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Sent: Friday, June 20, 2014 4:07 PM
To: Johnson, Mark
Cc: Poy, Thomas; Prysby, Mike (DEQ); Busch, Stephen (DEQ); Shoven, Heather; Murphy, Thomas
Subject: Briefing — Flint River for drinking water, Michigan
Attachments: Flint River Test Run Phase2 5 July 2013.pdf; GENESEE-2014-05-30.pdf; GENESEE-2014-05-27.pdf; Flint04-2014MOR.pdf

Mark—as we discussed earlier this week, below is a briefing containing the information we discussed regarding the Flint, Michigan water supply. I am out of the office this coming week; if you have questions, please contact Tom Poy, Ground Water and Drinking Water Branch Chief.

Thank you for your time!

Jennifer

Drinking Water in Flint, Michigan

ISSUE: Flint began pumping/treating/distributing Flint River water as their drinking water source on April 25, 2014, and beginning in mid-May, there have been numerous complaints to the Region 5 Ground Water and Drinking Water Branch regarding the drinking water, including rotten egg smell, swamp water smell, people developing rashes. The Region immediately contacted and involved the Drinking Water program at the Michigan Dept of Environmental Quality (MDEQ).

BACKGROUND: Flint has been purchasing finished drinking water from Detroit for decades (source water is Lake Huron). It has been delivered by a large single pipeline from Detroit. In the late 1980's, the State drinking water staff requested that Flint renovate their old surface water treatment plant to meet the State's redundancy requirements, in case the single pipeline from Detroit was unable to transmit finished drinking water. Flint would treat Flint River water periodically throughout the year, to verify that the water treatment plant (WTP) was able to treat Flint River water that met Safe Drinking Water Act (SDWA) standards.

Over the past 15 years or so, Detroit has seen a decrease in its City population, and an increase in poverty/low income residents. Detroit currently has an Emergency Manager due to poor financial situation. (As an aside, last year the City of Highland Park told Detroit it was unable to pay its water/sewer bills, and currently has an Emergency Manager. Highland Park was unable to obtain funding to retrofit its surface water treatment plant, so Detroit is providing water/sewer currently to Highland Park for free.) In order to continue to provide adequately treated water that meets SDWA Health standards, the suburbs have been subsidizing the lower income residents for years. Consequently, communities like Flint have decided to find an alternate source of drinking water.

A regional water authority was formed in 2010, the Karegnondi Water Authority (KWA), which will serve water in mid-Michigan and the Thumb areas. Members of the KWA include Flint, Lapeer; and Genesee, Lapeer and Sanilac Counties. The KWA is currently constructing the Karegnondi pipeline to bring raw water from Lake Huron. It will be completed in about 2 years. Flint has an Emergency Manager now, and I think on paper, it looked like a savings to pump and treat Flint River water for the 2-year interim period prior to connecting to the Karegnondi pipeline, than to continue to pay Detroit prices for finished drinking water. MDEQ has worked long and hard with the City of Flint and water operators to

get the WTP ready to treat Flint River water for the next few years. Complete operation/treatment began April 25, 2014.

In mid-May, Region 5 Ground Water and Drinking Water Branch began receiving calls from Flint citizens regarding the quality of the Flint drinking water. Complaints include rotten egg smell, swamp water smell, people developing rashes. I talked with Richard Benzie, the Community Drinking Water Unit Chief, at MDEQ about any possible chemical releases into the Flint River, and neither he nor Mike Prysby, the Lansing District engineer for Flint, have heard of anything such as this. The normal procedure of chemical releases is that Mike Prysby and Richard would be alerted/notified through the Pollution Emergency Alert System (PEAS), and that hasn't happened.

Mike Prysby has been working quite closely with the Operator-in-Charge at the Flint Water Treatment plant to prepare the WTP and operators to treat the Flint River water. Attached are several analytical results: July 2013 Test Run of Phase 2/5 contaminants conducted on the Flint River, sampled in July 2013; no exceedances are noted; detects of barium and selenium. The April 2014 Monthly Operation Report (MOR) which includes bacteriological analyses, was finalized in mid-May (includes only April 25-30 operation activity) with the following test results (sampled in May 2014), that were provided last week by Steve Busch, the MDEQ Supervising District Engineer: Total Organic Carbon (TOC), Metals, Volatile Organic Carbon (VOC), Synthetic Organic Contaminants (SOC) (all 3 categories), and partial chemistry (which includes nitrates). As the WTP only operated for the last 6 days in April, the MOR results provide limited information. The Bacteriological Portion of the May Operating Period were due 6/10, but the operational monitoring won't be reported until 6/30.

FINDINGS: So, bottom line—yes, the raw water is a different quality and more variable than Lake Huron raw water that Detroit is using. The Flint River is not as high a quality water as Lake Huron, but they are pretreating with ozone, conducting softening to reduce hardness and organic precursors, and are working with chlorine application. And, the Flint River is an interim source of raw water until the Karogonondi pipeline is constructed to bring raw Lake Huron water to Flint for treatment.

When you look at the July 2013 Test Run analyses attached, note:

The sample was taken at the Filter Effluent—normally it would be taken at the plant tap, but they were running Flint River water through most of the plant last summer to test treatment, and the filters were the last stop before the clear well/plant tap which were filled with Detroit water they were serving last year. Note: Trihalomethanes (TTHM) are detected, but no exceedances. Detects could be due to: Softening had not been introduced to the treatment process last summer which would reduce the hardness and also remove some of the organic precursor that would add to TTHM levels. Softening is being conducted now in the treatment process. Last summer, chlorine was added in mid-treatment which also could have added to the TTHM level. Now, chlorine is added just before the filters. Also, since it's summer surface water, there will be more run-off, thus more precursor in the raw water. Mike Prysby, the MDEQ District Engineer, believes that today's operation of the plant and quality of drinking water produced is much better than the test runs done over the past year, due to the adjusting of the treatment, such as the softening process and the chlorine application.

Mike received Flint's first Monthly Operation Report (MOR) for the timeframe of April 25-30. Ozone pretreatment is provided to the raw water, and there is ozone destruction at the end of the pretreatment. The Filter Effluent has never been over 0.3 NTU, the ave range is 0.12-0.21 NTU. The chlorine residual at the plant tap is 0.9-1.0 free chlorine. The distribution chlorine residual ranged from 0.7-1.0 of free chlorine, which is acceptable. Bacti samples are pulled every 3-4 hours starting on April 25-30, and all were clear.

CONCLUSION: The analyses show some detects of regulated contaminants, but no exceedances. Thus, we have no report on any regulated contaminant that might be causing rashes, and the complaints we're hearing. I did ask Steve Busch at MDEQ, if there was a possibility of the existence of cyanotoxins from algae on the Flint River. Steve has worked with systems in Southeast Michigan and with Ohio EPA on algae issues, and he didn't think the conditions of the Flint River would support an algae bloom that would cause cyanotoxins to be present.