

City of Fresno Community Meeting

Discolored Water Investigation Findings

(210-day Report)

August 17, 2016

Today's Meeting Agenda

1. Mayor Swearingin welcomes, introduces panel
2. Kassy Chauhan, State Water Resources Control Board
3. Dr. Vernon Snoeyink, Water Quality Expert
4. Thomas Esqueda, Director of Public Utilities
5. Corine Li, U.S. Environmental Protection Agency, Region IX
6. Dave Pomeville, Fresno County Health Department
7. Questions

Kassy Chauhan

Senior Sanitary Engineer – Merced District
State Water Resources Control Board

City of Fresno

Discolored Water Investigation

Kassy D. Chauhan, P.E.
State Water Resources Control Board
Division of Drinking Water

August 17, 2016

Discussion Topics

1. State Water Resources Control Board –
Division of Drinking Water – Regulatory
Authority
2. DDW Review of City Files/Reports
3. Wellhead Corrosion Control Treatment
4. Customer Complaints
5. Monitoring and Reporting Requirements
6. Lead and Copper Rule Compliance
7. Findings/Conclusions
8. Next Steps
9. Questions

Regulatory Authority

- USEPA – Delegates Authority for regulation of public water systems in California to the State Water Resources Control Board – Division of Drinking Water.
- SWRCB – DDW – Merced District Office
 - Provides Regulatory Oversight of the City of Fresno's public water system.
 - Ensure compliance with the applicable drinking water standards.
 - Issues water supply permits for all new sources and/or treatment.

Chronology of Events

- February 2016:
 - ❖ City notified DDW of discolored water complaints and the Lead Action Level Exceedances (ALEs) at homes in NE Fresno.
 - ❖ Meeting with the City to discuss results, further monitoring and provide the Lead Public Education information.
- March 2016 through August 2016:
 - ❖ Internal review of City files, reports and oversight of all proposed improvements/modifications to the PWS.

DDW Internal Review

- Correspondence File Review
- Review of Monthly Treatment Reports
- Review of Historical Lead and Copper Rule Reports
- Review of Electronic Files
- Review of the Electronic Annual Report (EAR)
- Coordination With Other DDW managers/supervisors
- Coordination with USEPA
- Discussions with Corrosion Control Experts employed by DDW.

Wellhead Corrosion Control Treatment

- City installed corrosion control treatment at PS 129, 133, 140, 168, 197, 308 and 321 during annual plant shutdown from 2006 to 2011.
 - ❖ Violates permit and regulation that requires a revised permit and approval prior to installation of any new treatment.
 - ❖ Confirmed by previous Assistant Public Utilities Director, Lon Martin and Chief of Operations, Ken Heard – never on a year around basis.
 - ❖ Continuous treatment with polyphosphates in March 2016 at Wells 140, 143, 151, 168, 176, 177, 186, 318, 319 and 321
 - ❖ Approval from DDW in March 2016.

Customer Complaints

- Three Locations
 - Monthly SWTP – Complaints Related To The NE SWTP
 - Electronic Annual Report – All Complaints Received By City.
 - Complaints Received Directly by DDW

City of Fresno [1010007]

Year	# of color complaints (EAR)	# of color complaints (RPTs)
2007	0	--
2008	0	--
2009	4	--
2010	0	--
2011	4	5
2012	16	1
2013	16	0
2014	17	0
2015	7	0
2016	Not Available	0

Customer Complaints

- Complaints Received Directly by DDW
 - Isolated Reports of Discolored Water
 - Triaged to the City
 - No additional action taken
- EAR Review
 - No significant number of customer complaints reported regarding color and/or turbidity.
 - Significant number of OTHER complaints reports in 2010 to 2012 as a result of City's meter installation project.
- SWTP Review
 - Very few customer complaints reported.

Monitoring and Reporting Requirements

- Submit monthly reports for the NE SWTP and wellhead treatment locations.
- Report all customer complaints related to water quality.
- Operate the SWTP and wellhead treatment sites in accordance with an approved operations plan.
- Submit permit amendment application and receive approval prior to the installation of any new wellhead treatment or significant changes at existing treatment facilities.

Lead and Copper Rule Compliance Review

- City has completed 10 rounds of lead and copper tap monitoring since April 1993.
- Out of 734 individual samples collected, there have been 8 individual sample tap results with lead greater than the Action Level (AL)
- Sample sites selected in accordance with the Lead and Copper Rule and approved by EPA prior to sampling.
- City has been in compliance with the Lead and Copper Rule since April 1993.
- Lead and Copper tap monitoring in NE Fresno since January 2016 is considered special investigative monitoring.
- Compliance with Lead and Copper Rule based on 90th percentile.
- Action Level Exceedance requires action by utility.

DDW Findings Continued

- The City has completed the required Lead and Copper Rule (LCR) monitoring and has been in compliance with the LCR.
- City has submitted the required monthly SWTP reports for the NE SWTP.
- DDW has been overseeing and will continue to oversee the investigation into the discolored water and Lead ALEs in NE Fresno in coordination with USEPA.

DDW Findings Continued

- The City failed to properly track and report customer complaints both on the Monthly SWTP Reports and the EAR.
- The City installed corrosion control treatment at a select number of wellheads in northeast Fresno during the annual shutdown of the SWTP.
- The City operated in violation of the Water Supply Permit by installing wellhead corrosion control treatment during the annual plant shutdown without receiving approval.
- The City did not add a corrosion inhibitor during all days that the SWTP was operational in 2011 but achieved corrosion control through pH and alkalinity adjustments.

Next Steps:

- * Continue to review NESWTP and wellhead treatment plant reports.
- * Review results of special investigative monitoring.
- * Provide oversight of the City's efforts to address the lead ALEs at kitchen sinks and discolored water.
- * Coordinate with DDW Executive Staff and USEPA.
- * Implement procedures to ensure DDW staff are properly reviewing customer complaint logs and records during sanitary surveys.
- * Assist residents with inquiries regarding sampling results or discolored water at their homes.

Questions

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Dr. Vernon Snoeyink

Professor of Environmental Engineering Emeritus
University of Illinois at Urbana-Champaign

Summary Analysis of Discolored Water Occurrence in Fresno's Tap Water

Vernon Snoeyink, Ph.D.

Professor Emeritus

University of Illinois at Urbana-Champaign

Urbana, Illinois

City of Fresno

August 17, 2016

Outline

1. Overall Approach
2. Water Chemistry Challenge
3. Pipes and fixtures
4. Recommendations to City

Overall Approach

- ❑ We looked at a large volume of data and analyzed them from various perspectives
- ❑ In evaluating corrosion data in home plumbing, there are three general areas that we consider:
 1. Water Chemistry
 2. Pipe/Fixture type and quality
 3. Water use pattern
- ❑ We are going to talk about these three

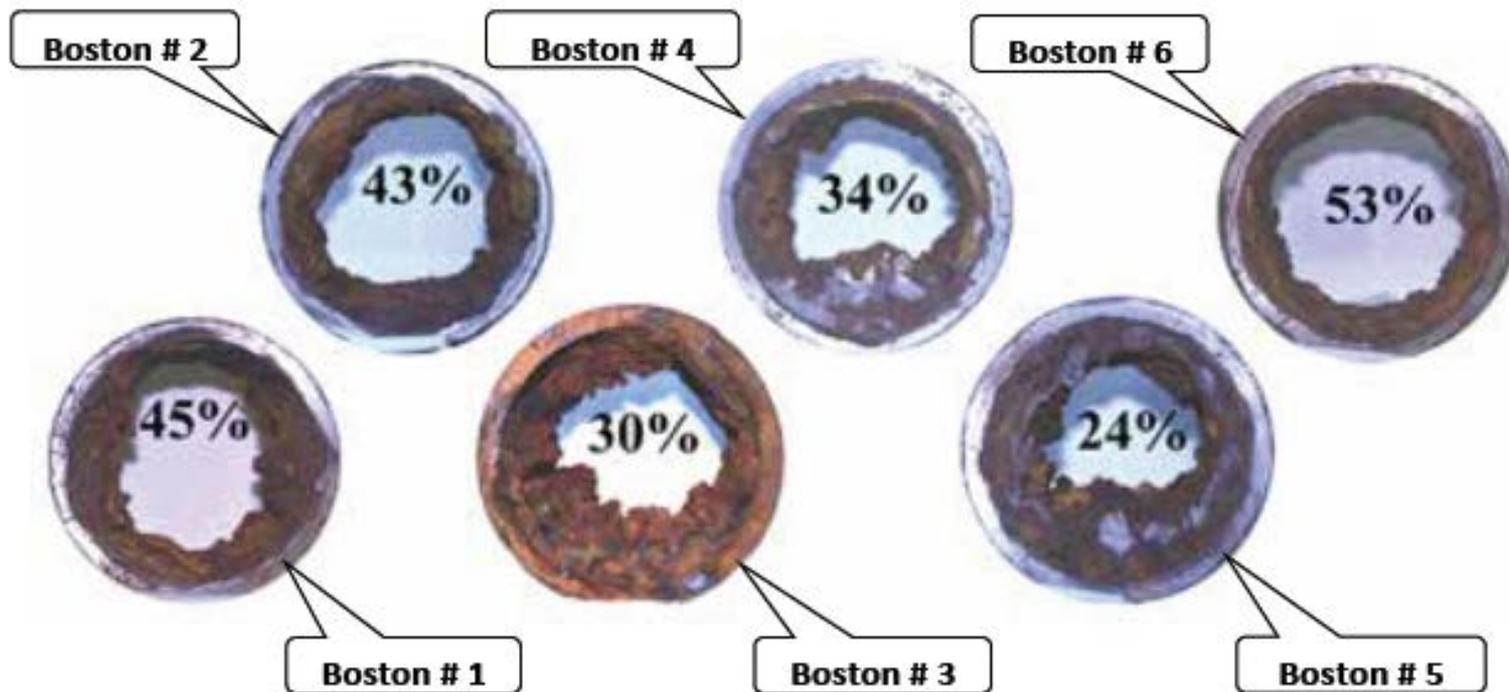
Water Chemistry

- ❑ There are three water chemistry factors that we look at in these situations:
 1. Water pH
 2. Water Alkalinity
 3. The concentration of the corrosion inhibitor
- ❑ The key is to maintain these three chemical parameters stable

Summary

- ❑ The water chemistry of the surface water is greatly different from that of the groundwater
- ❑ The chemistry of each by itself is not the problem
- ❑ The problem is that the water in the system was frequently changing from one source to the other
- ❑ That means the chemistry of the water was frequently changing in the homes
- ❑ That variability contributed to the discolored water problem

Case Study – Boston Iron Pipes



Pipe/Fixture Type

About Galvanized Pipes

- ❑ Galvanized pipe is a poor choice for residential plumbing, especially hot water pipes
- ❑ Galvanized pipes are iron pipes coated with a zinc layer
- ❑ The zinc layer is typically eliminated over time in all waters (1 to 60 years)
- ❑ Discolored water is caused by iron leaching from the exposed iron
- ❑ Experience shows that stabilizing the water chemistry should greatly reduce the discolored water problem

Interior Corrosion of Galvanized Pipe in and out of a Water Heater

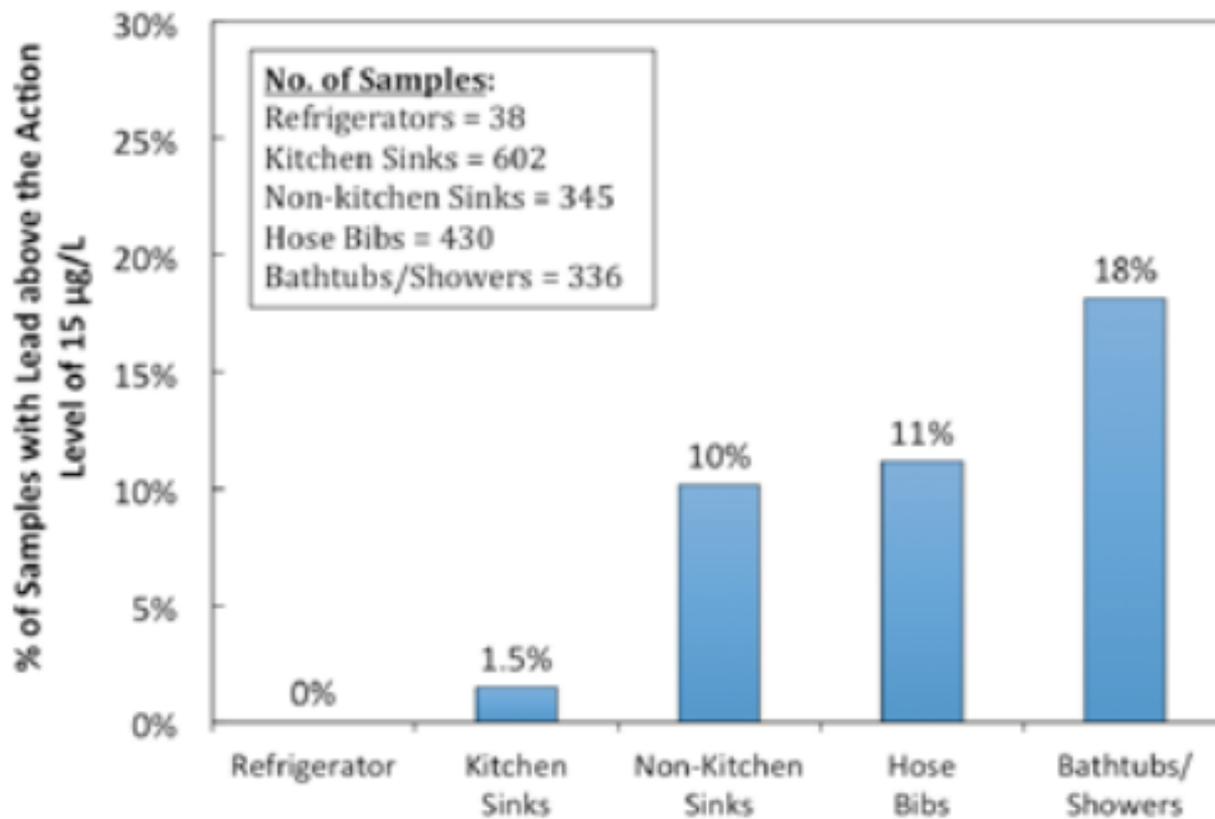


Cold Water Side



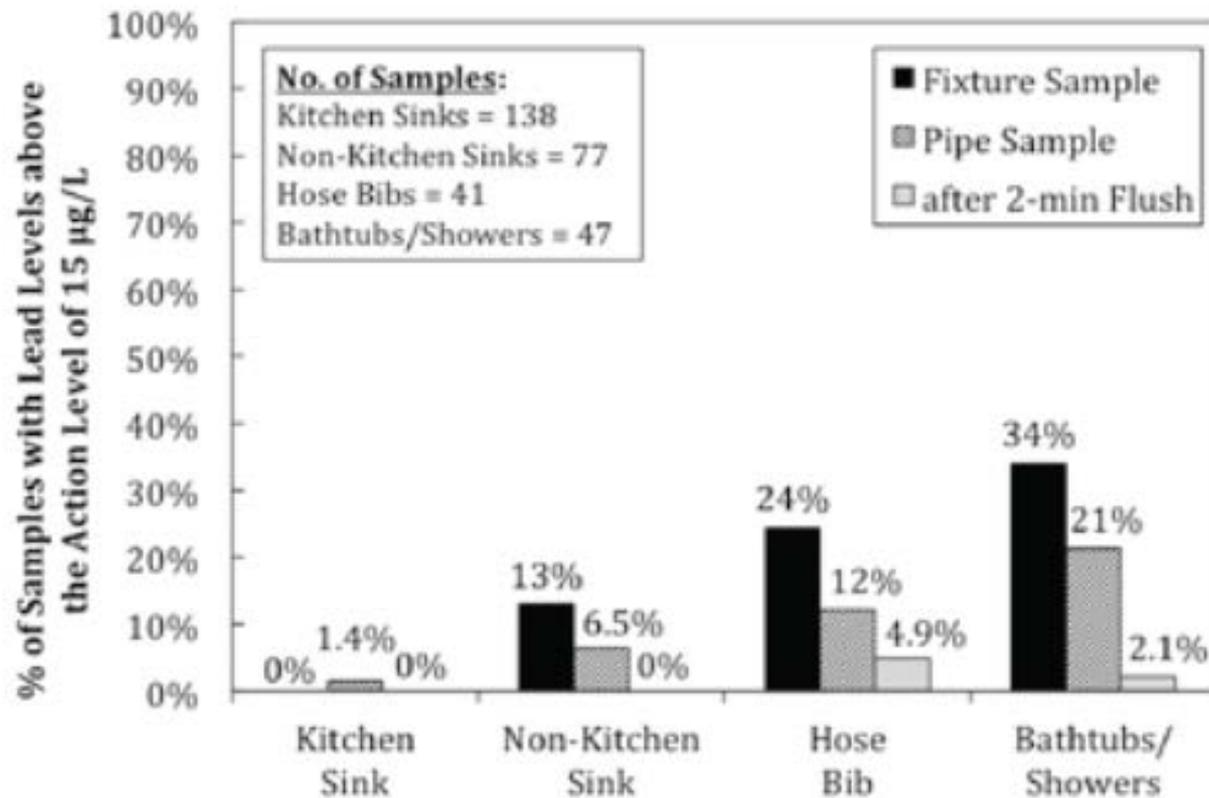
Hot Water Side

Effect of Faucet Location on Lead Levels (City of Fresno)



Decreasing frequency of use

Effect of Flushing Time on Lead Levels (City of Fresno)



Recommendations

1. Stabilize water quality by bringing the chemistry of the surface water to the chemistry of the groundwater (pH, alkalinity, phosphate)
2. Continued focused monitoring to track improvements
3. Move towards a galvanized pipe-free future
4. Encourage homeowners to replace brass drinking fixtures with low-lead ones
5. Continue studies to optimize treatment

Thomas Esqueda

Director of Public Utilites

City of Fresno

Status of Residential Water Quality Sampling Program (8/8/2016)

1. ~22,500 Homes in Study Area (Zip Codes 93710, 93720, 93730)
2. 1,531 homes currently requesting water quality samples
3. 526 unique homes sampled (1,136 fixture samples)
4. Data returned for 376 homes
5. 119 homes have been sampled at least twice
6. 52 homes currently have test results showing the presence of Lead at an indoor plumbing fixture above the Action Level of 15 parts-per-billion.

Fixtures with Pb > 15 ug/L	
Bath Tubs	44
Bath Sinks	24
Utility Sinks	6
Kitchen Sinks	4
Garage Sink	1
Shower	1

Corine Li

Director of Drinking Water Division

U.S. Environmental Protection Agency, Region IX

Dave Pomeville

Director

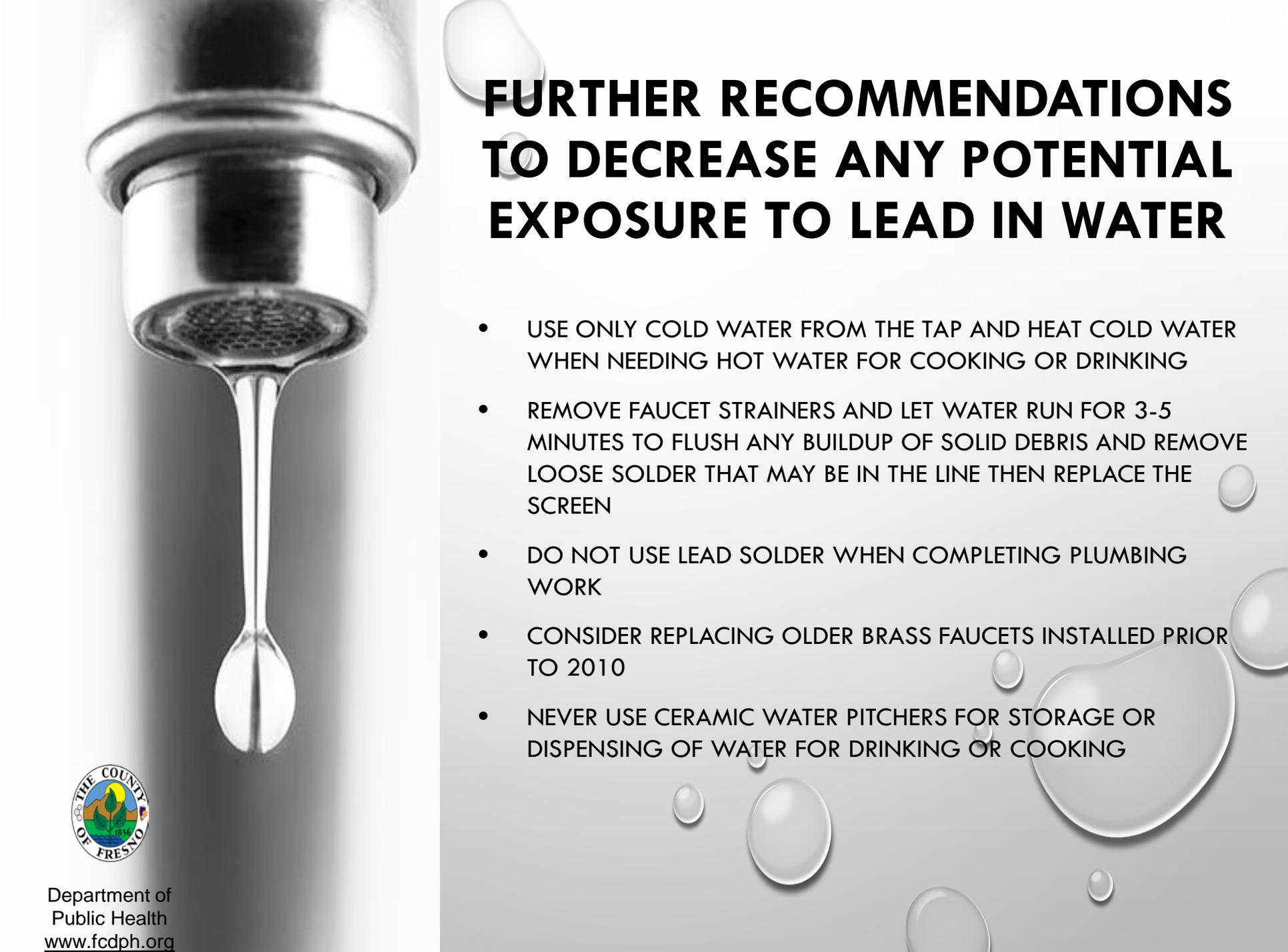
Fresno County Department of Health



RECOMMENDATIONS WHILE THE CORROSION PROBLEM IS BEING ADDRESSED

- WATER SHOULD BE FLUSHED FOR TWO MINUTES, OR UNTIL CLEAR (WHICHEVER IS LONGER) FOR DRINKING AND COOKING
- IF THERE ARE PREGNANT WOMEN OR CHILDREN UNDER 6 YEARS OLD IN YOUR HOUSEHOLD, YOU SHOULD ALSO CONSIDER USING BOTTLED WATER OR AN EPA REGISTERED WATER FILTER ([HTTP://BIT.LY/1IQBE3C](http://bit.ly/1IQBE3C)) FOR DRINKING AND COOKING





FURTHER RECOMMENDATIONS TO DECREASE ANY POTENTIAL EXPOSURE TO LEAD IN WATER

- USE ONLY COLD WATER FROM THE TAP AND HEAT COLD WATER WHEN NEEDING HOT WATER FOR COOKING OR DRINKING
- REMOVE FAUCET STRAINERS AND LET WATER RUN FOR 3-5 MINUTES TO FLUSH ANY BUILDUP OF SOLID DEBRIS AND REMOVE LOOSE SOLDER THAT MAY BE IN THE LINE THEN REPLACE THE SCREEN
- DO NOT USE LEAD SOLDER WHEN COMPLETING PLUMBING WORK
- CONSIDER REPLACING OLDER BRASS FAUCETS INSTALLED PRIOR TO 2010
- NEVER USE CERAMIC WATER PITCHERS FOR STORAGE OR DISPENSING OF WATER FOR DRINKING OR COOKING



Questions/Comments

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