

Scott Smith (Chief Technology Officer & Investigator) - Water Defense Flint Water Crisis – Summary 3/10/16

There are continued reports of health impacts due to drinking, bathing, and showering water exposure in Flint, including rashes. Government officials are not fully testing water that humans are exposed to in their homes, so they cannot rule-out the cause. Nor have they conducted the proper assessment of risk by evaluating exposure pathways or effects screening. Proper evaluation of exposure requires monitoring as does effects.

Health officials have narrowly focused on the ingestion of lead contaminated drinking water as the primary threat to health because the lead levels were so outrageous and lead is easy for them to explain. They have not, however, addressed the clear health impacts caused by exposure during bathing. EPA knows the primary exposure route for THMs, chemicals that are formed by chlorine reacting with organic material in your water, is bathing, not ingestion. We found very high levels of THMs in people's homes. Yet, officials are only choosing to test for lead and copper. It appears that other than Water Defense, agencies are ignoring other chemicals in the water. This needs to stop.

Testing Water Defense has conducted shows officials do not understand plumbing systems or the water that's inside it. You can't find dangerous chemicals that you don't look for. Unlike government agencies we have conducted testing at multiple locations inside homes – for example bathtub / shower / sink / water heaters. It appears that Government Agencies are only testing 1 or 2 sinks in a household. To declare water safe for a house, you must test the water as it enters the house and follow it through to all human exposure points – sinks, bathtubs, etc.

It is unclear if phosphates are working. Officials have shown no data supporting this claim and are choosing to not fully understand the water in your homes. A reduction in system-wide lead levels corresponds to the switch to Detroit water, completely different water chemistry. We've found very high levels. At the same time people stopped using their water so drinking water is staying longer inside pipes. Some homes still have extremely high lead levels.

Based on current drinking water regulations, EPA says that the drinking water provided to the community is deemed safe if 10% of the homes have lead levels that exceed their 10 ppb lead drinking water limit. The people of Flint should not stand for this. Everyone should expect water that comes out of their faucet not to harm them, their family, and friends in their homes.

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Government agencies have been handing out pamphlets in Flint claiming that the water is safe to bathe with. Since January and even as recent as a few days ago, we have tested drinking water inside homes. We have detected concerning levels of chloroform, lead, methylene chloride, and 1,4 dichlorobenzene with both grab samples and cumulative exposure water testing. Furthermore, irrespective of the levels of these chemicals detected, no human being should be bathing or showering in any level of these chemicals in water. The government has not tested for all of the chemicals in your drinking water, bathing water, or showering water. They lack evidence to support their claims.

Below is a summary of more details:

1. Water Defense has tested 7 homes and 1 hotel. It appears that Water Defense is the only organization doing independent testing of bathtubs / showers / sinks for the full spectrum of chemicals. In all of these test locations, we have found volatile chemicals including trihalomethanes (chloroform), 1,4 dichlorobenzene, and methylene chloride. (Please see attached summary charts of Water Defense testing). All of these chemicals are either carcinogens or suspected carcinogens.
2. We used an independent, commercial laboratory (ALS Environmental) to conduct the water analysis. They apply appropriate QA/QC techniques so we know the chemicals detected were actually present in the water.
3. I am not aware of any standards for human exposure to these chemicals in bathtubs and showers. Comparing drinking water or other outdated testing standards to human exposure to these chemicals in bathtubs and showers can be misleading. If the EPA or any other agency has any studies on human exposure data relative to the chemicals we found in bathing and/or shower water, I would like to review.
4. We found very high levels of phosphorus in water heaters, bathtubs, showers. We have also continued to find lead in some of these locations within the homes tested. The orthophosphate may not be working to coat galvanized and other pipes to prevent particulate lead from ending up in bathtubs, showers, and sinks in homes downstream of the piping.
5. Where is the detailed EPA testing data? Has the EPA and/or the State of

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Michigan tested for the full spectrum of chemicals and locations including bathtubs, showers, and sinks where humans come into contact with water? I would like to review the EPA testing data side by side with the Water Defense data.

6. Water and contamination are not in a closed loop system – therefore, bathtub / shower / sink water flowing in from the city water is not in equilibrium or a steady state. This is why more testing is necessary with grab samples along with exposure or cumulative testing, before the water is declared safe to shower and bathe in. Has the EPA tested any water heaters, showers, or bathtubs? If not, on what basis is the EPA claiming the water in Flint is safe to shower or bathe in.
7. Is the EPA testing for hardness, alkalinity, conductivity/salinity, and ammonia? If not, this needs to be done. Need to assess the disinfection byproducts. Has chlorine been the main disinfection product? Has any chloramine been used in any part of the water system in Flint for disinfection? This is important to know to better understand why Water Defense is finding the chemicals of concern in bathtubs and showers and sinks.
8. When homes are tested and before any conclusions can be made that water is safe to bathe in the following needs to be done:
 - a. Test the state of the water as it enters the home.
 - b. Test the water heater.
 - c. Understand if the home has galvanized pipes, copper pipes, or both.
 - d. Test all sinks, bathtubs, and showers in homes where humans are exposed. Testing once per month is simply not enough to declare the water safe.
 - e. Test for the full spectrum of chemicals – all metals and VOC's.
9. If the EPA is aware of any extensive studies or standards done by toxicologists to support their conclusions that the Flint water is safe to bathe and shower with, I would love to review this data with my toxicology team. We are concerned that basing the safety of the water for bathing and showering on drinking water standards and/or the absence of bathing / showering standards is compromising health and human safety in Flint. Note that the chloroform type compounds can enter the body through the skin and

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are inhaled directly. The EPA knows this because they have established limits for exposure to many of these compounds.

10. The EPA has made the following statement; “We are coupling the sampling for disinfectant byproducts with sampling for chlorine, a disinfectant. We are sampling for chlorine twice a month.” Question: On what basis does the EPA believe that twice per month is adequate to protect health and human safety? What about the other chemicals?
11. The EPA has also made the following statement, “We have are testing water in more than one point in a home and we are coordinating our efforts with health agencies.” Questions: What does this mean? Where are the details including the detailed test reports? How are these locations selected? Is hot water included?
12. The EPA also made the following statement, “It is still safe to bathe in unfiltered tap water.” Questions: Based on what? Have they conducted a full chemical characterization of the water?. Do they have adequate toxicology data to support that there isn't exposure, accumulation, and finally do they dismiss the effects observed?