



Graver Technologies

Filtration | Separation | Purification

MetSorb® HMRG Outperforms Competitive Products

MetSorb® HMRG outperforms competitive products in pilot study for removal of arsenic from drinking water

Elevated concentrations of arsenic are found in many regions of the world. Naturally occurring arsenic in drinking water affects about 10% of the drinking water supplies in the United States, especially groundwater supplies. One of those supplies is located in Hopewell, New Jersey. Graver, in conjunction with researchers from Stevens Institute of Technology and scientists from the New Jersey Department of Environmental Protection, conducted a pilot test of the well water to demonstrate an efficient and economical way to reduce the arsenic levels.

Typical Water Analysis

| | |
|-------------|----------------------------|
| Arsenic | 40 parts per billion (ppb) |
| Arsenic V | 37 ppb |
| Arsenic III | 3 ppb |
| pH | 7.9 |
| Silica | 20 mg/L (ppm) |
| Sulfate | 60 mg/L (ppm) |

The Testing

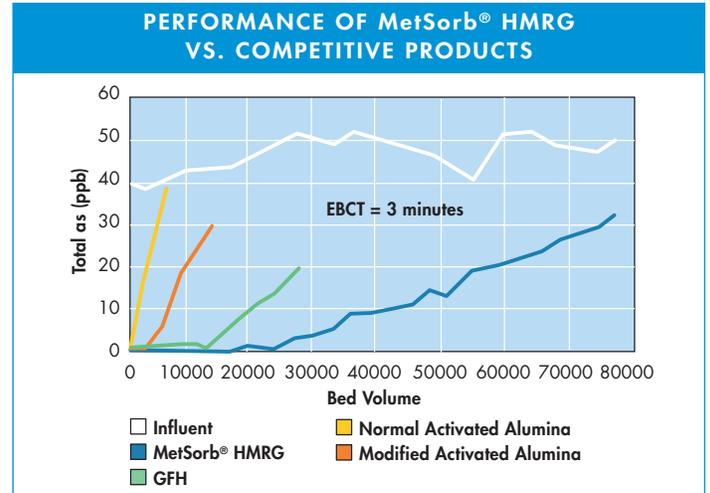
Several adsorptive media (an iron based product, activated alumina, modified activated alumina, and MetSorb® HMRG) were tested side by side on the Hopewell well water in identical test units.

All were tested with an empty bed contact time of three minutes and the units were run beyond a breakthrough of arsenic in the effluent water of 10 ppb (the new Federal standard for allowable arsenic in drinking water). No preconditioning of the water was done.

Test Results

Based on these tests, the treatment capacity decreased in the following order:
MetSorb® HMRG > Iron based media > Modified activated alumina > Activated alumina.

See the table for the total treated number of bed volumes prior to breakthrough.



Results Table: Breakthrough Volumes to 10 ppb

| Media | Bed Volumes |
|----------------------------|-------------|
| MetSorb® HMRG | 42,000 |
| Iron based media | 22,000 |
| Activated alumina | 2,000 |
| Modified activated alumina | 8,000 |

The complete breakthrough curves are shown in the graph as well, and clearly indicate the superiority of the MetSorb® HMRG in removing the arsenic.

Operating costs of the MetSorb® HMRG system are estimated to be substantially lower than for the other adsorptive media. These costs comprise mainly the periodic replacement of the media and the disposal of the spent media (typically adsorptive media for arsenic removal are not regenerable but rather a one time use). The use of the media is therefore optimized by running two adsorbers in series in a lead/lag mode, thereby allowing a greater utilization of the capacity of the MetSorb® HMRG. The spent MetSorb® HMRG has been tested by the Toxicity Characteristic Leach Procedure, and has been determined to be nonhazardous waste.

The operating cost is also very dependent on the inlet levels of arsenic; as might be expected, lower operating costs are seen for an inlet of 15 ppb of arsenic than for 50 ppb.

For more information

MetSorb® HMRG Customer Service: 1-800-533-6623



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