

Chemical Accident Reconstruction Services, Inc.

July 8, 2002

Mr. Gayle Smith, Chairperson
Drinking Water Additives Joint Committee
C/O Jane Wilson
NSF International
789 N. Dixboro Road
Ann Arbor, Michigan 48105

Re: NSF-61 and PEX Piping

Dear Mr. Smith:

Thank you for your letter of June 6, 2002 in response to my letter of January 17, 2002.

By way of sending a copy of this letter to Clif McLellan I am requesting that he keep me advised of the on-going Risk Assessment for t-butanol (that you mentioned) and the eventual outcome of that assessment. I would expect that the State of California has a considerable file on this very subject that they would be pleased to share with NSF. Keep in mind that the California Standard for t-butanol is much lower than NSF's. I expect they have a scientific basis for their Standard.

I am attaching a plot of some recent testing that was performed per the NSF-61 protocol for extracted t-butanol. The results are plotted for the NSF-61's prescribed 16 hours plus 24 hours, and 72 hours. It's my opinion that extraction times should be adjusted to 72 hours as the accuracy and reliability in measuring higher concentrations is greater than for lower concentrations. Once the 72-hour numbers are obtained, the per hour rate of extraction can be calculated and then the 16-hour, 24-hour and the any-hour rates can be determined. For example, a family that leaves for a 3-day weekend could return to a 300-ppb or higher dose of t-butanol and would be totally unaware of what they were drinking.

An important aspect of the attached plot is that it shows that the NSF Approval has been applied by the manufacturer to the PEX tubing, even though it does not seem to meet the complete NSF-61 criteria. I purchased an entire box of the tubing and have considerable sample remaining should anyone wish to double check the data. I've been sending my samples to a California State Certified Lab because they calibrate their EPA GC/MS 8260B procedure to include both MTBE and t-butanol.

The other aspect of the attached plot is the tenacity of the t-butanol with time. Eventually it does diminish, but it takes much longer than even I would have expected. It goes well beyond the NSF-61 "*conditioning*" period.

When it comes to performing detailed studies and presenting proposals to NSF, it would be helpful if NSF could fund such studies. Since my company has already demonstrated the expertise to investigate the problem, we would be an ideal candidate for such studies. Please let me know if NSF research funding is available. If so, I will submit a detailed proposal. If NSF funding is not available, I would also like know that as well. Perhaps the EPA, NIH or State of California would be interested in funding additional research. My company has no vested interest

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in PEX products and is not in a financial position to support this type of research on its own much further than it already has.

As you suggested, when it comes to *warnings*, I would like to see the results of NSF's on-going toxicological review of t-butanol. I would expect that such a review will consider the full range and duration of exposure to t-butanol that an unsuspecting family (including infants, children, pregnant women, the elderly, and those with pre-existing health conditions) will encounter in a new home with PEX plumbing. That would include the 1000-ppb (or higher) levels upon initial occupancy, the 300-ppb levels that are likely to be encountered after a 3-day weekend, as well as the many months that the 16-hour 60-ppb levels persist. For example, since t-butanol acts as an intoxicant, recovered alcoholics might be prone to an increased risk of relapse (and never know why). An asthmatic taking a shower (breathing the t-butanol and MTBE) might be susceptible to an asthma attack (and never know why). My view at this time is that the Homeowners, the Plumbing Contractors, and the New Home Builders all need to know about this issue. With warnings, at least all parties would be making informed choices. No such informed-choice is possible without relevant information. It has been my experience that Plumbing Contractors and Home Builders both look to NSF for guidance and assurance of public safety.

While I welcome your invitation to develop and present specific public health issues before NSF Committees, the matter of warnings is really in NSF's hands now. It should not be up to me or my company to investigate this any further, at least not without NSF funding. The responsible parties are the NSF and the manufacturers of PEX tubing, not Chemical Accident Reconstruction Services, Inc.

Finally, I would like to make clear that my involvement in this matter has developed entirely by accident. As already noted, neither I nor my company has any vested interest in PEX tubing. When my company was hired to determine the source of drinking water contamination in new custom homes, the most likely scenarios at that time were accidental contamination or intentional sabotage. Since t-butanol and MTBE are also signatures for gasoline, a lot of time was spent exploring that possible origin. The Plumbing Contractor and the PEX Distributor told me, in person, that there was "no way" the contamination could come from the PEX piping. I am not saying that they were dishonest. That was their belief at that time. Hence, not even Plumbing Contractors and PEX Distributors understand this issue. Once I discovered where the contamination was coming from, I felt a scientific, social and moral responsibility to bring it to NSF's attention.

Please let me know if I can be of any further assistance to NSF.

Sincerely,

Michael Fox, Ph.D.
Founder

CC: Clif McLellan

NSF-61 Protocol

