

Application Methods for RemBind in Soil – Powders, Slurries and Granules

Dr Richard Stewart, Managing Director, RemBind
Sonya Carr, Product Manager, RemBind

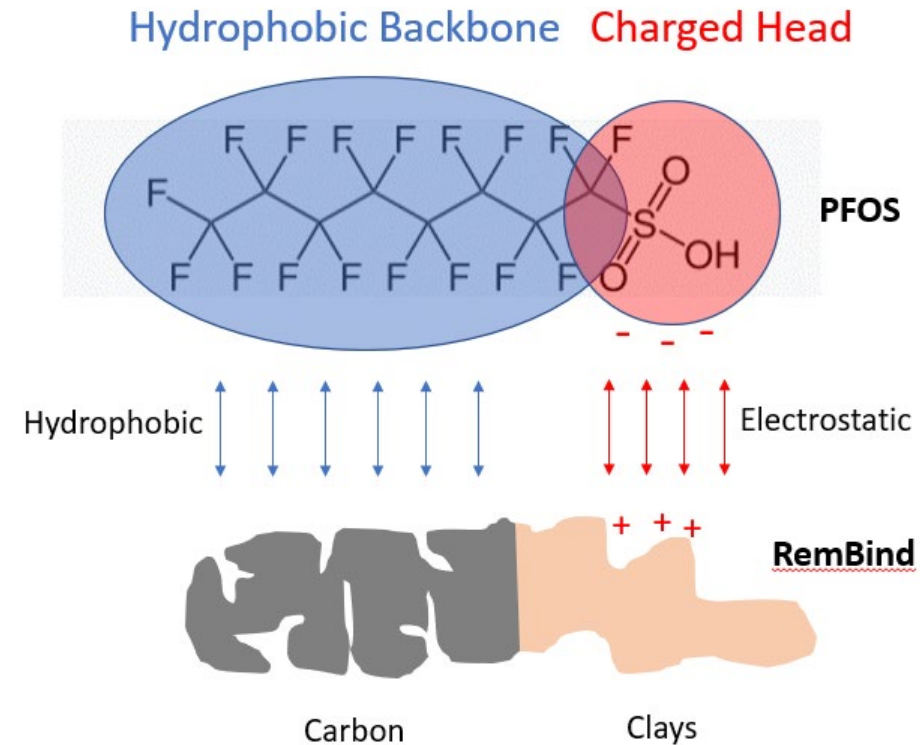


Learning Lab Battelle Chlorinated Conference 03 June 2024



RemBind® Products

- Sorbents for the stabilization of PFAS in soil to prevent leaching into ground water
- Since 2014, we have treated 100,000s tons of soil globally with regulatory sign-off
- Field-ready technology (ITRC 2024)
- Proven long term stability – independently published data using US EPA methods



RemBind® combines the properties of carbons, clays and aluminum hydroxide

Global Project Examples

- Military site, Sweden (full-scale, 2022-23)
- Metal plating site, Sweden (full-scale, 2021-22)
- Fire station, Sweden (full-scale, 2021-22)
- Industrial site, Belgium (pilot 2024)
- Melbourne International Airport, Australia (pilot, 2023)
- Airforce base, Australia (full-scale, 2022)
- Military barracks, Australia (full-scale, 2024)
- Domestic airport site, New Zealand (full-scale, 2024)
- 3 Airforce bases, USA (pilots 2022-23)
- Commercial airport, USA (pilot 2024)



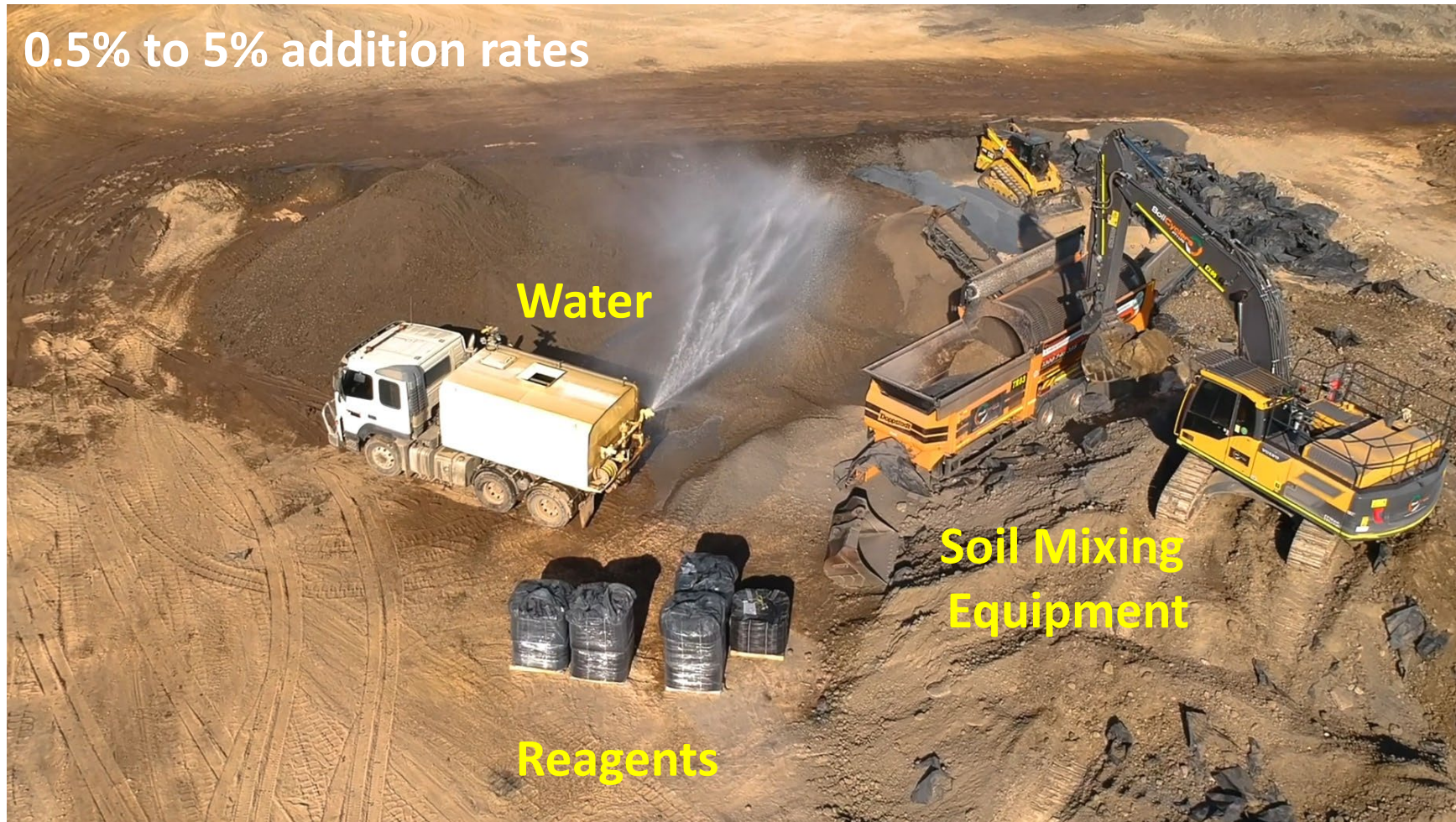
RemBind® in the USA

- Products used in the US since 2016
- Resellers - AquaBlok Ltd
- RemBind USA LLC registered 2023
- Field projects in ND, MA, CO, FL, MI, NJ
- Local stock in Chicago
- Full-scale US manufacturing set up 2024
- US patents and registered trademark



RemBind® super sacks

Field-Scale Application of RemBind®



Examples of Soil Mixing Options for RemBind®



Field Application 1. Powdered Products

- RemBind® 100 is a powdered sorbent
- Our most popular product globally
- Maximum surface area contact with soil – optimal performance
- Control dust with water and suitable machinery (e.g. pneumatic feed)
- Product settles relatively quickly due to the clay content



Field Application 1. Powdered Products - Video



Field Application 2. Liquid Slurry

- The clay content of RemBind® makes it ideal for a liquid slurry
- Benefits include dust-free application and more accurate dosing
- Field scenarios:
 - Agriculture
 - Airports (e.g. airside)
 - Residential or built up areas
 - *In situ* S/S injection & soil mixing



Field Application 2. Liquid Slurry - Video



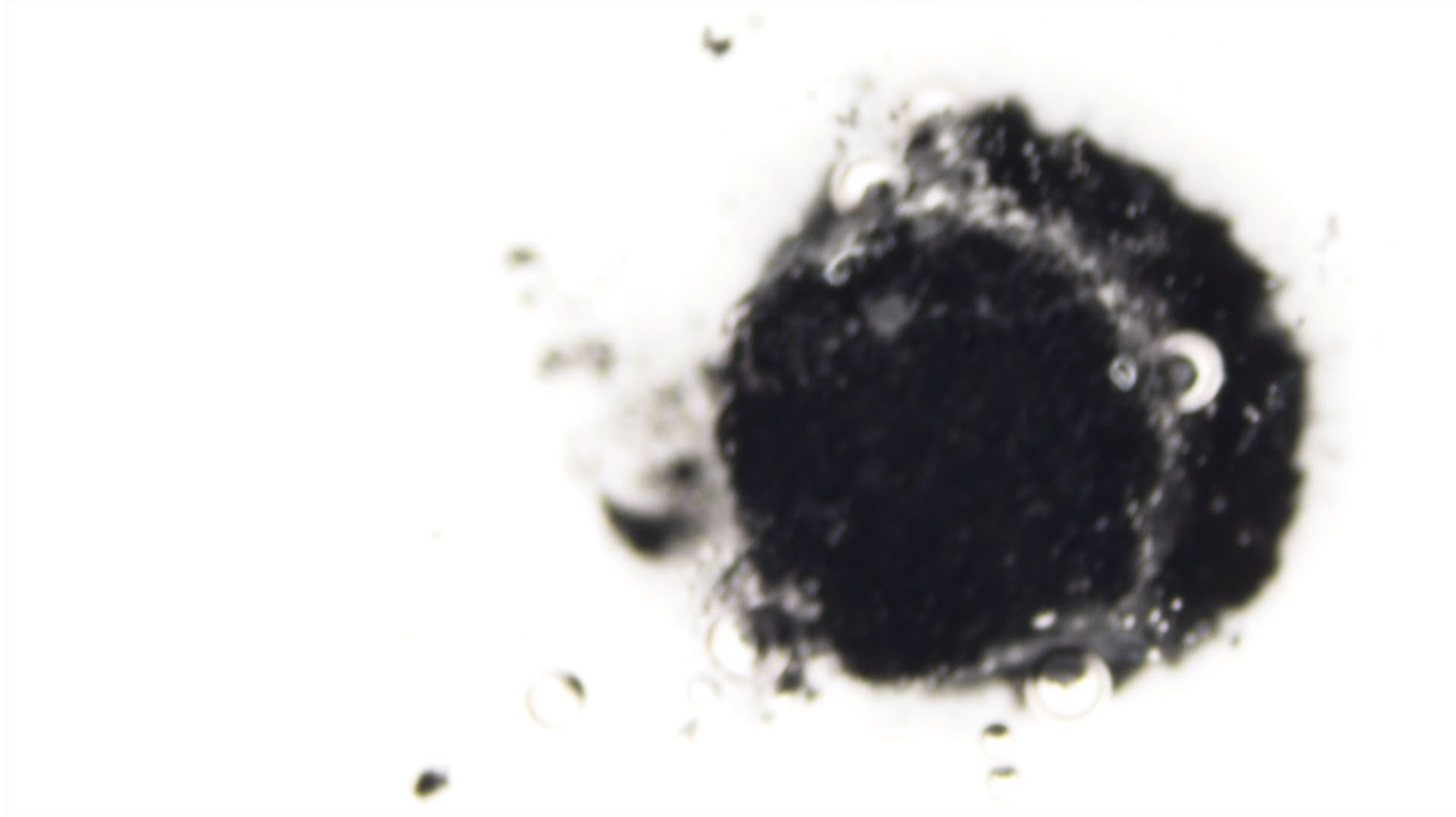
Field Application 3. Granular Product

- RemBind® G Series launching soon
- Handling benefits, easy to apply, dust-free
- Field scenarios:
 - Agriculture & horticulture
 - Restricted access areas (airports)
 - Local areas (sidewalks, gardens)
 - Water treatment?
- **Similar performance to powder** due to patented swelling technology

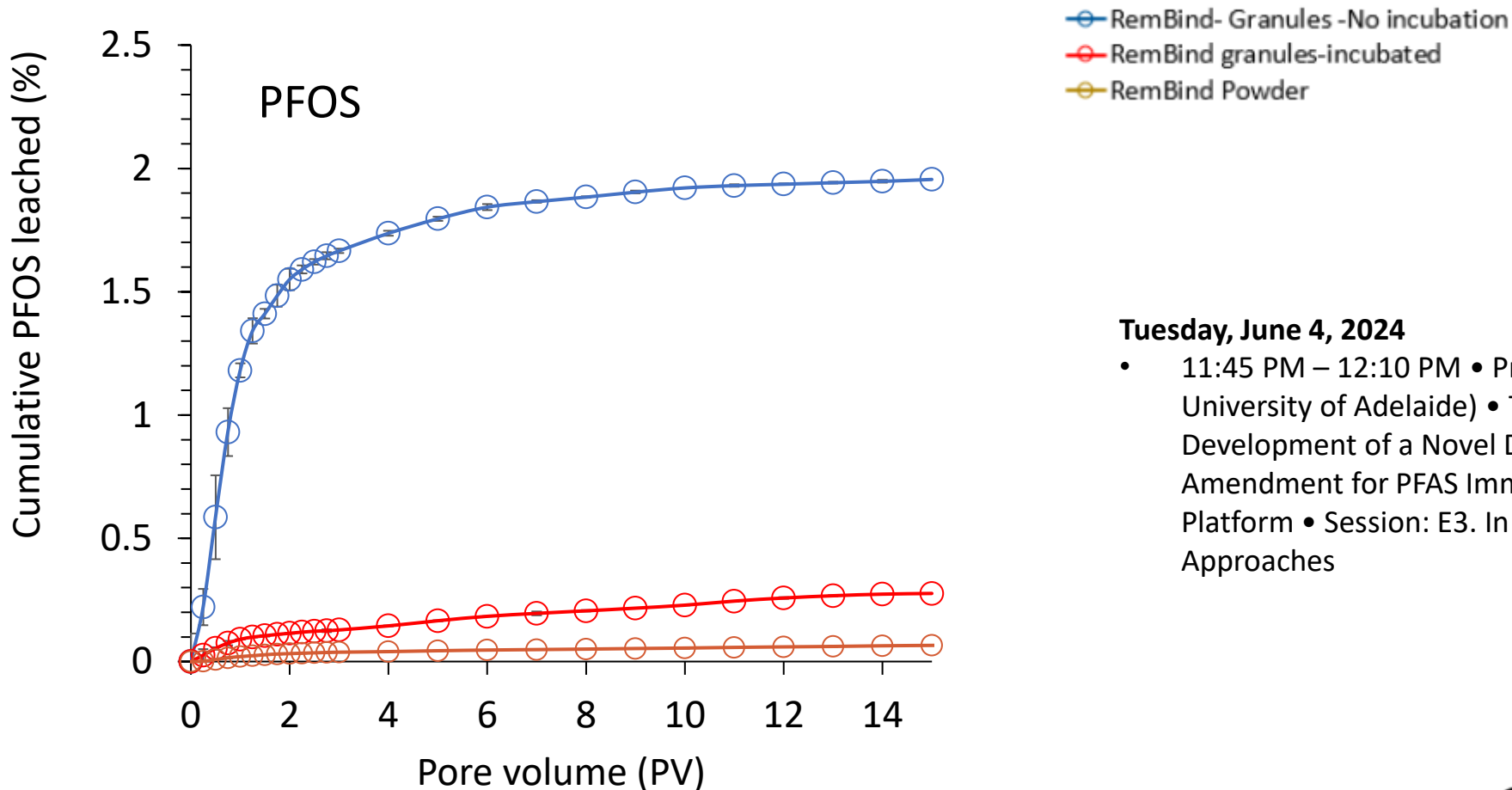


RemBind® Granules

Field Application 3. Granular Product - Video



Field Application 3. Granular Product



Tuesday, June 4, 2024

- 11:45 PM – 12:10 PM • Presenter: Shervin Kabiri (The University of Adelaide) • Title: Formulation and Development of a Novel Dust-Free Carbon-Based Amendment for PFAS Immobilization in Soil • Type: Platform • Session: E3. In Situ PFAS Soil Treatment Approaches

Summary

Product Application	Product Benefits	Field Scenarios
Powdered	<ul style="list-style-type: none">• Low dust - settles relatively quickly due to clay content• Optimal contact with soil	<ul style="list-style-type: none">• Ex-situ stockpile stabilization• In-situ surface stabilization• High soil volumes• Broad range of sites
Liquid Slurry	<ul style="list-style-type: none">• Dust-free• Easily forms slurry due to kaolin component• More accurate dosing	<ul style="list-style-type: none">• Agriculture• Restricted access sites (e.g. airports)• In situ S/S injection & soil mixing
Granular	<ul style="list-style-type: none">• Dust-free• Retains similar performance to a powder	<ul style="list-style-type: none">• Agriculture• Restricted access sites (e.g. airports)• Local areas (e.g. sidewalks, gardens)• Water treatment?

Relevant Presentations at Battelle

Monday, June 3, 2024

- 4:30 PM – 6:30 PM • Presenter: Grant Trigger (Racer Trust) • Title: Remedial Approaches for Management of PFAS-Contaminated Lagoon Sediments and Soils at Buick City Site • Type: Poster • Session: I1. Ex Situ PFAS Water Treatment Technologies

Tuesday, June 4, 2024

- 11:45 PM – 12:10 PM • Presenter: Shervin Kabiri (The University of Adelaide) • Title: Formulation and Development of a Novel Dust-Free Carbon-Based Amendment for PFAS Immobilization in Soil • Type: Platform • Session: E3. In Situ PFAS Soil Treatment Approaches
- 12:10 PM – 12:35 PM • Presenter: Theresa Guillette (Arcadis) • Title: In Situ Stabilization and Solidification for PFAS Remediation in Soils: A Sustainable Solution for Mass Flux Reduction • Type: Platform • Session: E3. In Situ PFAS Soil Treatment Approaches
- 1:00 PM – 1:25 PM • Presenter: Jeffrey Bamer (CDM Smith) • Title: In Situ Soil Stabilization to Mitigate PFAS Transport via Stormwater at an AFFF Source Area • Type: Platform • Session: E3. In Situ PFAS Soil Treatment Approaches

Wednesday, June 5, 2024

- 10:05 AM – 10:30 AM • Presenter: Jurgen Buhl (Cornelsen) • Title: Sorbed PFAS under Weather Conditions: Resilient Enough? • Type: Platform • Session: E4. Ex Situ PFAS Treatment Approaches
- 4:30 PM - 6:30 PM • Presenter: Dr. Matthew Askeland (ADE Consulting) • Title: An Australian Perspective on Managing PFAS in Organics Circular Economies • Type: Poster • Session: I9. Ex-Situ PFAS Treatment: Soils/Solids and Other Waste Streams

Thursday, June 6, 2024

- 1:50 PM – 2:15 PM • Presenter: Daniel Cassidy (Western Michigan University) • Title: Stabilizing PFAS-Contaminated Water, Sediments, and 6,000 yd³ Soil with Six Different Amendments (Buick City, Michigan) • Type: Platform • Session: I9. Ex-Situ PFAS Treatment: Soils/Solids and Other Waste Streams
- 3:30 PM – 3:55 PM • Presenter: Dr. Matthew Askeland (ADE Consulting) • Title: Technologies to Support the Quality Control of PFAS Immobilization and Minimize Uncertainty • Type: Platform • Session: I9. Ex-Situ PFAS Treatment: Soils/Solids and Other Waste Streams

Contact Information



Email: richard.stewart@rembind.com

Website: rembind.com

[Visit our Conference Booth #316](#)