

Isotope Forensic Analyses

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These analyses can be combined into a package of tests that will answer most forensic questions. We encourage you to contact our experts, who can help select the optimal package for your project. They can also help structure the sampling program and provide pricing for the analytical package. Interpretive reports can be prepared that will characterize the plumes and provide a rigorous scientific rationale for the forensic conclusions.

Targets	Isotope Forensic Analysis
Organics (CSIA) CVOCs CVOCs CVOCs MTBE BTEX Alkanes PAHs	<ul style="list-style-type: none"> • Contaminant Concentrations in water or soil samples by EPA Method 8260B* • Compound Specific Isotope Analysis (CSIA) on GC-Isotope Ratio Mass Spectrometry (GC-IRMS) • $^{13}\text{C}/^{12}\text{C}$ ratio of dissolved or product chlorinated solvents by 1D-CSIA • $^{13}\text{C}/^{12}\text{C}$ and $^{37}\text{Cl}/^{35}\text{Cl}$ (by GC/MS) ratios of dissolved or product chlorinated solvents by 2D-CSIA • $^{13}\text{C}/^{12}\text{C}$, $^{37}\text{Cl}/^{35}\text{Cl}$ and $^2\text{H}/^1\text{H}$ ratios of dissolved or product chlorinated solvents by 3D-CSIA • $^{13}\text{C}/^{12}\text{C}$ and $^2\text{H}/^1\text{H}$ ratios of dissolved or product MTBE by 2D-CSIA • $^{13}\text{C}/^{12}\text{C}$ and $^2\text{H}/^1\text{H}$ ratios of dissolved or product BTEX by 2D-CSIA • $^{13}\text{C}/^{12}\text{C}$ and $^2\text{H}/^1\text{H}$ ratios of dissolved or product Alkanes by 2D-CSIA • $^{13}\text{C}/^{12}\text{C}$ and $^2\text{H}/^1\text{H}$ ratios of dissolved or product PAHs by 2D-CSIA
Fugitive Gas Methane Hydrocarbon Gas Hydrocarbon Gas Methane	<ul style="list-style-type: none"> • Fixed gas and hydrocarbon concentrations in gas or water samples by GC/TCD and GC/FID • Two Dimensional-Compound Specific Isotope Analysis (2D-CSIA) on GC-IRMS • $^{13}\text{C}/^{12}\text{C}$ ratios of C1, CO₂, C2, C3, i-C4, n-C4, i-C5, and n-C5 by 1D-CSIA • $^{13}\text{C}/^{12}\text{C}$ and $^2\text{H}/^1\text{H}$ ratios of C1, C2, C3, i-C4, n-C4, i-C5, and n-C5 by 2D-CSIA • Age-dating of fugitive methane for C-14 (pMC) by Accelerator Mass Spectrometry (AMS)*
Organics (Bulk SIA)	<ul style="list-style-type: none"> • Bulk Stable Isotope Analysis on Elemental Analyzer-Isotope Ratio Mass Spectrometry (EA-IRMS) • $^{13}\text{C}/^{12}\text{C}$ ratio of crude, fuel, kerogen, tree-ring samples, etc. by EA-IRMS • $^2\text{H}/^1\text{H}$ ratios of crude, fuel, kerogen, tree-ring samples, etc. by EA-IRMS • $^{34}\text{S}/^{32}\text{S}$ ratio of crude, fuel, kerogen, tree-ring samples, etc. by EA-IRMS • $^{15}\text{N}/^{14}\text{N}$ ratio of crude, fuel, kerogen, tree-ring samples, etc. by EA-IRMS
Inorganics (as water) Nitrate Ammonium Sulfate DIC DIC	<ul style="list-style-type: none"> • Water $^2\text{H}/^1\text{H}$ and $^{18}\text{O}/^{16}\text{O}$ ratios by Cavity Ring-Down Spectroscopy (CRDS) or EA-IRMS • Age-dating of water for ^3H (Tritium) via electrolytic enrichment process by Beta Spectrometry • $^{15}\text{N}/^{14}\text{N}$ and $^{18}\text{O}/^{16}\text{O}$ ratios of dissolved nitrate by GC-IRMS using Denitrifier Method • $^{15}\text{N}/^{14}\text{N}$ ratio of dissolved ammonium by Diffusion EA-IRMS • $^{34}\text{S}/^{32}\text{S}$ and $^{18}\text{O}/^{16}\text{O}$ ratios of dissolved sulfate by EA-IRMS • $^{13}\text{C}/^{12}\text{C}$ and/or $^{18}\text{O}/^{16}\text{O}$ ratios of dissolved inorganic carbonate by EA-IRMS • ^{14}C age-dating of dissolved inorganic carbonate by AMS*
Inorganics (as solid)	<ul style="list-style-type: none"> • $^{13}\text{C}/^{12}\text{C}$ and/or $^{18}\text{O}/^{16}\text{O}$ ratios of purified solid carbonate by EA-IRMS • $^{34}\text{S}/^{32}\text{S}$ and $^{18}\text{O}/^{16}\text{O}$ ratios of purified solid sulfate by EA-IRMS • $^{15}\text{N}/^{14}\text{N}$ and $^{18}\text{O}/^{16}\text{O}$ ratios of purified solid nitrate by GC-IRMS using Denitrifier Method
Other	<ul style="list-style-type: none"> • Other isotope analyses such as Sr/Cr/Cl etc...are available by special request*

*Subcontracted