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EPA ID # NJ01298 NJ DEP ID # 03048 NY ELAP ID # 12044

PERFLUORINATED CHEMICALS REDUCTION TEST REPORT

Report # 16-296-Perflurinated Chemicals Reduction Test (Gravity Black Berkey Filter).
Customer Name: New Millennium Concepts, Ltd.
Report Date: 07/23/2016.

EXECUTIVE SUMMARY

Twenty five gallons of tap water was spiked with Perfluro Octanoic Acid (PFOA) Standard Solution to have a final concentration of 1 ± 0.25 µg/L, the spiked tap water was filtered through the filter element and tested; the PFOA Standard Solution in the tap water was reduced by 99.9%.

INTRODUCTION

Twenty five gallons of tap water was spiked with Perfluro Octanoic Acid (PFOA) Standard Solution to have a final concentration of 1 ± 0.25 µg/L, the spiked tap water was filtered through the filter element and tested; the spiked solution and the filtered solution were tested by GC/MS after methylating the acid to a methyl ester with Methanol and extracted with Hexane using SPE extraction disks; the PFOA Standard Solution in the tap water was reduced by 99.9%.

REAGENTS AND LAB EQUIPMENT

Gravity Black Berkey Filter.
Perfluorooctanoic acid (PFOA) reagent grade 96%+, Aldrich cat 171468-25G.
HP 5890/5972 GC/MS System.
Restek GC column Stabilwax 30m, 0.25 mm ID, 0.25 um df, catalog 10623-124.
Type A glassware for drinking water analysis.
Solid Phase Extraction Disk 3M Empore™ Styrene Divinyl Benzene (SDB-XC) 47 mm Supelco catalog 66884-U.
Methanol, Fisher HPLC grade A452-1.
Hexane, Macrone Fine Chemicals, reagent grade H487-10.
Thelco oven model 16.

PROCEDURE

Twenty five gallons of tap water was spiked with PFOA Standard Solution in a Tank and mixed well; this solution was tested and adjusted to have a final concentration of 1.0 ± 0.25 µg/L of PFOA, the results are summarized in Table 1 below. The solution was filtered through the Black Berkey Filter, one liter samples were collected and extracted using the SPE disk 3M Empore SDB-XC, following the water extraction the disk was extracted with Methanol, this solution was heated in an oven at 60°C for 4 hours, then extracted with Hexane and tested by GC/MS. The results are summarized in Table 2 below.

RESULTS

Table 1
Spiked Tap Water Properties

Parameter	Influent Water Properties	Target
pH	7.67	7.00 to 8.00
TDS	56.2 mg/L	50 to 250 mg/L
Temperature	22.1 °C	20 ± 2.5°C
Turbidity	0.55 NTU	< 1 Nephelometric Turbidity Units
PFOA	1.00 µg/L	1.00 ± 0.25 µg/L
EPA Maximum Contaminant Level (MCL)	Not specified	<0.002 µg/L

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Table 2
PFOA (C8) Water Results

Accumulated Volume	Influent Water Concentration	Filtered Effluent Water Result	% Reduction
Start	1.00 µg/L	<0.002 µg/L	>99.9 %
10 gallons	1.00 µg/L	<0.002 µg/L	>99.9 %
25 gallons	1.00 µg/L	<0.002 µg/L	>99.9 %

CONCLUSION
The Gravity Black Berkey Filter reduced the PFOA concentration in the tap water by at least 99.9% after passing 25 gallons of water through the filter.

Potential Perfluorinated Chemical Contaminants in Water:

Contaminant	Surrogate Influent Water Concentration	Surrogate Filtered Effluent Water Result	% Reduction
Perfluorobutane Sulfonate (PFBS)	1.00 µg/L	<0.002 µg/L	>99.9 %
Perfluorodecanoic acid (PFDA)	1.00 µg/L	<0.002 µg/L	>99.9 %
Perfluorohexanoic acid (PFHxA)	1.00 µg/L	<0.002 µg/L	>99.9 %
Perfluorononanoic acid (PFNA)	1.00 µg/L	<0.002 µg/L	>99.9 %
Perfluorooctanoic Acid (PFOA) (C8)	1.00 µg/L	<0.002 µg/L	>99.9 %
Perfluorooctane Sulfonate (PFOS)	1.00 µg/L	<0.002 µg/L	>99.9 %
Perfluorohexane Sulfonate (PFSxS)	1.00 µg/L	<0.002 µg/L	>99.9 %
Polytetrafluoroethylene (PTFE)	1.00 µg/L	<0.002 µg/L	>99.9 %
Fluorotelomer alcohol 8:2 (PTOH)	1.00 µg/L	<0.002 µg/L	>99.9 %

Note: Surrogate test based on the results of PFOA (C8) used as the surrogate compound.

CERTIFICATION OF RESULTS:
I certify in writing that all analyses, and reporting performed herein, comply with all requirements set forth in N.J.A.C. 7:9E and N.J.A.C. 7:18, and hereby certify that this laboratory is in compliance with all laboratory certification and quality control procedures and requirements as set forth in N.J.A.C. 7:18; the NYCRR Subpart 55-2 and the National Environmental Laboratory Accreditation Conference (NELAC) Institute Standards.
Disclaimer: The test results are only related to the filter sample tested.

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