



## Treatability Study – MetaFix® Reagent Applied to Heavily Contaminated Soils for the Stabilization of Chromium (VI)

### Overview

Reconstruction of a former chromate chemical manufacturing plant occurred on top of a vast amount of chromium (Cr) slag, a byproduct of the manufacturing process, and resulted in severe chromium contamination to the shallow and deep soil in most of the area.

The extent of contamination is summarized in Table 1, with a total volume of contaminated soil of approximately 2,500,000 m<sup>3</sup>. Remediation is required before the site can be redeveloped for commercial and residential use.

The total chromium concentration in the soil sample used in treatability was as high as 11,300 mg/kg with Cr (VI) concentrations of approximately 3,000 mg/kg, representing the most contaminated area at this site. The remedial goal is set as 35 g/kg of hexavalent chromium (Cr (VI)) in soil by standard alkaline digestion.



Figure 1: Location of a former chromate chemical production site in China

### Treatability Study

A lab treatability study was conducted to determine the optimal MetaFix® Reagent formulation and dosing rate to treat the highly contaminated soil samples.

MetaFix reagents at a dose of 3% and 4% (wt/wt) were evaluated after a 7 day reaction period with the contaminated soil samples. As shown in Figure 2, a MetaFix reagent dose as low as 3% (wt/wt) achieved a decrease in Cr (VI) concentrations over the control by three orders of magnitude, an order

Cr (VI) Concentrations (mg/kg)	Volume (10 <sup>3</sup> m <sup>3</sup> )
Low (35-200)	1,300
Medium (200-1000)	1,200
High (>1000)	20

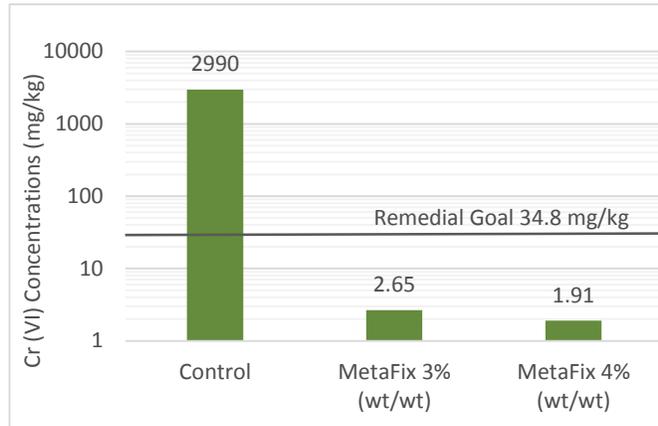
Table 1: Extent of Cr (VI) contamination at the site by treatment volume



of magnitude lower than the remedial goal. A lower dosage rate may be evaluated in the pilot application to determine if it would also meet the remedial goal.

### **Summary**

MetaFix demonstrated excellent stabilization effectiveness for Cr (VI). A 3% dosage rate exceeded the remedial goal at this highly contaminated site with approximately 3000 mg/kg Cr (VI). MetaFix offers a very competitive solution to these heavily contaminated chromium sites, based on its low dosage rates, environmentally friendly components, and stabilization effect under natural subsurface conditions.



**Figure 2:** Cr(VI) stabilization of soils with MetaFix Reagent

Information courtesy of Beijing Enviro-Chem, a PeroxyChem joint venture in China.

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