Information Regarding an Upcoming Activated Carbon Bond Vote – November 6, 2012

The City of Rutland is required by EPA to bring our water system into compliance with federal disinfection byproduct (DBP) regulations. Disinfection byproducts are chemical compounds which form when a disinfectant, like chlorine or monochloramine, reacts with naturally occurring organic matter present in water, even filtered water. According to EPA, the specific disinfection byproducts in our water, which are above the federal limit, very slightly increase the risk of bladder cancer and various reproductive problems. Therefore we have an obligation, both moral and legal, to improve our water.

With technical assistance and a grant from the Vermont Department of Environmental Conservation, we investigated a number of options to reduce DBPs. To be selected for implementation, the method must have a proven track record that it safely and effectively reduces DBPs. The study concluded that there are two viable options which satisfy those criteria: 1) we can switch our disinfectant from chlorine to monochloramine or 2) we can construct an activated carbon filter. The activated carbon filter would remove some (not all) of the naturally occurring organic matter. We would still need to disinfect the water with chlorine after the carbon filter. Either option would be expected to reduce DBPs and bring our system into compliance with the federal regulations.

As Commissioner of Public Works and a licensed professional engineer, I have no issues with either method from a safety or water quality perspective. I do have concerns about implementing a much more costly technology when a proven option is available with significantly lower capital and operational expenses. There are other deficiencies and mandates related to our aging water, wastewater, and transportation systems which will require millions of dollars of investment over the next several years to correct. There has been an ongoing public debate over which water disinfection method would be proper for Rutland. Since it is the City residents that use the water and bear the financial burden for the water system's expenditures, I believe that, given that either option is safe and effective, those residents should be allowed to make the decision.

That decision will be made on **November 6, 2012** when the voters will be presented with a bond vote for $5.5 million for an activated carbon filter. If the bond vote passes, we will design and construct that filter. Considering the loan repayment and the greater operational expenses, a yes vote will increase each water account's bill by approximately $125 per year. If the bond does not pass, we will design and construct a system to switch from chlorine to monochloramine, which is a safe and effective option that is used by about 100 million Americans. Switching to monochloramine will increase each water account's bill by approximately $7 per year.

Please see the attached responses to questions and concerns that we have received during the past several months regarding the use of monochloramine.

Evan Pilachowski, P.E.
Commissioner of Public Works

Frequently Asked Questions – Monochloramine Use

Q. Has the federal government determined that it is safe to use monochloramine in drinking water, and if so, is there data supporting this?

A. Monochloramine has been used in drinking water in the United States for about 95 years. Currently about 100 million Americans drink water disinfected by monochloramine. Also, the City of Rutland asked EPA this same question on June 29, 2012. EPA replied on July 24, 2012 to say that they "believe monochloramine is safe and appropriate to use. Research and experience indicate that monochloramine use at regulated levels is a safe means for disinfecting drinking water.... [They] believe that on balance the option to use monochloramine represents a feasible and prudent public health protection measure."

Also the Centers for Disease Control & Prevention (CDC) investigated numerous health concerns in South Burlington a few years ago. After extensive interviews and studying all available information, they could not find a link between the reported health complaints and monochloramine in drinking water.

Q. According to the State of Vermont, is it safe to use monochloramine in drinking water, and if so, is there data supporting this?

Health impacts of chlorine and monochloramine have been studied. There is more data on the use of chlorine, but available data on the health impacts of using monochloramine indicates that it is safe and effective. After studying the available data, a report was issued by the VT Department of Health dated July 25, 2012 which concluded that they believe that "the use of monochloramine will reduce the concentration of regulated and possibly unregulated DBPs in drinking water. This reduction may contribute to fewer adverse health effects compared to drinking water treated with free chlorine as a secondary disinfectant."

In addition, the Vermont Legislature discussed and heard testimony regarding the safety of monochloramine use over multiple years. After listening to and carefully considering countless hours of testimony from various water treatment experts and water users on both sides of the issue, the legislature acted to allow for the continued use of monochloramine as a disinfectant because they determined on a whole that monochloramine is a safe and necessary alternative to meet federal disinfection byproducts regulations.

Q. Will monochloramine increase operational expenses at the sewer treatment plant?

A. Monochloramine, while stable in drinking water, will dissipate quickly in the sewer system. No operational changes would be necessary at the sewer treatment plant.

Q. Will monochloramine cause leaching of lead and copper into our water, and will it contribute to the corrosion of gaskets and household appliances?

A. No, Rutland City has been using zinc orthophosphate to control corrosion in the water system since the 1980s. This corrosion control method has been proven to prevent leaching of lead and copper and the corrosion of gaskets and household appliances.

Q. Will monochloramine use lead to the formation of dichloramine and trichloramine in the water system?

A. Dichloramine and trichloramine are undesirable chemicals for any water system given their taste and odor impacts, as well as their ability to act as an irritant. Surface water systems that use chlorine as a disinfectant will form dichloramine and trichloramine because of the naturally occurring ammonia in the surface water source. Rutland's water comes from a surface water source, and as a result **dichloramine and trichloramine are already present in our water system**. By switching from chlorine to monochloramine, we would be able to decrease the formation of dichloramine and trichloramine.

Q. Will monochloramine harm the taste and odor of drinking water?

Q. By using monochloramine, will we have a less effective disinfectant and treatment system?

A. Monochloramine is a more stable disinfectant than chlorine, and therefore a less reactive chemical. The City would continue to use chlorine as the primary disinfectant at the water treatment plant. Monochloramine would be used as a secondary disinfectant to assure continued protection throughout the water distribution system.

Q. Does ammonia and chloramine contribute to biological growth in the distribution system?

A. In properly operated water systems similar to Rutland City, the use of monochloramine has not contributed to biological growth or caused similar problems.

Q. If there are water leaks, would the monochloramine be more hazardous to fish?

A. Both monochloramine and chlorine negatively impact aquatic life. However, the flows in our brooks and creeks are much larger than a typical water leak. As with chlorine, monochloramine would be neutralized through contact with soil and organic matter and would be diluted quickly in the full flow of our brooks and creeks, reducing the hazard to aquatic life.

Q. What do I do if I want to remove monochloramine from my water?

A. As with chlorine, there may be a very small portion of the population that has sensitivities to monochloramine. There are several options to remove monochloramine depending on what the water will be used for. Aquarium owners should consult with a pet store to remove both monochloramine and ammonia. Other users may remove monochloramine by placing a slice of orange or lemon in a glass of water, placing a vitamin C tablet in bath water, or using an activated carbon filter specifically designed to remove monochloramine.

As with chlorine, whole house water filters are available for anyone who wants to minimize their exposure to disinfectants. Conservative estimates show that whole house units could cost about $400 per year per household. Anecdotal evidence from some users indicates that if water use is not excessive, the filters may have much longer life spans. Some users have reported costs below $100 per year for such a system. While water filters may not remove 100% of chloramines, they have been shown to remove chloramines to below the detection limit. **This would effectively reduce chloramine concentrations below the concentrations currently seen in our water system.**

Q. Are the disinfection byproducts that form with the use of monochloramine more dangerous than the disinfection byproducts that form with the use of chlorine?

A. There are hundreds of disinfection byproducts that form with the use of either chlorine or monochloramine. Some of them form more readily with the use of chlorine, and some form more readily with the use of monochloramine. The disinfection byproducts that have the highest concentrations are the ones that are currently regulated by EPA. It is likely that a few of the hundreds of the disinfection byproducts that form in much smaller concentrations are more toxic than the regulated compounds. Whether or which of these are more readily formed by chlorine or chloramines is unknown, but nearly all of the compounds will form in extremely small concentrations as compared to those disinfection byproducts that are currently regulated.

There are a number of compounds that are of specific concern when using monochloramine, but these require specific conditions and precursors to form. We tested for the potential formation of these compounds and the presence of necessary precursors and found that they are not a concern for our water system. Two of the compounds, Hydrazine and NDMA, have detection limits of a few parts per **trillion**, and