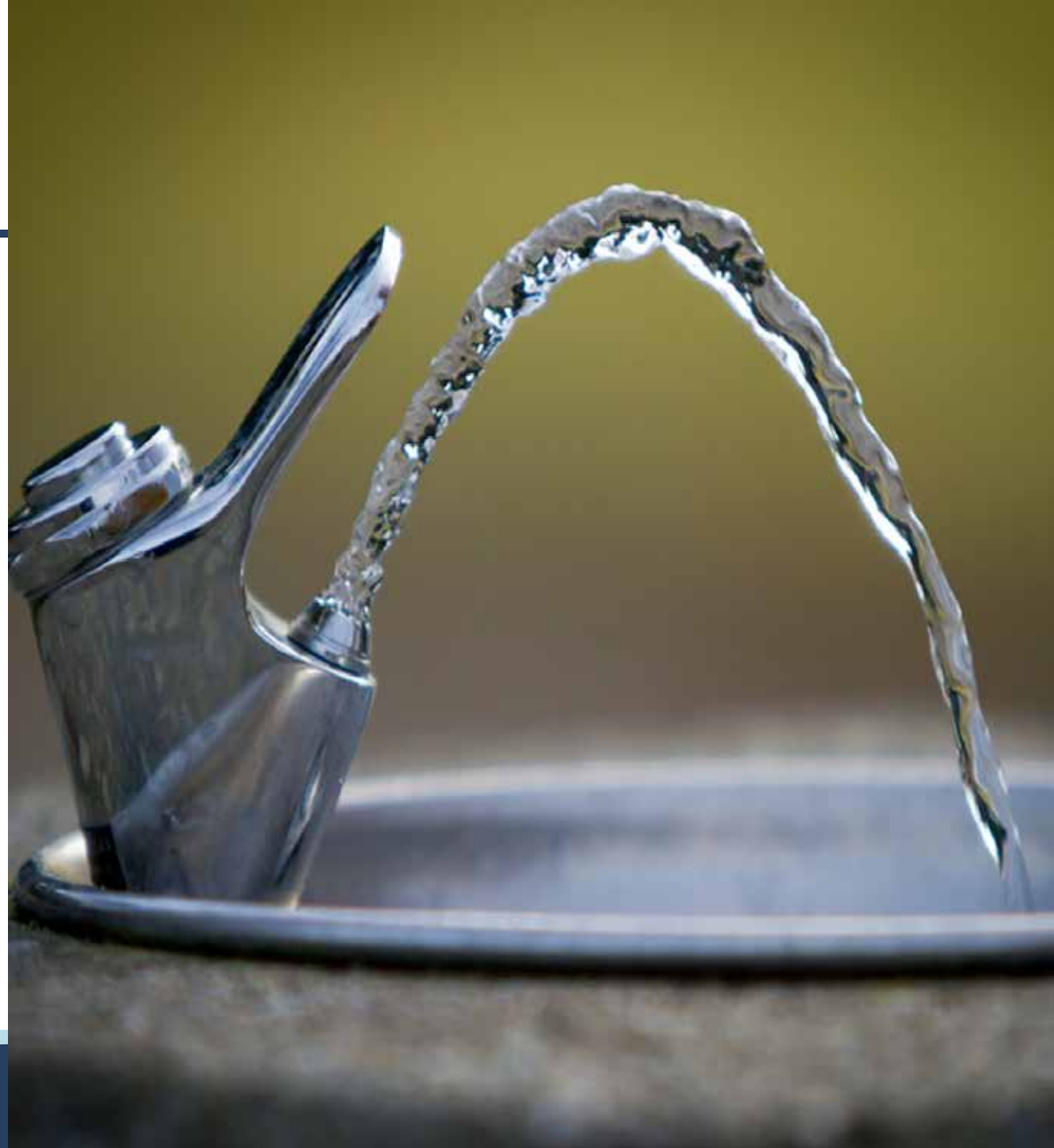
Designate a School Employee

- Sampling program coordination
- Follow-up activities

What Drinking Water Fixtures Will be Tested?

High priority

- Drinking fountains (bubblers & water coolers)
- Kitchen food prep sinks
- Classroom combo sink/fountain
- Home economic room sinks
- Teacher's lounge, nurses sink
- Any sink or ice machine known to be used for consumption



Create a Fixture Identification Code

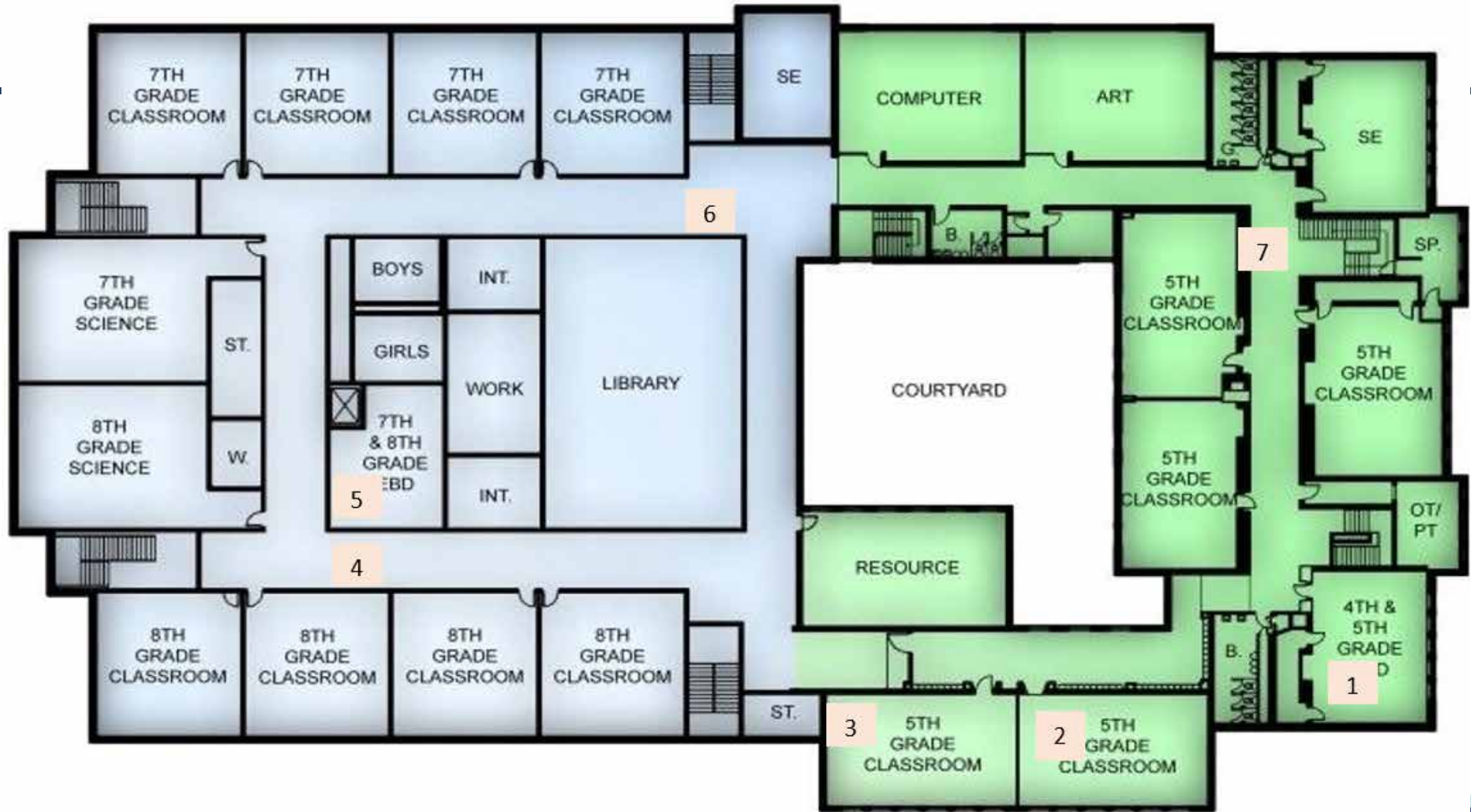
SEQUENCE #	FIXTURE ID	SAMPLE LOCATION	FIXTURE TYPE
1	110-B	Room 110	Bubbler
2	111-B	Room 111	Bubbler
3	114-WC	Room 114	Water Cooler
4	120-CF	Room 120	Classroom Faucet
5	Café-KS	Cafeteria	Kitchen Food Prep Sink
6	Gym-WC-SE	Gymnasium	Water Cooler
7	KS-PrepLf	Kitchen	Food Preparation Left Faucet
8	102-NS	Nurse's Room 102	Nurse's Sink

Another Coding Example:

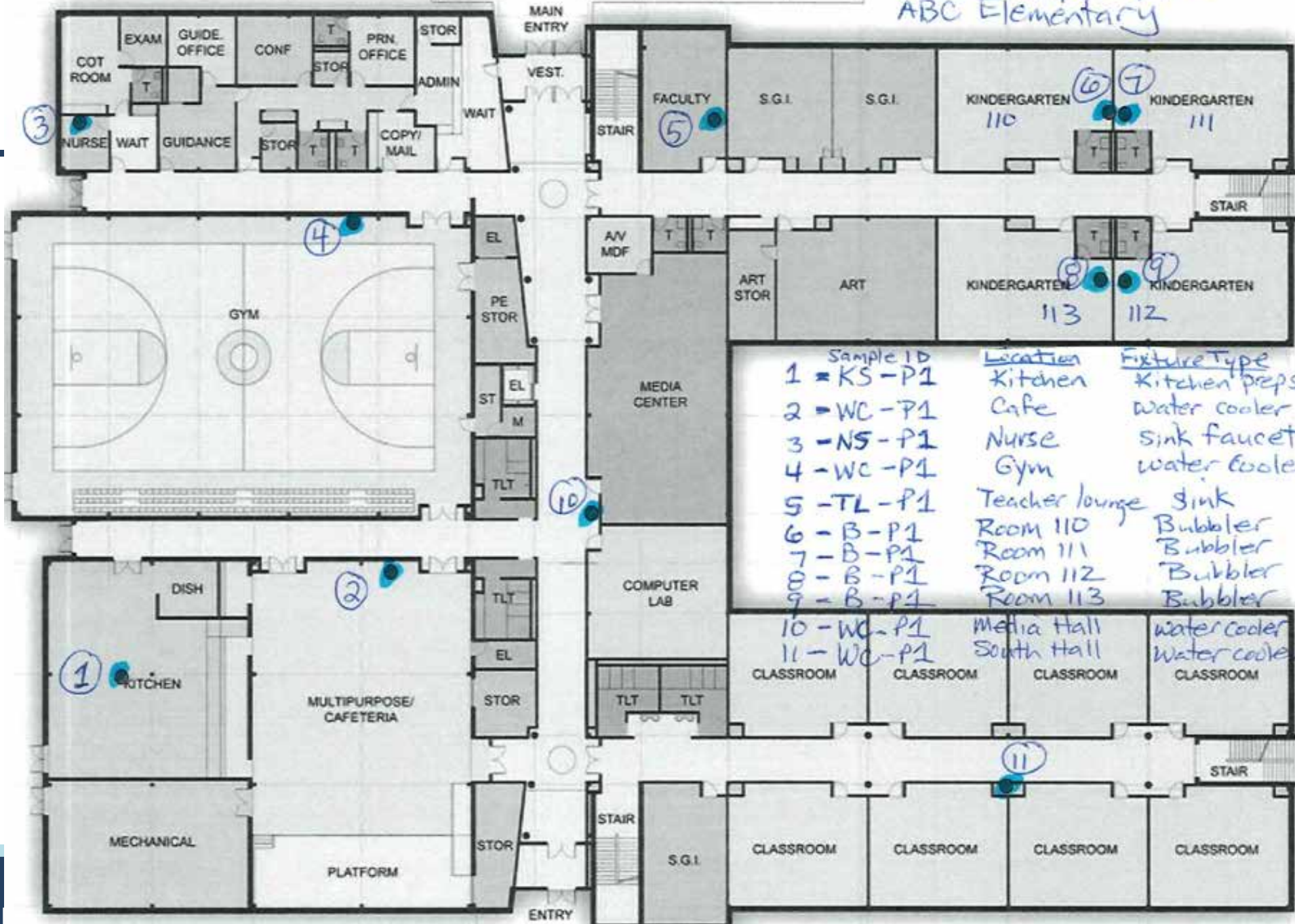
WHS-DF-1FL-RM25 (Building Code-Fixture Type-Location)

White High School – Drinking Fountain – 1st Floor – Room 25

ABC Middle School 2018 Drinking Water Fixture Floor Plan



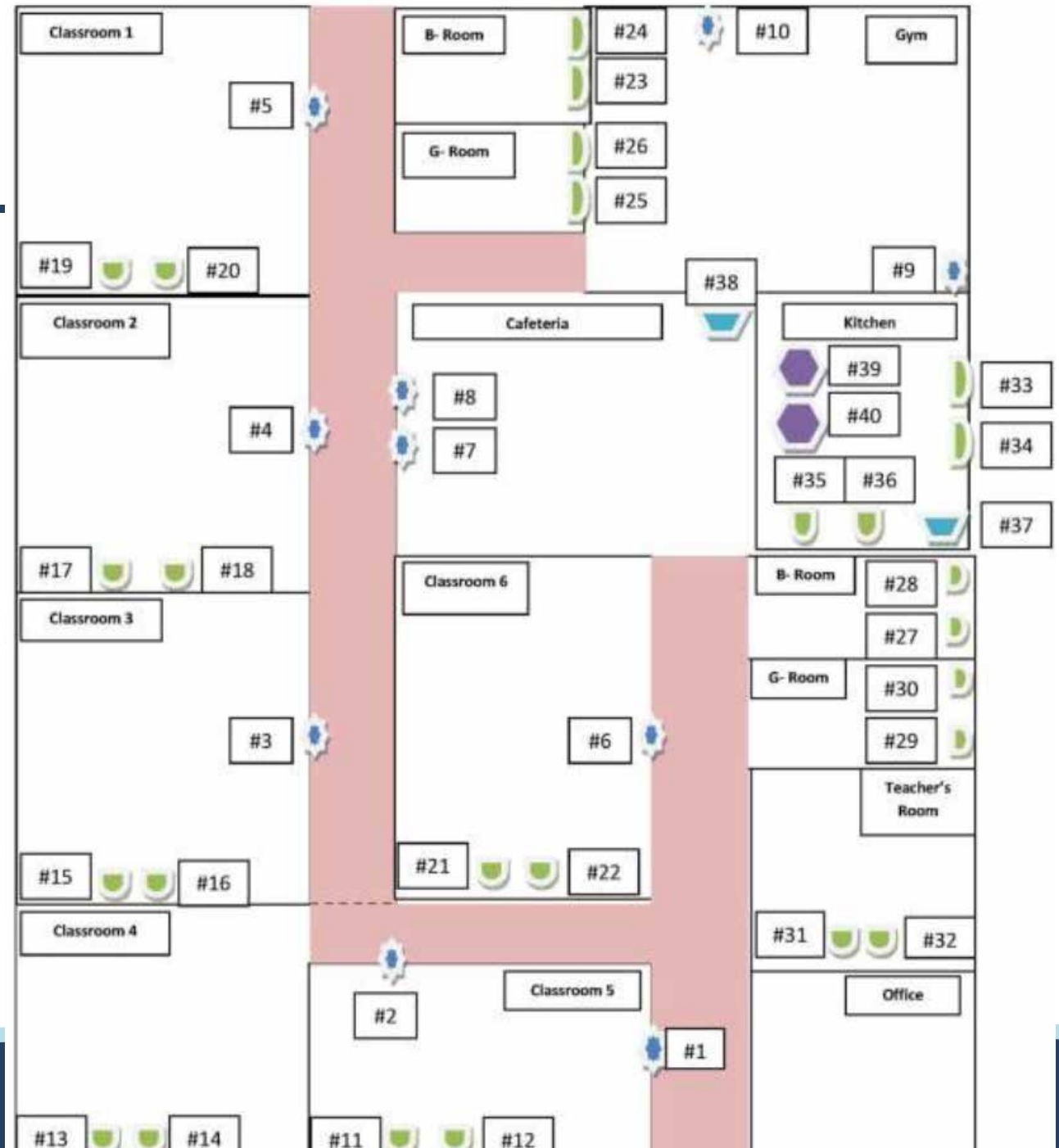
Lead Sample plan
ABC Elementary



ABC High School



Fixture ID#	Fixture Type	Location
HS-1-B	Bubbler	Across from Office
HS-2-B	Bubbler	C-Room 5
HS-9-B-SE	Bubbler	Gym Southeast
HS-33-KS-NE	Kitchen Sink	Kitchen Northeast



Sampling Plan Check List

- q Prioritize buildings & fixtures
- q Designate sample team & lab
- q List materials needed
- q Document sample collection protocol
- q Select sample date & time
- q Choose a certified laboratory
- q Sample delivery to the lab
- q Interpreting results
- q Have an action plan ready
- q Communication methods



Guidance and Toolbox

DEQ resources: www.michigan.gov/drinkingwater

- Click on *School Drinking Water Training Program*
- Guidance documents
- Templates
- Webinars
- Other resource information
- Contact your community water supplier or local health department

Summary

- Conduct a survey to evaluate, identify and trace your building plumbing
- Create a plumbing profile based on your findings
- Utilize the profile for corrective actions and to develop a drinking water sampling plan



When You Need Help or Resources...

...Please call me!

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