

ASDWA PFAS Water Utility Treatment Case Study

Town of Blades, Delaware

December 3, 2018



Town of Blades, Delaware: The Town of Blades is located in Sussex County, Delaware in the southwest part of the state.

Initial Testing for Per- and Polyfluoroalkyl Substances (PFAS) Confirms Combined PFOA/PFOS Levels Above EPA Health Advisory

On February 8, 2018 the Delaware Department of Natural Resources (DNREC) and Division of Public Health (DPH) called to inform the Town of Blades that the samples taken from their three drinking water wells were found to have combined levels of Perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS) in the range of 96.2/ppt to 187.1/ppt and were significantly above the US Environment Protection Agency's (EPA) Health Advisory (HA) level of 70 parts per trillion (ppt) for combined PFOA and PFOS. The samples were initially taken by the state at the request of EPA because of the proximity of the wells to historical plating/industrial sites that used PFAS compounds.



Town Issues Public Notice and Provides Bottled Water to Residents

After being notified about the high levels of PFOA/PFOS in the town's wells, the water was deemed not safe for drinking but was deemed safe for washing and bathing. The Town of Blades immediately issued a public notice to all town residents and drafted a press release for the news. The notice and press release stressed that out of an abundance of caution all residents should refrain from drinking and cooking with town drinking water and that the town would have bottled water available for residents and schools the next day (on February 9, 2018). The Governor then signed an executive order calling in the National Guard unit to assist the town with water distribution and activating their water buffalos for delivering water for consumption (for filling jugs with water) until the town was able to install treatment at the water treatment facility for removing the PFOA and PFOS.

The Investigation of PFAS Origination Continues

The Town has no way of knowing how long the drinking water has been contaminated. There were two plating businesses in town in the 80's and 90's. The one next to the town hall closed up in the mid to late 90's. It was then deemed a brownfield site and cleaned up for the known contaminants at the time. There is still an active plating business in the town but PFOA and PFOS are no longer in use or practice since EPA launched the stewardship program in 2006 asking companies to reduce and eliminate their use by 2015.

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The town worked with EPA, who drilled 18 monitoring wells for their contractors to conduct sampling and testing to help determine the PFAS levels and possible origination of the contamination. EPA also conducted sampling for nearby private wells where residents were subsequently provided with small carbon filtration units for their kitchens and one bathroom faucet for one year until the PFAS levels in their wells have decreased. The town is still investigating where the contamination came from and is working closely on this with DNREC, DPH, the Office of Drinking Water, Division of Waste & Hazardous Substances, State Emergency Management, Sussex County Emergency Management, City of Seaford, Town of Bridgeville, City of New Castle, the town's engineering firm, and Delaware Rural Water to determine additional solutions beyond treatment.

Water Treatment Considerations

Information about the town's existing water treatment facility is displayed in the graphic below. The water system serves over 1,300 citizens with 470 connections made up of residential and commercial accounts.

Sources: Wells

Name of Well	#1-40024	#2-40025	#3-248353
Depth of Well (in feet)	95	95	94
Casing Diameter (inches)	10"	10"	10"
Capacity in Gallons Per Minute (GPM)	150gpm	150gpm	150gpm
Installed Treatment	Greensand, Chlorine, Potassium Permanganate, pH adjustment, Fluoride, Granular Activated Carbon	Greensand, Chlorine, Potassium Permanganate, pH adjustment, Fluoride, Granular Activated Carbon	Greensand, Chlorine, Potassium Permanganate, pH adjustment, Fluoride, Granular Activated Carbon

When researching the best treatment options, the town relied on help from the City of New Castle, that had also previously experienced PFAS contamination and had an actively working granular activated carbon (GAC) filtration treatment train in place for a couple of years. The knowledge they imparted to the town with was invaluable, and after researching other options, determined the carbon filtration system was best suited for treatment. The town liked the carbon filtration system because it also removes other emerging contaminants that while not currently regulated by the state, may be found to have potential health effects and be regulated in the future.

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Water Treatment Installation

After the town decided that they wanted to install GAC treatment, they contacted the Calgon Carbon company in Pennsylvania who agreed to work overtime to get the 20,000-pound GAC filtration system in place. Within three days, Calgon had loaded the new filter on a flatbed tractor trailer on its way to the Town of Blades from Pennsylvania. It was installed within 24 hours and after connecting and testing the system, it was online within a week. The time it took from the issuance of the public notice about the drinking water contamination to the filter being installed and ready to go live was less than two weeks. See the following links to press releases and articles written about the town's journey.



- [Town Engineering Firm Press Release on PFAS Contamination Assistance](#)
- [Delaware Online Article on Do Not Drink Notice and Bottled Water Distribution](#)
- [Firststateupdate Article on National Guard Deployment](#)
- [DE Congress Members Media Statement on Blades Water Contamination](#)
- [Delaware Online Article and Videos on Blades Response and Potential Health Impacts](#)



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The carbon filtration system was paid for with assistance from the Division of Waste & Hazardous Substances through the Hazardous Substance Cleanup Act (HSCA) Program. The cost to purchase the 20,000-pound filter, 20,000 pounds of granular activated carbon, delivery, installation, and engineering was approximately \$240,000.00 dollars. Part of this cost covered the engineering plan for flushing out the water system. The town had to flush its tower and all existing water in the distribution system before giving the okay for citizens to use the water for drinking and cooking.



New System Components and Requirements	Costs
20k lb. Calgon Carbon GAC filter purchase, installation, engineering, and flushing	\$240,000.00
Backup filtration system and construction of enclosure	\$1,500,000.00
PFOA/PFAS sampling (every 6 months)	\$1,400.00-\$2,500.00/6 mos.
Disposing and changing carbon (estimated every 3-6 years)	\$33,000.00/3-6 yrs.

Additional Water Treatment Plant Upgrades Needed

The town is now required to purchase and install a back-up filtration system to have continued filtration while changing filters and in case there is a failure with the new system. This type of “train” with two connected filtration systems includes one main filter and one finisher. If the main filtration system fails, then the finisher can serve as a backup for the main filtering of the water. The town also needs to upgrade the water plant to accommodate the additional filter and will pursue grant funding or a low interest loan with USDA that is available to small water systems for emergency situations. The estimate of the cost for the filter and the work to house/enclose the filters is \$1,500,000.00. The town also needs to consider the cost of maintenance and testing for PFOA/PFOS every six months. The cost of sampling/testing can range from \$1,400 to \$2,500 and there are only a few labs in the country that can conduct the testing. Maintenance costs for changing and disposing the used carbon are much harder to determine since they are based on the effectiveness of contaminant removal. It is estimated that the carbon may need to be changed every three to six years. The cost of 20,000 pounds of carbon is about \$33,000.00 dollars with delivery. The town will have to adapt its budget to plan for the variability in potential and unknown maintenance costs.

For more information

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