

**From:** LC M [b.75@live.com]  
**Sent:** Monday, November 23, 2009 12:00 PM  
**To:** Barbara O'Neal; Park, James; Ramsey, Kevin; ashley.riffle@nrc.com; Habighorst, Peter; jdurham@swri.org  
**Subject:** RE: Mutagenic Activity of Surface Waters...../Karst & "Whole Mixtures" Issues raised in our meeting, attached article & ATSDR report

James, Peter, Kevin, Ashley & Jim,

I also want to thank you for meeting with Chris Tipton, Barbara O'Neal and me, and want to amplify what Barbara just wrote. Specifically, in the abstract from "Mutagenic Activity of Surface Waters" that Barbara sent you, please note that the issue of mixtures -- the problem that ATSDR said may be at work in Erwin -- is raised:

"Because tester strain TA102 detects oxidative mutagenesis due to x-rays and ultraviolet radiation, it is possible that the observed mutagenicity of creek water extracts was due to radionuclides complexed to TBE."

You can find the ATSDR's statement of concern about mixtures in the "Public Health Assessment" included in your package. See page 25: "Because the contaminants present in the groundwater are a mixture of many volatile organic compounds, health effects of mixtures may be an issue."

Further, please also note that on page 25 of the ATSDR report, that our "Karst formations" added another complexity to the assessment of NFS's public health impacts: "The lack of knowledge about the karst formations is of concern for there is insufficient data to determine if the contaminants associated with groundwater in this area will impact public wells in the future." Therefore, ATSDR could NOT state outright that NFS was NOT currently a public health hazard, nor that it wouldn't be one in the future -- hence, the use of the qualifier "Apparent".

If, in a Public Health Assessment, ATSDR could not make a definitive statement on the health hazards of NFS's operations --

"no available studies directly characterize health hazards and dose-response relationships for exposures to "whole" mixtures containing 1,1,1-trichloroethane, 1,1-dichloroethane, trichloroethylene, and tetrachloroethylene. Furthermore, physiologically based pharmacokinetic (PBPK) models have not been developed to predict dispositional and toxicological outcomes of joint action of mixtures of these four chemicals. Similarly, interactions of heavy metals with other heavy metals or organic compounds are unknown at this time." (p.25) --

without detailed studies of our karst topography and of the health impact of "whole mixtures" (studies which can only be accomplished through taking the NEPA-required "hard look"), how can NRC expect to accomplish this necessary research in only an Environmental Assessment?

Hope you had safe travels home and that you have a Happy Thanksgiving,

Linda.



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Subject: Mutagenic Activity of Surface Waters.....

James, Peter and Jim:

Thank you for taking time to meet with Linda Modica and I on Nov. 17 from 1:30-3:45. I hope the two 3" binders of information we provided will be helpful for the NFS Environmental Impact Statement (thinking positively!).

Regarding the information we provided...you will recall that we gave you 6 pages of a 1985 academic article from the Archives of Environmental Contamination and Toxicology, entitled, "Gross Alpha and Beta Radioactivities Associated with Aquatic Environments of Upper-East Tennessee Impacted by Industrial and Mining Activities."

During our discussion, we mentioned another academic article written two years later (1987) by the same authors. The title is "Mutagenic Activity of Surface Waters Adjacent to a Nuclear Fuel Processing Facility." (see attached abstract and preview). This is all we are able to get without ordering the full document from SpringerLink. It does appear to be a good article, and as you can see it specifically discusses Nuclear Fuel Services, Inc., Erwin, TN. Perhaps you or your contractor would have access to this document.

Best wishes for a Happy Thanksgiving,

Barbara O'Neal

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### E-mail Properties

Mail Envelope Properties (BLU104-W2B5BFE62C89542DF13D05ED9E0)

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Issues raised in our meeting, attached article & ATSDR report  
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