

## Customized Metals Treatment Solutions

MetaFix<sup>®</sup> Reagents represent a unique treatment approach for soil, sediment, industrial wastes, and groundwater contaminated with heavy metals. MetaFix<sup>®</sup> reagents are customized to cost effectively address even the most challenging site conditions.

MetaFix<sup>®</sup> reagents are formulated blends of reducing agents, reactive minerals, mineral activators, catalysts, and pH modifiers. Following placement of MetaFix<sup>®</sup> reagent into the treatment zone, a number of physical and chemical processes combine to create geochemical conditions under which common heavy metals are subjected to reduction, adsorption, precipitation, and conversion to stable sulfide and iron-sulfide precipitates. These heavy metal sulfide precipitates have greater stability than metal hydroxide precipitates which are formed with traditional metals treatment approaches based on pH adjustment.

Moreover, since MetaFix<sup>®</sup> utilizes multiple mechanisms, it allows for robust performance in challenging environments, with high metals concentrations, high concentrations of organic contaminants such as solvents, high salt content, or extreme pH levels.

A custom MetaFix<sup>®</sup> blend is developed based on a site's specific conditions through a low-cost treatability study to address soil and/or groundwater impacts.

### MetaFix<sup>®</sup> Benefits

The MetaFix<sup>®</sup> approach offers a truly one of a kind, proprietary, customized solution for the most challenging metals sites.

- The proven ability to address multiple heavy metals including; Al, As, Cd, Cu, Cr, Hg, Ni, Pb, Se, V, and Zn
- Superior Cr(VI) treatment with the formation of more stable mixed (Cr, Fe) hydroxides
- The capability of treating comingled plumes of heavy metals and chlorinated solvents
- Low overall treatment costs based on lower reagent dosing rates, as low as 0.1%-4% (wt/wt), versus other metals treatment technologies
- The treatment mechanism is not dependent on alkalinity for removal of metals, therefore not susceptible to rebound when the matrix pH returns to ambient levels



### Application Methods

- Direct push injection
- Hydraulic and pneumatic fracturing
- Direct soil mixing
- Permeable Reactive Barriers

*For more information and detailed case studies, please visit our website.*