INTRODUCTION
A full scale implementation of in situ soil blending was completed during the summer of 2015. Redox Tech's proprietary soil blending equipment was used to treat clay that was impacted with trichloroethene (TCE) and a daughter product, dichloroethene (DCE), at a former industrial site. In situ soil blending was selected over soil stabilization or dig and haul because it was less expensive and provides permanent treatment.

BACKGROUND
Past solvent management practices at the site resulted in soil and groundwater impacts with TCE and DCE. The soil is glacial till with interbedded sand layers. Soil vapor extraction had been utilized to treat the soil, but it did not completely eliminate the source area. Dig and haul had also been used to remove a small portion of the impacted soil. The impacted soil was limited to two areas. One was inside the footprint of the building and the other was along the edge of the building, and was both inside and outside. The impacted soil was between two feet and 25 feet below surface and the extent of impacted soil was above 750 parts per billion (ppb) TCE. The mass of soil for treatment in the respective areas was 420 and 16,250 tons of soil. RemOx® S ISCO reagent (potassium permanganate) was selected to treat the target contaminants in the soil.

APPLICATIONS
A total of 167,800 pounds of RemOx S was used to treat the soil. The RemOx S dose was five grams per kg on average. Most of the soil was treated at five g/kg, but the RemOx S dose was varied for some cells to account for variation in contaminant levels. RemOx S was added to the soil in solid form and makeup water was used to dissolve the RemOx S in place. Blending the entire volume required 49 days in the field, which included site preparation and returning clean soil back to the area. The average amount of soil blended per day was 340 tons of soil. Figures 1 and 2 are photos taken during the blending process. The blending was completed until a uniform purple color was achieved within the cell.

Figure 1. Shallow Soil Blending

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RESULTS

Soil sampling was completed by collecting soil samples with an excavator bucket within the cell. At least one confirmatory sample was collected in each cell and at varying depths. Baseline concentrations were above 750 ppb TCE. All samples showed non-detectable levels after treatment. Soil blending with RemOx® SISCO reagent allowed for complete destruction of the contaminants of concern, TCE and DCE.