

Specialized Testing for Bioremediation Performance Monitoring



Contact SiREM for more information on bioremediation performance monitoring services.

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At SiREM, your success is our success. We strive to provide the best customer service in the industry and offer specialized analytical testing to support your remediation projects. SiREM's specialized performance monitoring tests are used in conjunction with routine analytical tests (e.x., CVOCs) and field parameters (e.x., pH, DO and ORP), and increase your ability to verify remediation success, optimize performance and detect upset conditions. Performance monitoring testing option offered by SiREM include;

- **Gene-Trac®** tests are used to monitor the growth and distribution of key functioning microorganisms *in-situ*.
 - Targeted qPCR tests to quantify key microbes and functional genes; and
 - Next Generation Sequencing (NGS) to characterize microbial community function and dynamics.
*Storage/preservation: 4-10°C, Hold time: 7 days, TAT: 10 days (qPCR) & 8-10 weeks (NGS)
- **Dissolved hydrocarbon gases** (DHG) includes methane, ethane, and ethene. Ethene and ethane are the major non-toxic daughter product of many chlorinated solvents. Methane production is an indicator of highly reducing conditions compatible with reductive dechlorination.
*Storage/preservation: 4-10°C/HCl, Hold Time: 28 days, TAT: 10 days
- **Anions** (e.g., nitrate, sulfate, chloride, bromide) to monitor key redox species for confirmation of, the onset of suitable reducing conditions, or competing electron acceptors and to determine groundwater velocity and flow path using stable anionic tracers. Increasing chloride concentration can be an indicator of reductive dechlorination.
*Storage/preservation: 4-10°C, Hold Time: 10 days, TAT: 10 days
- **Volatile fatty analysis** (VFA) to confirm fermentation of electron donors (i.e., emulsified vegetable oils or lactate) and determine if additional electron donor is required.
*Storage/preservation: 4-10°C, Hold Time: 10 days, TAT: 10 days
- **Compound Specific Isotope Analysis** (CSIA) to evaluate the extent of contaminant degradation versus non-degradative losses and to differentiate between biotic and abiotic degradation pathways. Offered in North America through a strategic partnership with Isodetect.
*Storage/preservation: 4-10°C/NaOH, Hold Time: 6-8 weeks, TAT: 6-8 weeks

Specialized analytical testing provides valuable information for monitoring, managing and optimizing bioremediation systems to make data driven decisions for:

- Determining biodegradation potential of indigenous microbial populations and the need for and effectiveness of bioaugmentation (Gene-Trac);
- Successful introduction and growth of bioaugmentation cultures;
- Determining if the appropriate redox conditions are present to support bioaugmentation (DHG and Anions);
- Determining if complete degradation is occurring (i.e., ethene production) (DHG);
- Electron donor distribution and utilization (VFA);
- Confirming extent of contaminant biodegradation versus non-degradative losses and differentiating abiotic and biotic degradation pathways (CSIA).