



## HANNIBAL BOARD OF PUBLIC WORKS

### ELECTRIC, WATER AND WASTEWATER

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**DATE:** January 26, 2016  
**TO:** Hannibal Board  
**FROM:** John E. Hummel, P.E.  
**Re:** Recommendation to Use GAC in the WTP Filters

The Horner & Shifrin Inc. (H&S) Engineering Study evaluated several options to help the Hannibal Board of Public Works (HBPW) meet the Disinfection by Products (DBP) limits and ranked them in order depending on final construction and maintenance costs and other operational factors. To help keep water rates reasonable it was determined to proceed with the use of chloramines which are a combination of chlorine and ammonia.

Some of the rate payers of Hannibal felt this option would provide a less than acceptable product and through the rate payers' research felt converting our existing filters to use Granulated Activated Carbon (GAC) would be a much better choice, and the dollar figures presented in the Engineering Study were inflated. We agreed to take a second look at the GAC and present our findings to the HBPW Board.

There are two main suppliers of GAC in the United States and Canada: All Service Contracting Corp. out of Decatur Illinois, Brian Burcham, and General Carbon out of Paterson NJ, Irwin Benkert. I worked with both these gentlemen and they provided me a cost to remove one foot of existing anthracite and provide and install one foot of GAC.

General Carbon - \$149,300.00  
All Service - \$85,395.00

This particular product will last approximately five years and then the GAC will need to be reactivated at which time we would have the above expense again.

When discussing the option of putting just one foot of GAC on the filters with Brian Burcham, Brian expressed concerns with using only one foot of GAC. By only using one foot of material Brian felt we would not get the results we were looking for in regards to substantial organic removal. The recommended standard is a minimum thickness of 24" of GAC which will give you additional contact time to achieve organic removal that will result in reduce DBP's and lower THM concentrations.

I took the research one step further and double checked to see if this removal and replacement would be sufficient to help with removing the organics, which combined with a chlorine disinfectant will produce DBP's.

Ben Freese with Black and Veatch assisted me with this question. To be effective the filter needs to have a base of a combination of 12" of gravel, 12" of sand and 24-30" of GAC. This would require us to modify our existing filters which would be a major capital construction project. The filters would have to be extended up to provide room to install an additional 18" of material. This would most likely be accomplished with concrete walls, new drains and wash troughs.

When we took another look at H&S, the cost of \$840,000.00 in their Engineering Study included the cost to modify the existing filters to accommodate the additional 18" of material.

There is a high likelihood that if we converted to the GAC Filtration System, we would still need to disinfect with chloramines to have appropriate residual levels and low DBP's to reach the end of Ralls County's distribution system.

At this time I would recommend that we do not go forward with converting our filters to include GAC. We are currently meeting DBP regulations, and I feel the cost of switching to GAC at this time would not be financially responsible for the HBPW or citizens of Hannibal.

***"The mission of the Hannibal Board of Public Works is to provide safe, reliable utility products with excellent customer service at reasonable prices."***

