# COMMON HEALTH QUESTIONS RELATED TO MONOCHLORAMINE

## 27) Does monochloramine use change water chemistry? Does monochloramine use contribute to the release of lead or other contaminants into drinking water?

***Water chemistry[1] can be changed by many factors, including the use of monochloramine.***

- Water chemistry can be changed by many factors including temperature, rainfall, the presence of natural organic matter[2], and monochloramine use.
- Changes in water chemistry from monochloramine use may impact lead or other contaminant levels. [3]
- Changes in water chemistry from monochloramine use can also impact biofilm activity as well as nitrite and nitrate formation. [4]

***Water utilities typically monitor for problems caused by changes in water chemistry from monochloramine use.***

- Water utilities should monitor for changes in water chemistry at water treatment facilities.
- Utilities should monitor for lead and other regulated contaminants from metal corrosion that may be caused by monochloramine use.[3]
- Water utilities using monochloramine should monitor and control for biofilm activity as well as nitrite and nitrate formation.[4]

***Water utilities may need to adjust their treatment processes for problems caused by changes in water chemistry from monochloramine use.***

- Water utilities may need to adjust their treatment processes to reduce levels of lead or other regulated contaminants to meet EPA regulations.
- Water utilities may need to adjust their treatment processes to reduce biofilm activity, including nitrite and nitrate formation.[4]
- EPA provides guidance for water utilities on problems that can arise from changes in water chemistry from monochloramine use.[5]

*Additional Supporting Information:*

1. Water chemistry describes the chemical properties of water such as pH, hardness, and alkalinity. Changes in water chemistry can cause subsequent changes to the physical (e.g., taste and odor) and biological (e.g., biofilm formation and nitrification) properties of water.

2. *Natural Organic Matter*: Complex organic compounds that are formed from decomposing plant, animal and microbial material in soil and water. They can react with disinfectants to form disinfection by products. Total organic carbon (TOC) is often measured as an indicator of natural organic matter.

3. Changes in water chemistry can make water more corrosive, which may lead to pipe corrosion (in the distribution system and home plumbing) and an increase in the release of lead or other contaminants into the water. However, utilities can test water for corrosiveness and make changes to the water treatment process to address this problem. See monitoring guidance at http://www.epa.gov/OGWDW/lcrmr/pdfs/guidance_lcmr_pws_monitoring.pdf. (Also see question 18 and footnote 5 below).

4. The addition of ammonia that is added to the water to make monochloramine, or which naturally occurs in some waters, impacts water chemistry. Ammonia can be converted by naturally occurring bacteria through a process called nitrification to form nitrites and nitrates. EPA regulates these contaminants at the treatment plant. For more information about nitrification see: http://www.epa.gov/safewater/disinfection/tcr/pdfs/whitepaper_tcr_nitrification.pdf
For more information about biofilms see question 2 or: http://www.epa.gov/safewater/disinfection/tcr/pdfs/whitepaper_tcr_biofilms.pdf. Nitrate/nitrite, biofilm and lead/ corrosion control are discussed in EPA's simultaneous compliance manual at: http://www.epa.gov/OGWDW/disinfection/stage2/pdfs/guide_st2_pws_simultaneous-compliance.pdf. High

levels of nitrates/nitrites can be especially harmful to infants; additional health effect information can be found at: http://www.epa.gov/ogwdw/contaminants/dw_contamfs/nitrates.html.
5. EPA guidance to utilities on addressing corrosion issues is available at:
http://www.epa.gov/safewater/lcrmr/pdfs/guidance_lcmr_control_strategeis_revised.pdf .