# Corrosion Control

TWO RIVERS UTILITIES

Water Department

# Chemical overview

- Chlorine
  - Used for disinfection
- Hydrofluosilicic Acid (Fluoride)
  - Used to strengthen teeth in children
- Sodium Hydroxide (Caustic)
  - Used for pH control for lead & copper leaching

# Disinfection Byproducts (DBP)

- Natural Organic Matter (NOM)
  - Found in natural occurring surface water
- When chlorine and NOM mix, the unintended consequence results in Disinfection Byproducts.
- Total Trihalomethanes (TTHM) & Haloacetic Acid (HAA5)
  - MCL TTHM 80 ppm
  - MCL HAA5 60 ppm

# History of corrosion control

- 2010 – WDNR mandate required a pH adjustment to 8.6 su.
- 2017 – Lead action exceedance level
  - DNR required CCT Study
- March 2020 – First study was reported to WDNR
- Sept. 2021 – WDNR Mandate ( to be completed by Sept. 2023)
  - 2.0 ppm orthophosphate addition and maintain pH control
  - All 2000 lead service laterals be replaced
- CCT Study continued with concerns over plumbing corrosion and DBP formation.

# CCT Study results
## Addition of orthophosphate

- 2010 pH adjustment data shows increase in DBP formation
  - pH adjustment counter reacts chlorine disinfection
- Increased corrosion potential for copper plumbing
- Increased DBP formation
  - Potential to exceed WDNR MCL
- Increase in biofilm

# WQI Recommendations

- Immediate Action
  - Request 2-year extension from WDNR
  - Eliminate pH adjustment over 6-months
  - Dose orthophosphate at 0.20 ppm
  - Perform profile sampling at 4 locations
- Mid to Long-term Action
  - Eliminate pre-chlorine feed
  - Continue Unidirectional Flushing (UDF)
  - Continue CCT Study

# Conclusion

- WDNR NR 809.04(59) defines optimal corrosion control treatment not to cause public water system to violate national drinking water regulations
- Data clearly indicates orthophosphate feed could cause a violation of DBP rule