6) How effective is monochloramine vs. chlorine as a secondary disinfectant? 

Both chlorine and monochloramine are effective secondary disinfectants. 

- Both chlorine and monochloramine protect the quality of treated water as water travels through pipes.
- Both chlorine and monochloramine produce disinfection byproducts, some of which are harmful to human health.
- EPA and CDC believe the benefits of drinking water disinfection outweigh the potential risks from disinfection byproducts.

Monochloramine has several advantages over chlorine as a secondary disinfectant.

- Monochloramine is more chemically stable than chlorine.
- Monochloramine produces fewer potentially harmful regulated disinfection byproducts than chlorine.
- Monochloramine is longer lasting than chlorine, making it useful for killing certain harmful organisms found in pipes such as those that cause Legionnaires' disease.

The choice of which secondary disinfectant to use varies from water utility to water utility based on their needs.

- States and water utilities work together in selecting primary and secondary disinfectants.
- States and water utilities balance a wide range of factors in deciding which disinfectant to use.
- Either chlorine or monochloramine is used as a secondary disinfectant by water utilities.

Additional Supporting Information:
1. See question 3 for a discussion of primary and secondary disinfectants. See questions 17 and 18 for advantages and disadvantages of monochloramine use.
2. See question 2 for more information about protecting the quality of water as it travels through pipes.
3. EPA has adopted enforceable regulations to limit occurrence of disinfection byproducts in drinking water for a group of four total trihalomethanes (TTHMs): (chloroform, bromodichloromethane (BDCM), dibromochloromethane (DBCM), and bromoform);, a group of five haloacetic acids (HAA5): (monochloroacetic acid (MCA), dichloroacetic acid (DCA), trichloroacetic acid (TCA), monobromoacetic acid (MBA), and dibromoacetic acid (DBA));, and the individual disinfection byproducts chlorite and bromate. The maximum contaminant levels for these disinfection byproducts are: TTHMs (0.080 mg/L), HAA5 (0.060 mg/L), chlorite (1.0 mg/L), bromate (0.010 mg/L). See Stage 2 Disinfection Byproducts Rule (71 FR 388, January 4, 2006) for more information on disinfection byproducts and discussion of uncertainties, at http://www.epa.gov/fedrgstr/EPA-WATER/2006/January/Day-04/w03.pdf.
4. For more information on Legionnaire’s disease visit http://www.cdc.gov/legionella/.
5. Factors include the type and condition of source water, how much water needs to be treated, complexity of operation, etc. Guidance manuals are available at: http://www.epa.gov/safewater/disinfection/stage2/compliance.html. Hard copies are available by ordering publications through EPA’s Water Resource Center (phone: 202-566-1729).