

Installation, Startup and Operation of the World's First Regenerable Resin System for PFAS Removal

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Background

- Response activities are ongoing to remove and remediate groundwater impacted by PFAS at the former US Pease Air Force Base in New Hampshire
- The two primary PFAS compounds found at the Site are PFOA and PFOS at combined concentrations above the USEPA's Health Advisory Level (HAL) of 0.07 µg/l
- Wood Group PLC conducted a side-by-side pilot test in 2016, comparing the performance of ECT's regenerable ion exchange (IX) resin and Calgon's F400 activated carbon (GAC)
- The regenerable resin system was selected for full-scale application, based on system performance and a lower overall lifecycle cost than GAC



Aerial view of former Pease Air Force Base

Objectives

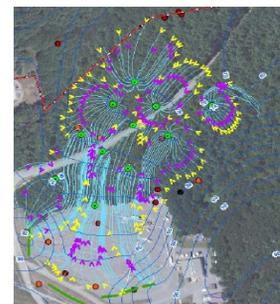
- Install a full-scale regenerable IX resin system capable of treating up to 12.5 Lps of PFAS-contaminated groundwater from the former fire training center.
- Control off-site migration of the PFAS plume, while consistently maintaining treated effluent less than the 0.07 µg/l HAL.

PFAS Compound	Average Influent Concentration (µg/L)
PFOA	11.5
PFOS	27.4
Other PFAS	55.6
Total PFAS	94.5

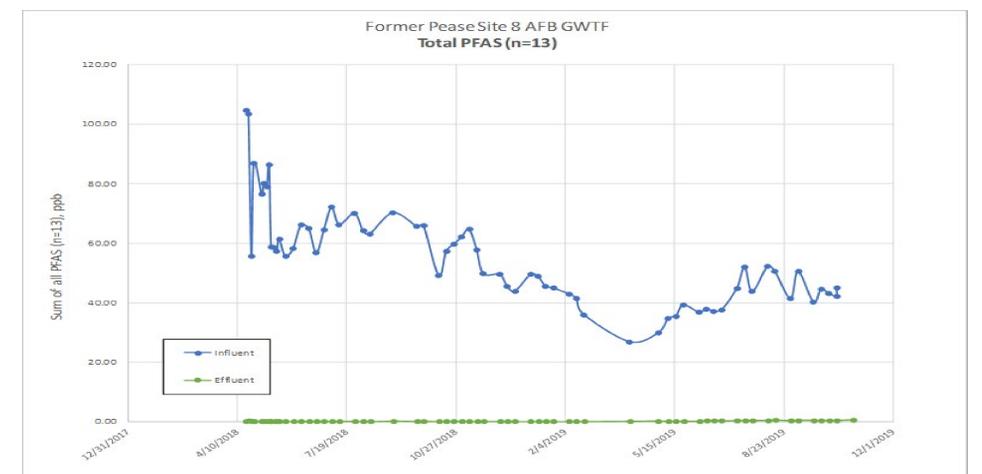
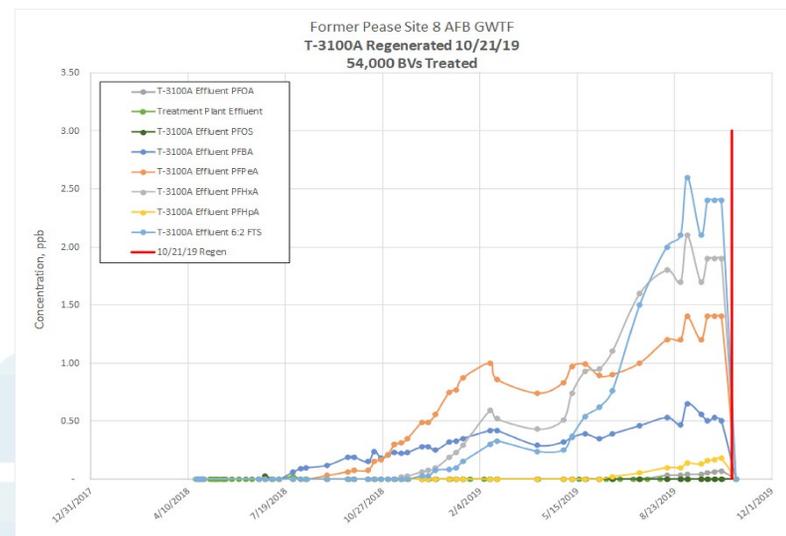
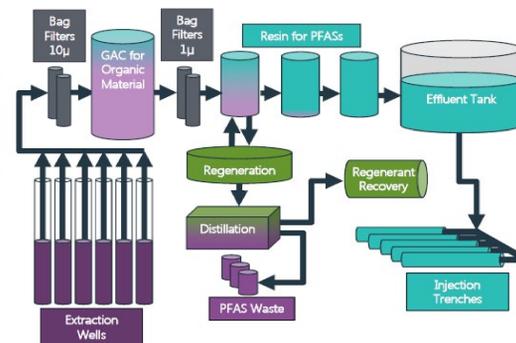
Approach and Results

The PFAS removal system includes:

- Bag filters to remove suspended solids
- Back-washable GAC pretreatment filtration to remove organic compounds and iron
- Two parallel trains of lead-lag regenerable IX resin vessels for PFAS removal
- An in-vessel regeneration system to strip PFAS from the IX resin
- A distillation system to recover and reuse the regenerant solution
- A PFAS super-loading system to further reduce PFAS waste volume
- Two parallel, single-use IX resin vessels for PFAS polishing. The polish vessels contain a blend of IX resins, tailored to the general water chemistry and PFAS species and their relative concentrations



- Extraction design: 110 gpm
- Treatment capacity: 200 gpm



Summary and Conclusions

- The regenerable resin system is highly effective at treating waters impacted by PFAS
- Multiple successful resin regenerations have been performed to date. Operational modifications have been made to address and correct minor challenges with the distillation system
- The original super-loading media is still operational, having removed and concentrated greater than 99.99 percent of the recovered PFAS mass, and therefore no PFAS waste has needed to be hauled off site after more than a year of operation