COMMON HEALTH QUESTIONS RELATED TO MONOCHLORAMINE

23) Does monochloramine cause cancer?

EPA believes that water disinfected with monochloramine that meets regulatory standards poses no known or anticipated adverse health effects, including cancer.

- Most of the research on the cancer risk of monochloramine comes from animal studies using mice and rats.[1]
- EPA believes that available data support the use of monochloramine to protect public health.
- EPA's regulatory standard for chloramines provides a wide margin of safety[2] to offset any uncertainties in risk assessments.

Monochloramine use may reduce bladder cancer risk compared to chlorine use.

- Several studies have shown lower rates of bladder cancer in communities served by systems that use monochloramine as a secondary disinfectant compared to systems that use chlorine.[1]
- Compared to chlorine, water treated with monochloramine may contain higher concentrations of *unregulated* disinfection byproducts but the cancer risk is unknown.[3]
- EPA continues to support research[3] on the safety of monochloramine use.

Monochloramine use produces lower levels of regulated disinfection byproducts that are linked to cancer.

- *Regulated* disinfection byproducts are produced in lower amounts when monochloramine is used.
- *Regulated* disinfection byproducts serve as indicators[4] of other types of byproducts that may also be reduced as a result of using monochloramine.
- Compared to chlorine, water treated with monochloramine may contain higher concentrations of *unregulated* disinfection byproducts.[3]

Additional Supporting Information:

1. More information on these studies can be found at EPA IRIS (Integrated Risk Information System) http://www.epa.gov/ncea/iris/subst/0644.htm, in the Stage 2 DBPR (71 FR 388, January 4, 2006), or the Criteria Document for Chloramines, (http://www.epa.gov/ncea/pdfs/water/chloramine/dwchloramine.pdf).
2. For additional information regarding how uncertainty factors (also known as safety factors) are applied to risk assessments to provide a wide margin of safety see: http://epa.gov/risk/dose-response.htm
3. EPA is currently researching *unregulated* disinfectant byproducts that can form from monochloramine use. Compared to chlorine, water treated with monochloramine may contain different *unregulated* disinfection byproducts than chlorinated water. There are few studies on health effects of unregulated disinfection byproducts. However, additional information on NDMA, an unregulated byproduct, can be found at: http://www.epa.gov/tio/download/contaminantfocus/epa542f07006.pdf . Also see question 9 and 19.
4. TTHMs and HAAs (see question 6 for more information) typically occur at higher levels than other known and unknown disinfectant byproducts. The presence of TTHMs and HAA5 is representative of the occurrence of many other chlorinated disinfectant byproducts; thus, a reduction in TTHMs and HAA5 generally indicates a reduction of other types of disinfectant byproducts.