

# Bench Test Using OxyZone® on Fluorinated Compounds in AFFF Contaminated Groundwater



## Highlights

In-Situ Chemical Oxidation (ISCO) using OxyZone® has been used to bring sites with persistent and recalcitrant contaminants to closure. In this case study, OxyZone® has been demonstrated to be an effective treatment method to destroy Poly and Per Fluoroalkyl Substances (PFAS) in aqueous film-forming foam (AFFF) contaminated groundwater.

Advisory levels. An existing pump and treat system was reactivated and the PFAS contaminated groundwater was treated with granulated activated carbon (GAC). The GAC requires periodic regeneration to remove the PFAS from the carbon. The site manager contacted EnChem Engineering to perform a bench scale treatability test using OxyZone onsite groundwater from two different portions of the source area contaminated with AFFF.

## Site Details

Site: Fire Training Area, Massachusetts

Contaminant: PFAS (PFOS and PFOA)

Geology: Permeable sand and gravel

Challenge: Destroy PFAS in AFFF contaminated Water

Remediation: OxyZone ISCO process

## Results

The test results show 99% removal of PFOS and an overall 70% PFAS removal after 9 hours of treatment. Six of the fifteen detected PFAS compounds were removed to below detection limits ranging from 0.1-0.2 ppb. Most interesting was that, for one groundwater source, the amount of fluoride released was almost eight times the amount of fluoride contained in the identified PFAS. This can be explained by the presence of a significant amount of other, un-identified PFAS associated with the AFFF in the groundwater. Based on the bench scale treatability tests, OxyZone can significantly destroy PFAS insitu in groundwater and the sorbed fraction in the aquifer matrix. This in-situ approach would greatly reduce remediation time and eliminate the need for off-site disposal spent GAC or other media.

## Background

In 2015, PFAS, predominantly perfluorooctane sulfonate (PFOS), was discovered in the drinking water wells downgradient from the AFFF fire training area in concentrations greater than the 2016 USEPA Health

# OxyZone®

## Better Technology. Better Results.

OxyZone® is an effective in-ground (in-situ) and above ground (ex-situ) chemical oxidation (ISCO) process to bring contaminated soil and groundwater sites into regulatory compliance and closure faster and with less cost.

The patented OxyZone process developed by EnChem Engineering uses a high-strength, multi-oxidant blend to overcome limitations found in most other environmental remediation treatment methods, resulting in significantly decreased remediation time and clean-up costs.

In addition to being able to destroy emerging contaminants such as perfluorinated compounds (PFCs) and 1,4-dioxane, OxyZone has been applied to remediation of sites containing common organic compounds such as gasoline, fuel oils, and chlorinated organic compounds like tetrachloroethene ("PERC") and mixtures thereof.

## About EnChem Engineering

EnChem Engineering, Inc. possesses the underlying technical environmental remediation expertise and effective remediation processes, facilities and staff to solve the most complex emerging contaminant environmental challenges. We have been a hazardous waste consultant to the U.S. Environmental Protection Agency; the US Air Force and Fortune 500 companies.

## EnChem Engineering Services

- Soil & groundwater remediation
- Hydrogeological site investigations
- Environmental site inspections
- Due diligence, litigation support

Call (617) 795-0058 for a free consultation. Ask for our white papers on environmental remediation with Oxyzone.



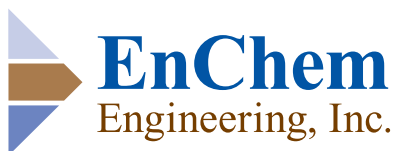
## Benefits of the OxyZone® process

**Versatile** – a comprehensive suite of radicals and oxidants treats a wide range of organic contaminants in soil and groundwater

**Persistent** – OxyZone process achieves a very high oxidation potential immediately upon application and remains effective up to weeks after application

**Easier** – The OxyZone process generates no off-gas or heat making it easier to apply

**Cost Effective** – More complete clean-up in less time results in lower total cost



### EnChem Engineering, Inc.

Advanced Environmental Remediation

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