



Distribution Water Quality PARTICIPANT HANDOUT

Overview:

This lesson presents the water quality changes that may occur as the water moves through the infrastructure in the distribution system. Different water quality parameters and challenges are discussed along with solutions.

Learning Objectives:

At the completion of this lesson, participants should have the ability to:

- Be able to describe what different water quality parameters tell us about distribution system health
- Be able to describe and apply key practices for managing water age and quality during storage

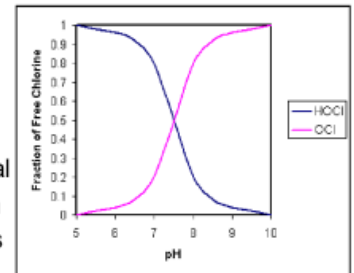
Key Concepts:

Impacts of pH

- pH Too High:
 - May precipitate excessive calcium carbonate in distribution system
 - Restrict water flow in pipe
- pH Too Low:
 - May corrode water pipes
 - Red water issue (iron particulates)
 - Pipe failure and rupture
 - Lead and copper issues

Impacts of pH

- pH impacts the form of Chlorine
- Chlorine is most effective between pH 5.5 – 7.5
- pH impacts TOC removal
 - Lower pH = better removal
- pH affects DBP formation
 - Higher pH = more TTHMs



Notes:

Managing Water Age and Quality

- Manage Hydraulics in Storage Facilities
 - Inlet/outlet configuration, baffling
 - Increase turnover rate
 - Pumping schedules (deep cycling)
 - Mixing
- Manage chemistry
 - Increase chlorine residual
 - Shock chlorination
 - Aeration (radon, TTHM , hydrogen sulfide, etc)

Notes:

Taste and Odor

- Chlorine taste and smell
 - Chlorinated organic from sourcewater
 - Di-and trichloramine
 - Excess residual concentration
- Earthy-musty odor
 - Natural Algae products (MIB and Geosmin)
 - Algae under chlorine exposure
- Swampy or rotten egg odor
 - Hydrogen sulfide
- Others (e.g. gasoline, metallic)
 - From contaminations of various sources

Additional Resources:

- RCAP's Resource Library: www.rcap.org
- EPA Distribution Resources for Small Systems
 - <http://www.epa.gov/dwcapacity/distribution-resources-small-drinking-water-systems-0>