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Sent: Wednesday, January 31, 2007 4:12 PM
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Subject: Testing of consumer GAC filters
Attachments: GACFilterTestSummary.doc

Yesterday I collected samples using St. Paul Park city water to try to measure the effectiveness of common consumer water filters that contain GAC in removing low levels of PFBA. I hope to have the results available next week, before the community meetings scheduled for the week of Feb. 12th. Attached is a summary of the work. The SAC unit is paying for the analysis of the samples. We have also collected samples from three of the large whole-house GAC filters in Lake Elmo that filter well water containing only PFBA. Hopefully this will give us a better idea on GAC performance for PFBA removal.

If you have any questions please let me know. I will communicate the results as soon as I receive them from the lab.

Jim

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Summary of Testing of Consumer Water Filters Containing GAC for PFBA Removal
1/30/07

This project was conducted in the city of St. Paul Park, Minnesota, on January 30, 2007. The goal of the project was to measure the effectiveness of several types of commonly available consumer water filters containing granular activated carbon (GAC) in removing perfluorobutanoic acid (PFBA) from municipal water. PFBA has been detected in the three wells serving the St. Paul Park municipal water supply at the following concentrations:

Well Number	Date	PFBA, ug/L
Well #2	1/3/2007	1.85
	1/9/2007	2.27
Well #3	1/3/2007	1.23
	1/9/2007	1.99
Well #4	1/3/2007	1.43
	1/9/2007	1.82

Testing was conducted at two locations. The first was at a private residence in the city located near city well #2. The resident had recently (January 20, 2007) installed a reverse osmosis water filter unit (Omni Model RO2000) that contains pre- and post- RO filters that contain GAC. Two samples were collected at the residence for analysis for PFCs at the MDH Public Health Laboratory (Method 555):

1. A raw, unfiltered water sample from the kitchen faucet (SPP Raw1)
2. A sample from the tap serving the RO unit (SPP RO1)

The remaining tests were conducted at the St. Paul Park city hall complex, in a kitchen serving the fire hall. A raw, unfiltered water sample was collected from the cold water tap in the kitchen sink after flushing for several minutes (SPP Raw2). It was noticed that at first the water was warmer than seemed usual for a cold water supply; later I was informed that a water main break had occurred in the city and this may have explained the occurrence. The St. Paul Park municipal water system is not chlorinated.

Two sets of filter experiments were conducted. The first involved a water pitcher equipped with a GAC filter, designed to filter small quantities of water for drinking or cooking (Brita water pitcher model OB25 w/new filter model #OB03, obtained at Target). The filter is rated at 40 gallons before a filter change is recommended. The process for collecting the samples was as follows:

1. The filter was soaked for 5 minutes in tap water as directed by the manufacturer.
2. The filter was placed in the pitcher and one gallon of water (measured using a empty plastic one gallon milk container) was filtered. Small particles of GAC could be observed in the initial batch of water. This water was discarded as suggested by the manufacturer.

3. Additional water was added to the pitcher and an initial sample was collected (SPP BR1).
4. Filtering of water continued until a total of 10 gallons (25% of the rated filter capacity) was run through the pitcher. A second sample (SPP BR10) was collected. The rate of filtration began to slow appreciably.
5. Three additional gallons of water were filtered, for a total of 13 gallons (33% of the rated capacity). A third sample (SPP BR2) was collected. Total time to filter 13 gallons was approximately five hours.

The second experiment was conducted using a faucet-mounted filter (Pur model FM-4100, w/new filter model #RF-9999, also obtained at Target). The filter is rated at 100 gallons before a filter change is recommended, and the unit contains a simple gauge estimating how much of the filter capacity has been used based on water use. The process for collecting the samples was as follows:

1. The filter was installed according to manufacturers directions and flushed for 5 minutes.
2. An initial sample (SPP PU1) was collected immediately after the filter has been adequately flushed for analysis for PFCs.
3. The flow rate through the filter was measured using the gallon jug and calculated to be approximately 0.67 gallons per minute. The flow rate remained relatively constant throughout the experiment.
4. Approximately 50 gallons of cold tap water was run through filter until so that 50% of filter capacity was been used up according to manufacturers directions. The red indicator bar on the unit's gauge was fairly close to the midway point. A sample (SPP PU2) was collected.
5. An additional approximately 30 gallons of cold tap water was run through the filter so that an estimated 80% of filter capacity had been used. Again, the gauge fairly closely tracked the estimated water use. A final sample (SPP PU3) was collected.

The samples were delivered to the MDH Public Health Laboratory for analysis under chain of custody #21167 at 2:40 pm on January 30, 2007.