

Champlain Water District
Clarifications and Corrections to People Concerned
About Chloramines (PCAC) literature

- 1) CWD was the first water system in the nation to achieve the “Excellence in Water Treatment Award” under the Partnership for Safe Water in 1999. CWD’s water treatment process is reviewed each year and CWD has maintained this excellence status for the filtration facility annually since 1999. To date, there are four (4) other water treatment facilities that have received this honor in the United States. CWD’s tap water is safe and of high quality.
- 2) CWD uses monochloramine as a secondary disinfectant and free chlorine as it’s primary disinfectant. Both disinfectants have undergone extensive analysis by USEPA under the Safe Drinking Water Act.
- 3) CWD uses food grade, NSF certified ammonium sulfate at very dilute levels to change the free chlorine to monochloramine for secondary disinfection throughout the system. Due to CWD’s excellent water source, this small amount of ammonium sulfate stays dissolved in the water (just as calcium, magnesium and other natural substances are) and the water is safe for drinking, bathing, and showering.
- 4) CWD requested and received intensive on-site review of the CWD treatment process by the Vermont Agency of Natural Resources, Department of Environmental Conservation, Water Supply Division. This review showed a well-run process with high degree of due diligence ‘well thought out, thoroughly controlled and meticulously documented.’ In 2005, CWD applied and received a required permit from this Agency to use monochloramine for secondary disinfection.
- 5) CWD, Vermont Water Supply Division, and Vermont Department of Health personnel have reviewed health questions as described by PCAC literature. **To date, investigations of reports have not indicated any connection to water supply.** Literature regarding these symptoms has been inaccurately taken from effects of pure product chemicals and organo-formed substances in swimming pools formed by reactions between free chlorine and urine, sweat, etc. CWD’s secondary disinfection uses high quality monochloramine formed from food-grade; NSF certified ammonium sulfate in CWD’s high quality water.
- 6) Monochloramine in tap water as opposed to free chlorine in tap water substantially reduces risks of long-term or short-term effects of the free chlorine and the disinfection by products generated by the free chlorine.
- 7) The public has been kept fully aware of the engineering assessments that resulted in the switch beginning in 2004. CWD held a legally warned public bond vote on this investment in 2004 with an 81.6% approval rating of the voting public at (13) official polling locations in Chittenden County.
- 8) USEPA did a risk assessment of free chlorine and monochloramine under the Safe Drinking Water Act - disinfection by product regulations for health effects and set a maximum residual disinfectant level for both disinfectants at 4 ppm. Below 4 ppm, USEPA has determined that no adverse health effects occur with an

- adequate margin of safety. CWD water has an average of 2 ppm of monochloramine (one-half of the USEPA approved level)
- 9) CWD's monochloramine is a combination of very dilute amounts of sodium hypochlorite (diluted to 1 to 75,000) and food grade; NSF certified ammonium sulfate (diluted 1 to 800,000). We do not use anhydrous (gas) ammonia or aqua ammonia (i.e. the types of ammonia you may use at home in your cleaning solutions). Material Safety Data Sheets (MSDS) do not apply for these dilutions used in drinking water. MSDS sheets apply to pure product occupational exposure.
 - 10) Monochloramine is an effective secondary disinfectant that kills E. coli and other pathogens according to USEPA and is more effective at disinfecting the surfaces of pipe and eliminating the risk of legionnaire's disease according to recent research. The statements made by PCAC regarding its effectiveness are not accurate.
 - 11) USEPA has assessed monochloramine, free chlorine and other disinfectants for carcinogenic (cancer) and non-cancer health risk under the Safe Drinking Water Act. Experts have published several studies for monochloramine and free chlorine that examine skin and respiratory effects. The most pertinent skin study showed that monochloramine **did not** cause skin hyperplasia. Regarding respiratory effects, indoor air quality specialists study these types of effects to understand their relationship to different substances. They have used their studies to assess and set safe levels of many substances. CWD's water uses dissolved ammonium ion to control the negative aspects of free chlorine. Low levels of dissolved ammonium in shower water have not been linked to respiratory effects. The miniscule levels of undissolved ammonia present during showering are very close to natural background levels in the air.
 - 12) Kidney dialysis patients must have numerous substances removed from water including disinfectants like free chlorine and monochloramine. This is because dialysis directly contacts the bloodstream. Kidney dialysis patients can safely drink, cook and bathe in disinfected water. Like all disinfectants such as free chlorine, monochloramine is only harmful if it directly enters the bloodstream. Since water only comes into contact with the bloodstream during hemodialysis, very strict water purification standards are already followed by the kidney dialysis industry. These standards are set forth by the Association for the Advancement of Medical Instrumentation and specifically address both monochloramine and free chlorine. CWD contacted and worked with the Fletcher Allen Kidney Dialysis center for one year prior to the switch.
 - 13) Environmental Agency determinations (from USEPA and others) relating to chloramines discharge to aquatic habitats predominately deal with the impacts of wastewater treatment plants. Small flows of potable tap water (car washing, lawn watering, etc.) containing disinfectants such as free chlorine or monochloramine will infiltrate harmlessly into the ground or, if they reach surface water, will not kill aquatic life. CWD has developed and implemented a dechlorination procedure, as required by Vermont State Law for free chlorine and monochloramine, for large quantities of disinfected water such as water main breaks and hydrant flushing. Vitamin C is used in these procedures.

- 14) Champlain Water District has always had a strong history of a proactive approach to drinking water treatment to provide optimal public health protection. Monochloramine disinfection has become the nation's standard for secondary disinfection to reduce the negative aspects of free chlorine disinfection such as disinfection by products. Monochloramine has been used as a disinfectant in many parts of the U.S. since 1917. Presently, an estimated 68 million consumers at the nation's most progressive drinking water suppliers are served water disinfected with monochloramine.
- 15) CWD consumers receive high quality, potable water for all uses. CWD continues to not recommend any further treatment of the high quality, potable water supplied to its customers. This is because improperly designed; used, or maintained home treatment devices may degrade CWD's high quality delivered water. CWD recognizes that decisions regarding home treatment technology are technically complex. Customers may also contact NSF International at www.nsf.org for information they may use to help in their decisions on purchasing these consumer products. These certified units may be more expensive than uncertified, off-the-shelf products. In addition, many inexpensive carbon filter products either are not certified by any standard or are only certified for taste & odor reduction. It is a misapplication of these products to rely upon them to reliably remove disinfectants such free chlorine or monochloramine.
- a. NSF international certifies products for chloramines (monochloramine) reduction, chlorine (free chlorine) reduction, and taste & odor reduction. NSF International considers these reductions aesthetic effects, not health effects.
 - b. There is a wide range of products meeting the reduction requirements for all three (3) types of reduction. Products certified under low flow conditions, i.e. less than 2.5 gallons per minute (gpm), are generally used for reducing levels in water used for drinking/tap water purposes. Products certified under high flow conditions, i.e. 2.5 gpm or higher, are generally used for reducing levels in water used for applications that require high water use (such as bathing, etc). **By the nature of their application, units certified to reduce levels under low flow conditions are generally significantly less expensive than units designed to reduce levels under high flow conditions. THE COST OF THE UNIT RELATES TO THE FLOW TREATED, NOT WHETHER IT IS REDUCING CHLORINE, MONOCHLORAMINE, OR TASTE & ODOR.**
 - c. NSF international certifies against a standard that a product:
 - i. During that product's service life reduces 50 % of chlorine from a max of 2 ppm (i.e. reduces 2 ppm of chlorine down to 1 ppm),
 - ii. During that product's service life reduces more than 50 % of chloramines from a maximum of 3 ppm to down 0.5 ppm,
 - iii. During that product's service life reduces taste & odor from a maximum of 2 ppm chlorine, 50 % (i.e. 1 ppm) during its service life.

- iv. In general, all products certified for chloramines reduction are also certified for chlorine and taste & odor reduction.
- d. This means that a carbon filter certified for chloramines and chlorine reduction is certified to be more effective at removing chloramines than chlorine throughout its service life.

In summary, filters certified by NSF to reduce monochloramine are certified to reduce monochloramine down to a lower level under CWD's current monochloramine secondary treatment, than filters certified by NSF to reduce chlorine are certified to reduce chlorine levels down to under CWD's previous free chlorine secondary treatment. These certification results only apply to units that are properly installed and maintained.

In general, NSF certified filters may achieve higher reductions of monochloramine and chlorine at flow rates lower than those tested, or, at the beginning of the filter's service life, etc. NSF international also certifies shower filters to reduce chlorine to the same level of reduction indicated above to reduce aesthetic effects within the shower such as odor. This certification is an aesthetic effect and not a health effect. Some of the less expensive shower filters use zinc and copper to turn the free chlorine into soluble zinc or cuprous chloride, which then is in the shower water.

The zinc shower filters actually chemically change the chlorine, and therefore, are generally smaller and less expensive than the carbon filters as listed above. Similar to Vitamin C cartridges, these smaller zinc devices can treat larger quantities of water less expensively than the carbon filters are able to treat. Carbon filters, zinc, or Vitamin C cartridges (discussed below) require change out after their useful life is exhausted. Some Vitamin C filters may provide visual indicators when change-out is necessary.

NSF does not certify shower treatment devices for monochloramine reduction because the standard committee did not determine this was necessary. This is likely for the same reason that the aesthetic taste & odor reductions are applied to chlorine and not to monochloramine. Monochloramine does not cause aesthetic odor problems in showers.

- 16). The San Francisco Public Utilities Commission (SFWATER.org) recently confirmed that Vitamin C shower cartridges effectively remove a monochloramine residual. Vitamin C shower fixtures contain a cartridge that is recommended for regular replacement. These Vitamin C shower cartridges are less expensive than Carbon filters. Therefore, based upon personal preference, monochloramine may be removed from shower water using Vitamin C shower cartridges. Information on Vitamin C filters is available at www.vitaCshower.com, www.vitashowercorp.com www.vitaminshower.net.
- 17) Champlain Water District is charged under the Safe Drinking Water Act with supplying safe drinking water all the way to the consumer's tap and takes this

responsibility very seriously. CWD's water is treated to high standards so that all CWD customers can safely use it for all potable purposes.

- 18) If you notice a medical symptom, follow the advice of your health care provider. Beware of advice from non-medical groups. Although monochloramine has been used safely for over 90 years, in recent years, a San Francisco-based group, Citizens Concerned about Chloramines (CCAC), has charged that water disinfected with monochloramine may cause many common types of medical conditions. Remember that your health care provider is the only professional that can accurately diagnose and treat medical conditions. Don't make the error of listening to unqualified medical advice.
- 19) The Food & Drug Administration regulates bottled water under the Safe Drinking Water Act because it is considered a food. It must meet the same standards as CWD water. Spring water is not a scientific term as employed in bottled water labeling but a marketing term and does not assure any specific type of quality.

CWD and the Vermont Health Department are committed to appropriate follow-up for health questions that consumers may attribute to the public water supply. In order for these follow-ups to be effective, please have your physician contact the VT Department of Health, Division of Health Surveillance at 1-800-640-4374, if they ever suspect that a condition is related to the public water supply. Dial 2-1-1 for human and health services information and referral. As stated earlier, your health care provider is your most important resource for following up on your health concerns.