

Case History

Background

An Industrial site in Old Bethpage, New York requires a robust ground water purification system for the On-Site destruction of **1-4 dioxane & PFAS** contaminants. Ground Water Testing, with funding from the State of New York, was performed to demonstrate **Photo-Cat** destruction capabilities using it's advanced TiO₂ catalyst. This advanced **Photo-Cat** Catalyst was developed to broaden the Photo-Cats capability to destroy a variety of chemicals identified as PFAS. **Photo-Cat** is a chemical free AOP+ and should not be confused with less capable AOP processes such as UV/OX that require process chemicals and are OH^o & UVT dependent.

Photo-Cat Destruction Performance

PFAS MCLs as per USEPA regulatory requirements fall into four different categories as identified the chart below:

| | Category 1 | Category 2 | Category 3 | Hazardous Index |
|-----|----------------------------|---|----------------|-----------------|
| MCL | <4 ppt PFOA <4 ppt PFOS | <10 ppt PFNA <10 ppt PFHxS <10 ppt GenX | <2000 ppt PFBS | <1* |

The Photo-Cat purification results achieved Category 1, 2 & 3 MCLs

| Water Sample Test Results | | |
|---------------------------|-------------|-----------------|
| Contaminant | Feed (ng/L) | Filtrate (ng/L) |
| PFOS | 16 | <1.5 |
| PFOA | 37 | 1.6 |
| PFNA | 26 | <1.5 |
| PFHxS | 7.9 | <1.5 |
| PFPeS | 2.7 | <1.5 |
| PFHpA | 13 | 4.1 |
| PFBS | 3.3 | 3 |
| PFBA | 24 | 27 |
| PFPeA | 21 | 21 |
| PFHxA | 25 | 22 |





Hazardous Index

The Hazardous Index (HI) for the PFAS contaminants present must be **<1**

$$HI = \frac{[PFHxS]}{10 \text{ ng/L}} + \frac{[GenX]}{10 \text{ ng/L}} + \frac{[PFNA]}{10 \text{ ng/L}} + \frac{[PFBS]}{2,000 \text{ ng/L}}$$

Photo-Cat Test results for the PFAS demonstrated regulatory compliance with a Hazardous Index (HI) of **<0.15**

$$<0.15 = \frac{[0]}{10 \text{ ng/L}} + \frac{[0]}{10 \text{ ng/L}} + \frac{[<1.5]^*}{10 \text{ ng/L}} + \frac{[3]}{2,000 \text{ ng/L}}$$

*Below Detection Limit

PFAS Compliance Performance

All MCL categories (1, 2, 3 and HI) are achieved, proving that the Photo-Cat process meets regulatory purification requirements for surface water discharge and drinking water when it comes to PFAS removal.

1-4 dioxane Compliance Performance

1-4 dioxane purification to the required standards was also achieved. This performance has not been detailed in this document as the Photo-Cat process for the destruction of 1,4-dioxane has been in industrial and municipal use for over 25 years in ground and drinking water installations.

Benefits

Photo-Cat technology is the ideal solution for 1,4-dioxane and PFAS destruction in one single unit operation with the following benefits:

- System Complexity Reduction
- Drastically reduced footprint when compared to existing technology
- No liquid / Chemical Waste – No disposal of spent GAC or media
- No Process Chemicals as it is a true Chemical Free Process
- Ease of operation, integrated and fully automated
- NSF/ANSI/CAN 61-372 Compliant





Reference Documents

- Why Photo-Cat
- Photo-Cat Case Histories
- On-site Pilot Verification
- Pilot Verification

Solution

A packaged Photo-Cat system for ground water purification is shown below for compounds such as 1,4-Dioxane, 1,1-DCE, cVOCs and PFAS.

