

AEROBIC NATURAL ATTENUATION STUDY

Typical contaminants: TPH (gas, diesel, motor oil, etc., BTEX, MTBE, vinyl chloride)

Biological Analysis

<u>Description</u>	<u>EPA Method</u>	<u>Matrix</u>	<u>Bottle</u>	<u>Preservative</u>
Specific Degraders: Aerobic petroleum hydrocarbon-degrading bacteria	9215A (HPC)/ SM9215B modified	aqueous	1 pt HDPE plastic	None
Total Heterotrophic bacteria	9215A (HPC)/ SM9215B modified	aqueous	1 pt HDPE plastic	None

Chemical Analysis

<u>Description</u>	<u>Method</u>	<u>Matrix</u>	<u>Bottle</u>	<u>Preservative</u>
Biological oxygen demand (BOD: 5-day)	SM 5210B	aqueous	1 L (or 1/2 gal.) HDPE plastic	None
Alkalinity: Speciated	SM 2320B	aqueous	1 L (or 1/2 gal.) HDPE plastic	None
Total Alkalinity as CaCO ₃	SM 2320B	aqueous	1 L (or 1/2 gal.) HDPE plastic	None
Carbonate Alkalinity as CaCO ₃	SM 2320B	aqueous	1 L (or 1/2 gal.) HDPE plastic	None
Bicarbonate Alkalinity as CaCO ₃	SM 2320B	aqueous	1 L (or 1/2 gal.) HDPE plastic	None
Hydroxide Alkalinity as CaCO ₃	SM 2320B	aqueous	1 L (or 1/2 gal.) HDPE plastic	None
Ortho-phosphate	EPA 300.0	aqueous	1 L (or 1/2 gal.) HDPE plastic	None
Nitrate as NO ₃	EPA 300.0	aqueous	1 L (or 1/2 gal.) HDPE plastic	None
Sulfate as SO ₄	EPA 300.0	aqueous	1 L (or 1/2 gal.) HDPE plastic	None
Total Dissolved Solids (TDS)	EPA 160.1	aqueous	1 L (or 1/2 gal.) HDPE plastic	None
Ammonia as nitrogen	SM 4500NH3C	aqueous	1 L (or 1/2 gal.) HDPE plastic	H ₂ SO ₄
Total Organic Carbon (TOC)	EPA 415.1	aqueous	125 ml amber glass	HCl
Total Inorganic Carbon (TIC)	EPA 415.1	aqueous	125 ml amber glass	HCl
Chemical Oxygen Demand (COD)	SM 5220D	aqueous	1 pt. HDPE plastic	H ₂ SO ₄

Field Measurements

<u>Description</u>	<u>Method</u>	<u>Matrix</u>	<u>Bottle</u>	<u>Preservative</u>
Dissolved Oxygen (DO)	Point Four downhole DO Meter	aqueous	1 pt. HDPE plastic	None
Oxidation-Reduction Potential (ORP)	Point Four downhole ORP Meter	aqueous	1 pt. HDPE plastic	None
pH	Field Meter	aqueous	1 pt. HDPE plastic	None
Temperature	Field Meter	aqueous	1 pt. HDPE plastic	None
Total iron	colorimetric	aqueous	1 pt. HDPE plastic	None
Fe+2 (Ferrous iron = reduced)	colorimetric	aqueous	1 pt. HDPE plastic	None
Fe+3 (Ferric iron = oxidized) by calc.	calculation	NA	NA	NA
Dissolved Carbon Dioxide (CO ₂) by calc.	calculation	NA	NA	NA

NOTES:

Most laboratory analyses on 10 day turn around time
 SM = standard method
 NA = not applicable
 For EBS projects, EBS supplies free bottles and shipping with an order of 3 or more well samples.

ANAEROBIC NATURAL ATTENUATION STUDY: solvents, perchlorate, heavy metals, nitrate

All the same analyses, except solvent specific degraders is not performed.
 Solvent specific bench tests are available: 4-6 weeks in duration