Matrix of Government Sponsored Small Business Research Projects Addressing 21M^2 Needs

Department of Energy	Department of Defense	Environmental Protection Agency	National Science Foundation
In Situ Sensors for Monitoring Ground-Water Contamination/Treatment System Performance			
A Multifunctional Fiber Optic Sensor for Cone Pentrometer Applications (Phase 1). Wei Qiu, 310-320-3088	An Advanced SERS Water Monitor for Chemical and Biological Analytes (Phase 1). Kevin M. Spencer, 781-769-9450	Miniature Membrane Inlet Gas Chromatograph for Cone Penetrometers (Phase 1). Michael Dvorak, 701-237-4908	Sol-Gel Processed Thin-Film Nitrogen Oxides Sensors. Ayyasamy Aruchamy, 520-546-6944, amsen@azstarnet.com
Development of a Fiber-Optic Sensor for Nitrate Detection (Phase 1). Eugene Watson, 307-755-6490	Attenuated Total Reflectance (ATR) Sensor (Phase 2). Yi Tang, 609-716-1605	Real-Time Analytical Technology for Environmental Applications (Phase 1). Bijan Miremadi, 303-702-1672	A Novel Array-Based Chemical Sensor (Phase 2). Anuncia Gonzalez-Martin lynntech@myriad.net
Fiber Optic Sensor for Industrial Process Measurement and Control (Phase 1). Jeffrey Segall, 949-553-0688	E-SMART Enabled Sensor Development (Phase 2). Brian Strecker, 405-372-9535	Miniaturized Electrochemical Sensor for Cr(VI) in Groundwater and Surface Water (Phase 1). Veronica M. Cepak, 303-530-0263, ext. 111	Cavity Ringdown Evanescent Wave Fiber Optic Sensor (Phase 2). Anthony O'Keefe, 415-965-7772
Hand-Held Monitor for On-Site Detection of Heavy Metals in Water Using Microfabricated Detector Chips (Phase 2). Michael T. Carter, 303-440-8008	Underwater Sampling Inlet/ Preconcentrator System for In Situ Chemical Measurements of UXO Contaminants in Seawater from AUVs (Phase 1). Paul M. Holland, 805-692-4978	Portable Fast GC System for Field Environmental Monitoring and Measurement Problems (Phase 1). Mark A. Klemp, 734-662-3410	Continuous On-Line Monitor to Detect and Quantify Inorganic Contaminants in Water. Anthony O'Keefe, 415-965-7772
New Optical Coupling of Infrared Analyzers to Industrial Processes (Phase 1). James R. Markham, 860-528-9806	Autonomous Solid Phase Microextraction for Explosives Detection and Identification (Phase 1). Job Bello, 781-769-9450	A Portable Biosensor for the Monitoring of Pentachlorophenol in Pump and Treat Water (Phase 1). John Bowen, 307-761-3815	Continuous On-line Monitor to Detect and Quantify Organic Contaminants in Water (Phase 1). H. Wallace Schauer, brimsness@ceemaine.org

Sensor for Real-Time Analysis of Heavy Metals and Radionuclides in Groundwater (Phase 1). Real-Time Analyzers (no contact person)	A Compact Submersible Trace Chemical Analyzer for Tracking Plumes of Chemical Explosives with Autonomous Underwater Vehicles (Phase 1). Alfred Hanson, 401-874-6294	Rapid, Accurate, Single-Step Test Strip for Low Level of Arsenic in Water (Phase 1). John A. Bognar, 303-792-5615	Fiber Optic Affinity Ligand Sensor for Quantification of Petroleum and Bioremediation (Phase 2). Mark E Jones, jonesm@lunainnovations.com
A Novel Electrochemical Detection Strategy for Heavy Metal Monitoring (Phase 1). Eltron Research, Inc. (no contact person)	Laser Induced Plasma Fluorescence Spectroscopy Detection of Heavy Metals (Phase 2). Brian J. Sullivan, 760-438-1010		Integrated Water Quality Monitoring System (Phase 2). Sean M. Christian, 540-864-7821, schristian@airak.com
Intelligent Unmanned Monitoring of Remediated Sites (Phase 1). Emile Fiesler (no phone)	A Novel Sensor for CW Agent Detection (Phase 2). Erik Handy, 978-250-4200		A New Device for Quantitative Determination of Trace Gas Species (Phase 1). Wen-Bin Yan, 215-343-6600, wbyan@meeco.com
Intelligent Unmanned Monitoring of Remediated Sites (Phase 2). Emile Fiesler (no phone)			
Handheld Chemical Analysis System for Field Use (Phase 1). Brian Strecker, 405-372-9535			
Development of a Fiber-Optic Dissolved Oxygen Sensor for Continuous Monitoring of Groundwater (Phase 1). Ping Wu, 937-767-7241			
Long-Term Electrochemical Measurement of Hazardous Metals in Groundwater (Phase 1). Stephen H. Hall, 509-582-8057			

Continuous Emissions Monitors for Use with Thermal Hazardous Waste Treatment Systems			
Eliminating Particle-Related Artifacts in the Real-Time Measurement of Mercury in Flue Gases (Phase 1). Daryl L. Roberts, 612-379-3963	Minimally-Intrusive Real-Time Temperature and Composition Sensor for Combustor Applications (Phase 1). Neil Goldstein, 781-273-4770	Interferometric Continuous Emission Monitor for Active Control of Organic Emissions (Phase 1). Arthur T. Poulos, 609-259-0501	Combustible Gas Microsensor from Self-Organized Nanoporous Ceramic (Phase 1). Dmitri Routkevitch, staff@nrcorp.com
High Temperature Micromachined Sensor for Industrial Gas Streams (Phase 1). Dmitri Routkevich, 303-702-1672	Compact DIAL System for Chemical Vapor Sensing (Phase 2). Christopher M. Gittins, 978-689-0003	Optical Monitor for Noninvasive, Chemical- and Size-Differentiated Characterization of Airborne Aerosols (Phase 1). Harry C. Lord III, 626-813-1460	
Real-time Gas Composition Analyzers for On-Line Process Control (Phase 1). Chuanjing Xu, 303-702-1672		Handheld Laser-Based Sensor for Remote Detection of Gas Leaks (Phase 2). Michael B. Frish, 978-689-0003	
Robust Micromachined Silicon Carbide Environmental Sensors (Phase 2). Richard Mlcak, 617-661-6075			
SEM/MIRS Characterization of Nitrogenated Particulate Matter (Phase 1). Gary S. Casuccio, 724-387-1818			
Intelligent Unmanned Monitoring of Remediated Sites (Phase 1). Emile Fiesler (no phone)			
Intelligent Unmanned Monitoring of Remediated Sites (Phase 2). Emile Fiesler (no phone)			
Remote Sensing for Fence-Line Monitoring for Fugitive Emissions/Enforcement Activities			

A Hand Held Instrument Using an Array-Based Sensor for the Detection of Signatures of Weapons of Mass Destruction (Phase 1). Anuncia Gonzalez-Martin, 409-693-0017	A Chemical Sniffer to Detect Nuclear Weapons (Phase 1). Kevin M. Spencer, 781-769-9450	Chemiresistor Microsensors for Environmental Monitoring Systems (Phase 1). Ross C. Thomas, 303-440-8008	A New Device for Quantitative Determination of Trace Gas Species (Phase 1). Wen-Bin Yan, wbyan@meeco.com
Autofocusing Catadioptric Telescope for Lidar Applications (Phase 1). Lucy Wender, 847-566-2528	A Small, Light Weight, Low Power, Low Cost, FT-IR Spectrometer (Phase 2). Peter R. Soloman (no phone)	Environmental Monitoring Compact Raman LIDAR System Utilizing APD Array Detectors (Phase 1). Arieh Karger, 617-926-1167	Cavity Ringdown Evanescent Wave Fiber Optic Sensor (Phase 2). Anthony O'Keefe, 415-965-7772
Development of a Smart Air Sampler System (Phase 2). Eric W. Saaski, 425-486-7831	Adaptable Platforms for Application Specific Chemometric Spectroscopy (Phase 1). Dennis Reust, 405-372-9535	Handheld Laser-Based Sensor for Remote Detection of Gas Leaks (Phase 1). Michael B. Frish, 978-689-0003	Enhanced Phase Sensitive Spectroscopy Using Matched Gratings (Phase 2). Rand Swanson, 406-522-0388
Effluent Plume Chemical Analysis Algorithms Using Hyperspectral and Ultraspectral Data (Phase 1). R. David Dikeman, 619-455-5530	Compact, Eyesafe, Multi-Function Coherent Lidar for Discrimination of Biological Agents (Phase 1). Timothy J. Carrig, 303-604-2000	Interferometric Continuous Emission Monitor for Active Control of Organic Emissions (Phase 1). Arthur T. Poulos, 609- 259-0501	High Accuracy Trace Gas Sensor for Remote Sites (Phase 1). Barbara A Paldus, barb@infodiag.com
Fast Analysis of Ultraspectral Measurements of Chemical Plumes (Phase 1). Marsha J. Fox, 781-273-4770	Development of a Long-Wave Infrared Imaging Spectrometer (Phase 2). Mark Dombrowski, 619-675-7404	Portable Methane Flux Meter (Phase 1). David Christian Hovde, 505-984-1322	Microsensors for In-Situ, Real-Time Detection and Characterization of Toxic Organic Substances. James G. Carter, 423-927-3717, James_Carter@eeg-inc.com
Hollow Optical Waveguide Sensor for Environmental Monitoring (Phase 2). Gregory J. Fetzer, 520-571-8660	Doppler Lidar DIAL/DISC Sensor for Plume Detection and Mapping (Phase 1). Stephen M. Hannon, 303-604-2000	Nanocomposite Sensor Array for the Detection of Multiple Toxic Air Pollutants (Phase 1). Debra J. Deininger, 720-494-8401	Tunable Tailored Filters for High-Sensitivity Chemical Detection (Phase 2). Robert A Lieberman, rlieberman@aol.com

Intelligent Unmanned Monitoring of Remediated Sites (Phase 1). Emile Fiesler (no phone)	Fiber Optic Sensor for Unexploded Ordnance (Phase 1). Michael T. Carter, 303-440-8008	Handheld Laser-Based Sensor for Remote Detection of Gas Leaks (Phase 2). Michael B. Frish, 978-689-0003	
Intelligent Unmanned Monitoring of Remediated Sites (Phase 2). Emile Fiesler (no phone)	Liquid Crystal Tunable Polarization Filter (Phase 2). Tin M. Aye, 310-320-3088		
	Low Peak Power Differential Absorption LIDAR System for Remote Characterization of Chemical Vapor Plumes (Phase 1). Christopher M. Gittins, 978-689-0003		
	Low-Cost and Low-Footprint OP-FTIR Based on Wavefront-Division Interferometry (Phase 1). Arthur T. Poulos, 609-758-8898		
	Low-Cost OP-FTIR Spectrometer with Nanoscale Reference for Industrial Monitoring (Phase 1). Julia H. Rentz, 978-887-6600		
	New Approaches to Chemical Identification in Remote Sensing FTIR (Fourier Transform Infrared) Spectroscopy (Phase 2). Joseph C. Harsanyi, 410-729-3108		
	Compact DIAL System for Chemical Vapor Sensing (Phase 2). Christopher M. Gittins, 978-689-0003		

	Multi-Sensor Exploitation Capabilities Enhancements for An Autonomous Analysis/Exploitation System (Phase 2). John Thomas, 303-421-7994		
	Midwave Infrared Imaging Spectro-Polarimeter for Laser Radar (Phase 1). Robert E. Sampson, 734-761-3174		
New Monitoring Methods for Total Cyanides, Cyanide Speciation			
		Low-Level Speciation of Cyanide in Waters (Phase 1). Dirk Wallschläger, 206-622-6960	Rapid Detection of Cyanide (Phase 2). Eugene L. Watson, 307-766-2792
		Speciation of Metallo-Cyanide Complexes by Ion-Interaction Chromatography and Ultra-Trace Fluorescence Detection (Phase 1). John W. Haas III, 802-763-8348	
Leak Detection Technologies for Small Municipal Landfills			
A Nitrate Biosensor for Monitoring Groundwater at DOE Sites (Phase 1). The Nitrate Elimination Co. (no contact person)			Sol-Gel Processed Thin-Film Nitrogen Oxides Sensors. Ayyasamy Aruchamy, 520-546-6944, amsen@azstarnet.com

Ground-Water Monitoring System for Multiple Sensors (Phase 1). Burge Environmental, Inc. (no contact person)			Continuous On-Line Monitor to Detect and Quantify Inorganic Contaminants in Water. H. Wallace Schauer, 207-767-4302, brimsness@ceemaine.org
Novel In Situ Monitoring System for Groundwaters (Phase 1). ADA Technologies, Inc. (no contact person)			Continuous On-line Monitor to Detect and Quantify Organic Contaminants in Water (Phase 1). H. Wallace Schauer, brimsness@ceemaine.org
Long-Term Electrochemical Measurement of Hazardous Metals in Groundwater (Phase 1). Stephen H. Hall, 509-582-8057			Integrated Water Quality Monitoring System (Phase 2). Sean M. Christian, 540-864-7821, schristian@airak.com
An Automated Analysis System for High-Resolution Electrical Resistivity Tomography (Phase 1). Douglas LaBreque, 775-425-9706			
Monitoring Technologies for Mining Waste Sites			
Hand-Held Monitor for On-Site Detection of Heavy Metals in Water Using Microfabricated Detector Chips (Phase 2). Michael T. Carter, 303-440-8008	E-SMART Enabled Sensor Development (Phase 2). Brian Strecker, 405-372-9535		Micro-Optic Spectroscopic Imaging Sensor (Phase 2). Tin M. Aye (no phone)
Miniaturized Flow Cell for Electrochemical Detection of Heavy Metals (Phase 2). Michael T. Carter, 303-440-8008	Midwave Infrared Imaging Spectro-Polarimeter for Laser Radar (Phase 1). Robert E. Sampson, 734-761-3174		
Technologies for Locating and Monitoring DNAPL Contamination			

A Multifunctional Fiber Optic Sensor for Cone Pentrometer Applications (Phase 1). Wei Qiu, 310-320-3088		Subsurface In Situ Volatile Organic Contaminant Sampling Using Multiple Sorbent Traps With Rapid On-Site/Off-Site Quantitative Speciation (Phase 1). Michael Dvorak, 701-237-4908	A Novel Array-Based Chemical Sensor (Phase 2). Anuncia Gonzalez-Martin, lynntech@myriad.net
Development and Evaluation of Modified Fujiwara Chemistry for Use with a Cone Penetrometer (Phase 1). Kisholoy Goswami, 310-530-7130		Integrated Downhole Gas Chromatograph and Automated Sampler for Direct Push (Phase 2). Michael Dvorak, 701-237-4908	
Internal Inspection Methods for Internally-Lined Underground Storage Tanks (USTs)			
Non-Invasive Monitoring Technologies for Mercury and Heavy Metals in Soils			
Hand-Held Monitor for On-Site Detection of Heavy Metals in Water Using Microfabricated Detector Chips (Phase 2). Michael T. Carter, 303-440-8008		Field Screening Detector for Metals in Soil (Phase 2). Amy J.R. Hunter, 978-689-0003	
Miniaturized Flow Cell for Electrochemical Detection of Heavy Metals (Phase 2). Michael T. Carter, 303-440-8008			
Next-Generation, Portable XRF System (Phase 1). Jan S. Iwanczyk, 818-709-2468			

Spark-Induced Breakdown Spectroscopy-Based Sensor for Mercury and Barium in Soils (Phase 1). Amy Hunter, 978-689-0003			
Leak Detection Methods for Underground Storage Tanks and Pipes			
		AGCS Sensor for Gas Leak Detection (Phase 1). Paula R. Wamsley, 303-933-2200	