



Overview of 2015 NDWAC Recommendations to the USEPA for Revisions to the Lead and Copper Rule Proposed Changes for Copper

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March 29, 2016

advancing the science of water

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- This presentation is for informational purposes only
- The information contained in this presentation reflect the views of the presenter and not those of American Water or any of its affiliates

Current Requirements

- Monitor at same sites as for lead
 - Higher copper is typically connected to new construction
- MCLG = 1.3 mg/L
- Action Level = 1.3 mg/L
- Secondary MCL = 1.0 mg/L
 - Metallic taste, blue-green staining

<http://www.epa.gov/your-drinking-water/table-regulated-drinking-water-contaminants>
<https://www.epa.gov/dwstandardsregulations/secondary-drinking-water-standards-guidance-nuisance-chemicals>

Health Effects

- Short term exposure: Gastrointestinal distress
- Long term exposure: Liver or kidney damage
- People with Wilson's Disease should consult their personal doctor if the amount of copper in their water exceeds the action level

What is Wilson disease?

- The body needs a small amount of copper from food to stay healthy; however, too much copper is poisonous
- Wilson's disease is a genetic disease that prevents the body from removing extra copper
- In Wilson disease, the liver does not filter copper correctly and copper builds up in the liver, brain, eyes, and other organs
- Over time, high copper levels can cause life-threatening organ damage

Kayser-Fleischer Rings

- Kayser-Fleischer rings result from a buildup of copper in the eyes and are the most unique sign of Wilson disease
- During an eye exam, a health care provider will see a rusty-brown ring around the edge of the iris and in the rim of the cornea
- People with Wilson disease who show signs of nervous system damage usually have Kayser-Fleischer rings



Kayser-Fleischer Ring

Source:

<http://cnx.org/content/m15007/latest/>.

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Author: Herbert L. Fred, MD; and Hendrik A. van Dijk. (No changes made).

Major Conclusions of the NDWAC LCR Work Group

- Establish separate requirements for copper
- Actions should be based on aggressiveness of water to copper using a “bin” approach, not routine in-home monitoring
- Water systems would:
 - Demonstrate their water is not aggressive to copper
 - OR
 - Initiate and maintain a public education program

Major Conclusions of the NDWAC LCR Work Group (cont.)

- EPA to determine whether / under what circumstances treatment should be required
- “The LCRWG recommends this approach, assuming EPA determines that the health benefits of regulating copper justify the costs. A full health risk assessment for copper was beyond the scope of the LCRWG’s charge, however; and, thus, EPA’s analysis of whether benefits justify the costs may have implications for these recommendations.”

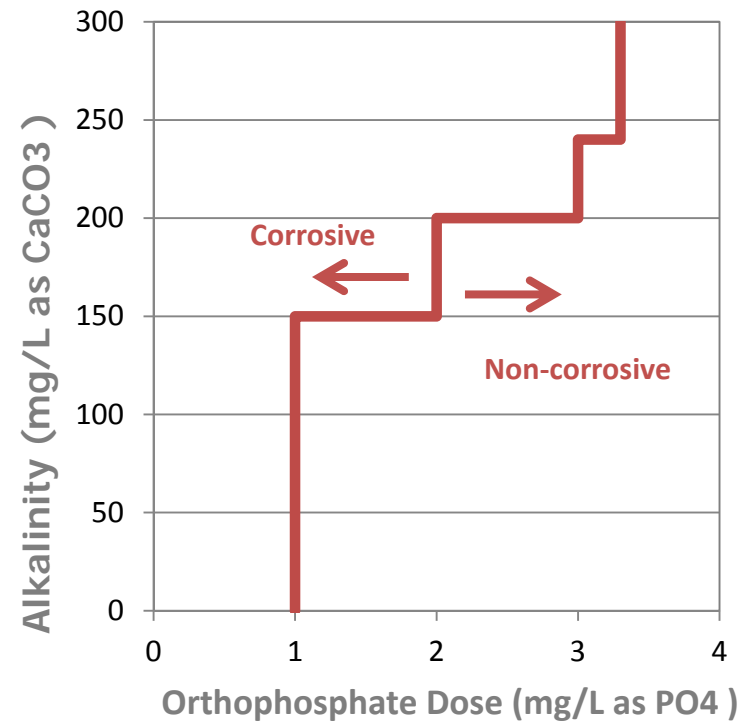
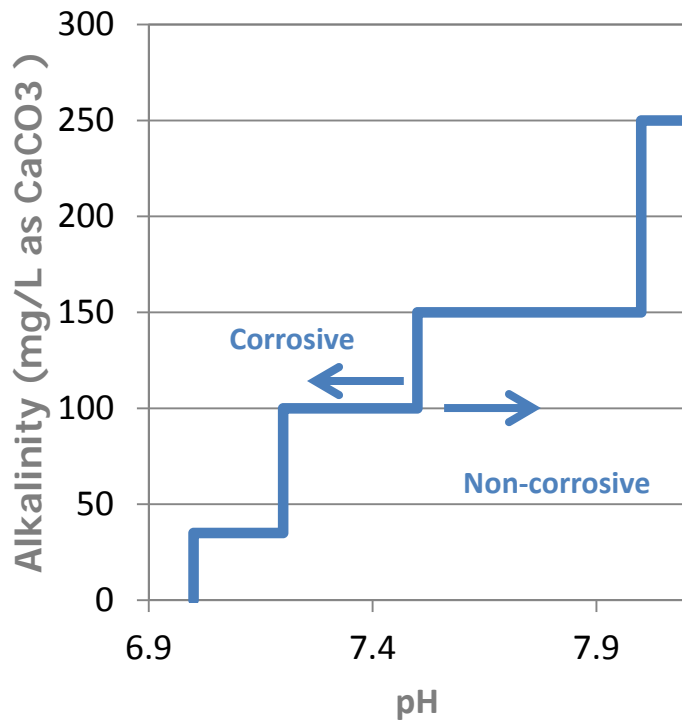
Bin Approach to “Water is Aggressive to Copper” - pH

- Examples of bins (for verification by EPA) would be:
 - a. if alkalinity is < 35 pH must be > 7.0
 - b. if alkalinity is 36 to 100, pH must be > 7.2
 - c. if alkalinity is 101 to 150 , pH must be > 7.5
 - d. if alkalinity is 151-250 , pH must be > 8

Bin Approach to “Water is Aggressive to Copper” - Orthophosphate

- If orthophosphate is used, examples of bins would be:
 - a. if alkalinity < 150, PO₄ must be >1 mg/L
 - b. if alkalinity is 150 to 200, PO₄ must be > 2 mg/L
 - c. if alkalinity is 200 to 240, PO₄ must be > 3 mg/L
 - d. if alkalinity is > 240, PO₄ must be > 3.3 mg/L

Another View of the Bins



Courtesy of David Cornwell, EE&T

Initial Demonstration on Aggressiveness to Copper

- Conduct water quality parameter monitoring to assess whether their water meets the definition established by EPA
- Conduct a pipe loop study to demonstrate the water chemistry is non-aggressive

Initial Demonstration on Aggressiveness to Copper

- Conduct a one-time evaluation with copper sampling at vulnerable houses (houses < 2 years old with new copper plumbing) to demonstrate that water chemistry is non-aggressive (copper levels fall under the AL/SMCL)
- Change water chemistry to within the range established for non-aggressive water quality

Continued Demonstration on Aggressiveness to Copper

- Maintain those WQPs that demonstrate it maintains non-aggressive water

OR

- Conduct copper sampling at vulnerable houses (houses < 2 years old with new copper plumbing) to demonstrate that water chemistry is non-aggressive (copper levels fall under the AL/SMCL)

Public Education Program for Systems with Aggressive Water

- Information to all new homes (new construction or change of service) upon initiation of new service

AND

- Information to newly renovated homes at time of renovation

OR

- Information to all customers on a routine basis

Other Recommendations

- EPA should consider whether or under what circumstances CCT should be required for a PWS classified as aggressive to copper
- Systems should continue to be required to notify the primacy agency if they are making any long-term treatment change or addition of a new source
- Additional information needs to be gathered on the current distribution of pH, alkalinity, and phosphate residual among systems nationally to fully understand the implications of this approach.



THANK YOU!

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