



CHEMISTRY SOLUTIONS TO SUPPORT IN SITU REMEDIATION

CASCADE CHEMISTRIES

OVERVIEW



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Cascade Chemistries provides injectable in situ treatment solutions for complex remediation sites. Amendments are selected and designed based on site conditions, remedial objectives, and performance requirements, with a focus on predictable behavior, persistence, and constructability.

The chemistries offer longer residence times than conventional liquid amendments, supporting treatment of soil-sorbed contaminants and barrier applications. Cascade integrates field experience, treatability testing, and injection design to support effective delivery and performance.

Treatment Capabilities

Cascade Chemistries includes a range of engineered amendments and application strategies, including:

- Colloidal-based persistent, reactive, and sorptive amendments
- Chemistry combinations to address multiple contaminants or remedial phases
- Amendments designed for enhanced subsurface distribution and persistence
- Support for both source area and plume-level treatment objectives

Target Contaminants and Site Conditions

Cascade Chemistries are applied across a wide range of contaminants and subsurface environments, including:

- Chlorinated VOCs, PFAS, metals, and mixed plumes
- Transmissive, heterogeneous, and low-permeability formations

Treatment selection and design account for site geochemistry, hydrogeology, and lithology to improve amendment performance and reduce uncertainty.

Design and Implementation Considerations

Cascade Chemistries supports project teams by considering:

- Design models based on extensive field experience as an injection contractor
- Amendment compatibility with site geochemical conditions
- Integration with remedial design and monitoring objectives
- Injection methods, spacing, and sequencing
- Constructability and field implementation constraints.



ColloidalChem™ and PFAS Barrier

ColloidalChem is the foundation of Cascade Chemistries' in situ treatment approach. Colloidal formulations are designed to improve amendment distribution and performance in complex subsurface conditions, supporting both standalone applications and integrated remedies.

Colloidal carbon barriers for PFAS use colloidal carbon amendments to form permeable sorptive treatment zones that intercept groundwater flow, reduce downgradient PFAS migration, and maintain hydraulic connectivity.

ColloidalChem + Anchor™

Barrier mobility control

Cascade's patented ColloidalChem + Anchor solution is used to control amendment mobility and help maintain barrier stability in the subsurface. This combination supports predictable barrier placement and long term performance in dynamic groundwater conditions.

ColloidalChem + ISCR™

Aggressive solvent source treatment

The combination of ColloidalChem + ISCR supports in situ chemical reduction for aggressive treatment of chlorinated solvent source zones. This approach is used where rapid mass reduction and strong reductive conditions are required.

Colloidal and Sulfidated iZVI

Chemical reduction for solvents

Colloidal and sulfidated injectable zero valent iron (iZVI) formulations are used to chemically reduce chlorinated solvents. These amendments are selected based on site geochemistry, contaminant profile, and performance objectives.

Combined Solvent Remedies

ColloidalChem and iZVI

The combination of ColloidalChem and iZVI allows project teams to pair enhanced delivery with proven reductive and sorptive treatment mechanisms. This approach is used to address complex solvent plumes where distribution, contact, and reaction kinetics are critical to performance.





Pathfinder™ Automated Injection System

Pathfinder is a fully automated injection system developed to improve the distribution and performance of in situ chemistries, including colloidal solids and liquid amendments. Pathfinder removes manual variability from injection operations and delivers amendments in transmissive zones under controlled pressure and flow conditions.

Pathfinder supports:

- Precise control of injection pressure and flow rates
- Simultaneous injection at multiple locations
- Continuous monitoring, data logging, and recording of injection parameters

Pathfinder helps improve amendment contact, reduce operational uncertainty, and support more predictable remediation outcomes by controlling distribution and documenting adherence to design parameters.

Contact Us

If you'd like to discuss chemistry options, combined remedies, or injection and delivery strategies for your site, we're here to help.

Email: communications@cascade-env.com

Request a quote, learn more, or connect with us

<https://www.cascade-env.com/site-remediation/cascade-chemistries/>