

Joliet Alternative Water Source Study

Topic #7: Switching Water Sources – What happened at Flint?

April 8, 2019

Different water sources have different raw water quality and different water quality treatment which result in differing water chemistry. Similar water sources (such as Lake Michigan Water) with similar water treatment (such as conventional coagulation, sedimentation and filtration treatment) will have similar water chemistry. Understanding the water chemistry between the different water sources is key to making sure that a situation like Flint does not occur.

For communities with lead services, water system operators are concerned about the corrosivity of water. The more corrosive the water is, the more potential there is for lead to leach from the lead service line into the drinking water going to that home. Conversely, if the water is less corrosive, it can be scale-forming which can reduce the carrying capacity of the pipes in the water distribution system. There are many corrosion indexes that can be used by water system operators to calculate the water's corrosivity, such as the Langelier saturation index (LSI), which takes into account water quality parameters such as pH, temperature, calcium hardness, alkalinity and total dissolved solids. It is a water treatment balancing act to achieve a water chemistry that is somewhere between slightly corrosive and slightly scale-forming (LSI between -0.3 and +0.3).

Bottom line, what happened at Flint was that when the City switched sources, they did not continue their corrosion control treatment as mandated by the Lead and Copper Rule for communities with a population over 50,000. Instead, they took a "wait and see" approach to determine if corrosion control would be needed with the new water source. This, along with higher concentrations of chlorine in the new water source, resulted in the higher potential for lead to leach into the drinking water of homes with lead service lines.

The following article contains animations which show what happened in lead services in Flint before and after the switch (with and without corrosion control): <http://time.com/4191864/flint-water-crisis-lead-contaminated-michigan/>.

The following article is a very detailed, technical explanation of what happened at Flint: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5353852/> This article also addresses the water chemistry change which resulted in water with a higher corrosivity.

As part of the Phase I and Phase II Studies, City Staff and project team members have met with IEPA (Illinois Environmental Protection Agency) Permitting Staff to discuss the new water source. One of the topics of discussion is impact of the switch on the City's corrosion control currently in place. Be assured that the City will be continuing its corrosion control treatment with the new water source and will be monitoring the new water's corrosivity and the distribution system to make sure the potential for higher lead leaching is not present. In addition, the City is actively moving forward with the lead service line inventory required by IEPA to identify where lead services are located and is offering a cost share program to residents when lead water service lines are identified. For more information on this program visit the City's website: <http://cityofjoliet.info/departments/public-utilities/programs-projects/lead-water-service-line-inventory-replacement-program>.