

TABLE 2

List of Sampling Analytes and Monitoring Parameters

In Situ Chemical Oxidation Treatability Study Work Plan, Davis Global Communications Site

Parameter	Method	Sample Container, Volume, and Preservative	Reason for Monitoring
Water Level	Field measurement	Not applicable	Measure hydraulic response to injection and may be used to infer flow directions.
Conductivity	Field measurement	Not applicable	Measures the ability of a solution to conduct an electrical current. Provides an indirect measurement of the concentration of dissolved ions in solution.
Temperature	Field measurement	Not applicable	Increased temperature indicates occurrence of oxidation reactions; however, temperature should not rise significantly.
Oxygen Reduction Potential (ORP)	Field measurement	Not applicable	Permanganate is an oxidizer and will increase the redox potential. Provides useful first indication of effect of injection prior to arrival of permanganate.
pH	Field measurement	Not applicable	The optimum pH for the desired reaction is near neutral; however, reactions will continue to take place between pH 3 and pH 12.
Permanganate	Colorimetric Ag Sol SOP v1.3		A direct measurement of oxidant permanganate indicating longevity of treatment and in situ reaction rates.
Dissolved Metals (specifically total chromium, manganese, cadmium, lead, mercury, nickel, and silver)	EPA Method 6010B	500-ml polyethylene bottle, Nitric acid to pH < 2	The oxidation state of metals may be increased or metals may be released by oxidation of metal complexes as a result of oxidant addition to the subsurface, which may lead to metal mobility. Metals mobilization and attenuation may influence the applicability of permanganate treatment for soil and groundwater treatment. Manganese is a direct product of permanganate reaction but tends to precipitate, thus measurement is necessary. CAM-17 metals were evaluated during the bench-scale test and the metals that were elevated at the completion of the bench-test were retained for field monitoring, thus measurement is necessary.
Hexavalent Chromium	EPA Method 7199	500 ml polyethylene or glass bottle	Likely to be generated by oxidation of the aquifer materials. While permanganate is present, all chromium will be in hexavalent state. Analysis cannot be performed on neutralized samples.
VOCs	EPA Method 8260B	40 ml VOA, Hydrochloric acid to pH < 2	The COCs. A decrease in concentration (after taking into account dilution) will provide a direct indication that the oxidation reactions are being effective.
Sulfate	EPA Method 300.1	500 ml polyethylene bottle	An indirect measurement of thiosulfate which is a reactive form of sulfate. Sulfate will be analyzed if sodium thiosulfate is injected during implementation of the contingency plan.
Total Dissolved Solids	EPA Method 160.2	500 ml polyethylene bottle	A bulk measure of groundwater cations that is often influenced by the injection of K ⁺ or Na ⁺ along with permanganate.

