

Ensuring Safe Drinking Water for a Rural Community

Challenge

Per- and polyfluoroalkyl substances (PFAS) were detected in raw water provided by a municipal supply well, the Maysville Well, in the Town of Maysville, North Carolina. Specifically, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) as well as some short-chain PFAS were detected above the 70 parts per trillion (ppt) EPA Health Advisory, in effect at the time. The Maysville Well pumps groundwater from the Castle-Hayne aquifer and produces around 70,000 gallons of fresh water daily for its approximately 450 customers. The Town retained TRC to prepare a Preliminary Engineering Report (PER), which evaluated alternatives to remedy the PFAS contamination in the well water.



Solution

TRC staff collected and analyzed water samples for metals and various wet chemistry parameters (e.g., hardness, iron, manganese, total dissolved solids, total organic carbon) to gain a general understanding of water quality. Based on the analytical results, TRC evaluated the current treatment system and the technical and economic feasibility of a PFAS treatment system for the well.

TRC assessed three potential treatment technologies to remedy the water: activated carbon, ion exchange resin, and high-pressure membranes. TRC also evaluated three potential water treatment vendors who could supply granular activated carbon (GAC) or ion exchange technology once high-pressure membranes were ruled out. Ultimately, TRC recommended the use of a GAC and ion exchange resin treatment system by ect2 as the best, most sustainable, economically and technically adequate solution.

The selected treatment system was three phased and conditions the water for the best removal efficiency. The treatment process starts by using air to convert some of the



aqueous iron to precipitated iron, followed by greensand filtration to remove about 95% of the iron and manganese.

This process is followed by GAC, which is primarily used to remove any trace iron remaining after the greensand filtration to avoid binding the subsequent resin, and to remove chlorine,

which was fed to the greensand filter, as the chlorine can destroy the subsequent resin. GAC will also begin the process of removing PFAS from the water. Finally, the water is treated by flowing through the ion exchange resin unit to remove the targeted PFAS to a concentration below 70 ppt.

Result

The well's new treatment system will help the Town to become self-sufficient in meeting the customers' demands and eliminating the cost of water being purchased from the nearby Jones County system.

TRC played a key role in securing NC General Assembly and ARPA funds that were utilized for this project. TRC also helped the Town prepare a separate PER to submit to the United States Department of Agriculture to secure an emergency grant to help fund the PFAS treatment.