

**The Ethanol, Other Fuel Blending Components & Additives:  
From Characterization through Remediation  
Classroom Training - Day One**

<u>Module</u>	<u>Topic</u>
	Registration
1	Welcome and Introduction
2	History of Ethanol, MTBE & Other Major Fuel Blending Agents & Additives - History of Tetra Ethyl Lead and Lead Scavengers - History of Ethanol & Other Fuel Oxygenates
3	Composition Gasoline through time: U.S. Gasoline Composition Study
4	Physical properties of, sampling for and Analytical Methods for Ethanol, MTBE & Other Major Fuel Blending Agents & Additives
	(Break)
5	Sources and Releases
6	Technology Selection / Application Considerations
7	Site Conceptual Models
8	Site Characterization / Assessment I - Source Zone and Plume Conceptual Scenarios
9	Plume Formation, Transport & Modeling
10	Computer Tools & Online Calculators
11	Biodegradation

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<u>Module</u>	<u>Topic</u>
12	Site Characterization/ Assessment II - Site Characterization Issues
13	ESC vs CSA Case Study
	Performance Monitoring
15	Remedial Technologies Groundwater Extraction - P&T Data & Design Considerations
16	Smart Pump & Treat (Case Study)
17 18 19	Ex-situ Remedial Technologies / Ex-situ Treatment - Aeration - Sorption - Advanced Oxidation
20	Ex-Situ Bioremediation
21	Ex-Situ Treatment Technology Comparative Case Study: BioGAC / HiPox
22	Fluidized bed bio-reactor case studies
23	In-Situ Bioremediation - Aerobic - Bioaugmentation - Co-substrate Addition - Oxygen-only Addition - Anaerobic
24	Enhanced In-Situ Bioremediation Case Studies - Oxygen Bio Barrier - HRC Barrier
25	Monitored Natural Attenuation - MNA Case Study

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<u>Module</u>	<u>Topic</u>
26	Air Sparging
27	Air Sparging Case Studies
28	In-Situ Chemical Oxidation (ISCO)
29	ISCO Case Study
30	Phytoremediation
31	PRACTICAL APPLICATION Session 1
31	PRACTICAL APPLICATION Session 2
32	PRACTICAL APPLICATION Session 3
33	PRACTICAL APPLICATION Session 4
34	Practical Application Rap-Up - Actual Remedial Scenario