

EDWARD SULLIVAN, P.G., ARM

DIRECTOR OF HYDROGEOLOGY

EDUCATION

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| Non-Matriculated Graduate Studies in Hydrogeology and Environmental Science Drexel University | 1991 - 1992 |
| Non-Matriculated Graduate Studies in Hydrogeology Wright State University – IRIS Program | 1988 - 1991 |
| B.A. Geology Rutgers University | 1985 |

GRADUATE COURSES

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|--------------------------------|------------------------|
| Applied Hydrogeology I | Environmental Health |
| Applied Hydrogeology II | Biostatistics |
| Groundwater Modeling (MODFLOW) | Ground Water Hydrology |
| Chemistry of the Environment | |

REGISTRATION AND CERTIFICATION

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| Professional Geologist, Pennsylvania | No. PG-001365G |
| Professional Geologist, Tennessee | No. TN-1815 |
| Certified by NJDEP as a Temporary Licensed Site Remediation Professional (LSRP) | LSRP #511697 |
| Associate in Risk Management (ARM) Certification, Insurance Institute of America (IIA) | 2004 |
| Completed 40 Hour OSHA Training Course and Annual Updates | |

RESPONSIBILITY AND EXPERIENCE, WHITMAN

Mr. Sullivan joined Whitman in September 2004. As Director of Hydrogeology, Mr. Sullivan's responsibilities include management of complex remedial investigations, hydrogeologic investigations, and remedial actions. Mr. Sullivan is involved in many site cleanups where innovative in-situ remedial technologies are used to remediate contaminated soil and ground water. Remedial technologies include chemical oxidation, enhanced in-situ bioremediation of petroleum hydrocarbons and chlorinated solvents using aerobic and anaerobic approaches, combined chemical reduction (nano-scale zero valent iron) and enhanced in-situ anaerobic bioremediation for chlorinated solvents. Use

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cutting edge geochemical and microbiological evaluations to determine feasibility and effectiveness of different bioremediation approaches. Use of TRIAD approach for rapid site characterization.

Mr. Sullivan has authored or co-authored several publications on environmental risk management and remedial technologies. Mr. Sullivan has worked as an expert on matters of environmental remediation liability and costs and has prepared expert reports for litigation on these issues.

SUMMARY OF OTHER PROFESSIONAL EXPERIENCE

O'Brien & Gere Engineers, Inc. **2004**
Edison, New Jersey

Project Manager

Managed hydrogeologic and remedial investigations for New Jersey State lead and USEPA Superfund sites. Managed large scale pilot study for enhanced in-situ bioremediation (EISB) of a large chlorinated solvent ground water plume. Prepared Remedial Action Work Plan for full scale EISB remedy.

Weston Solutions, Inc. **2001-2004**
Edison, New Jersey

Project Manager

Managed site remediation projects, hydrogeologic investigations and ASTM Phase I and II projects. Clients included both Department of Defense (U.S. Army Corps of Engineers) and private sector. Use of innovative and rapid characterization techniques including field analytical and membrane interface probe (MIP). Prepared proposals for and managed fixed price environmental liability transfer projects. Responsibilities included developing technical approach, evaluating risks, budget/cash flow projection and budget tracking.

ERM, Inc. **1988-2001**
Ewing, New Jersey

Senior Project Manager 1998-2001

Project Manager 1996-1998

Project Geologist 1988-1996

Managed site remediation projects throughout mid-Atlantic region. Client base included industrial, commercial, pharmaceutical, utilities and law firms. Site remediation experience includes preliminary assessment, site investigation, risk assessment, remedy selection and remedy implementation. Management of complex multi-disciplinary projects including state lead projects and USEPA Superfund sites in Pennsylvania, Maryland and Delaware.

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Managed environmental M&A reviews and ASTM Phase I and II projects on industrial and commercial properties. Financially quantified environmental liabilities to determine their adequacy from a reserve and total cost basis. Developed multi-case probabilistic cash flow projections to support Monte Carlo analysis of financial risk.

Completed environmental risk assessments in support of environmental insurance underwriting for a major environmental insurance provider. Evaluated site data and provided assessment of likely remedial actions and remedial cost projections. Assessments supported risk transfer policies including pollution legal liability (PLL) and cost-cap coverage.

PROFESSIONAL ORGANIZATIONS

National Groundwater Association

PUBLICATIONS AND SPEAKING ENGAGEMENTS

Sullivan E., Hince, E., "Field Evidence of Anaerobic Biodegradation of Benzene Coupled to Denitrification," presented at 25th International Conference on Soils, Sediments and Water, October 2009

"How to Use the Impact to Groundwater Standards for Soil: Case Studies of Modeling Applications," presented at New Jersey Water Environment Association (NJWEA) Site Remediation Committee Spring Program, East Windsor, NJ, June 3, 2009

"Innovative Technologies For Site Remediation," Office of Continuing Professional Education, Cook College, Rutgers University, December 8, 2008

Sullivan, E., et al., "Dehalococcoides Bioaugmentation Using Inter-Well Transfer of Bio-Trap Samplers," presented at 24th International Conference on Soils, Sediments and Water, October 2008

Sullivan, E., et al., "Dehalococcoides Bioaugmentation Using Inter-Well Transfer of Bio-Trap Samplers," presented by Greg Davis at the 6th International Conference on Oxidation and Reductive Technologies, September 2008

Sullivan E., Elliott, D.W., "Application of nZVI / Emulsified Oil at a Former Manufacturing Facility in Passaic, NJ," presented by D.W. Elliott at the Sixth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, California, May 21, 2008

Sullivan E., Robinson, D., "Critical Issues: New FASB Rules Spark an Evolution," GlobeSt.com, May 28, 2008

Sullivan E., Robinson, D., "New Technologies Reduce Time and Cost of Brownfield Redevelopment," Mann Report, April 2008

"Innovative Technologies For Site Remediation," Office of Continuing Professional Education, Cook College, Rutgers University, December 14, 2007

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Hince E.C., Sullivan, E., “Enzyme Treatment for Oxidative Stress Reduction to Support Bioaugmentation Following Activated Persulfate Injection,” presented by E.C. Hince at the 14th International Petroleum Environmental Conference, November 2007

Sullivan E., et al., “Evaluation of In-Situ Biostimulation Effects Related to Sodium Persulfate Injections,” presented at 23rd Annual International Conference on Soils, Sediments and Water, October 2007

Sullivan E., et al., “Three Dimensional Visualization of a TCE-Impacted Silt Layer Using Remote Sensing Data,” presented at the 2nd International Conference on Challenges in Site Remediation, September 2007

Hince E.C., Sullivan, E., et al., “In-Situ Stable Isotope and Fluorinated Analog Probing to Evaluate Fate of CDCE via both Reductive Dechlorination and Anaerobic Oxidation,” presented by E.C. Hince at the 23rd International Conference on Soils, Sediments and Water, October 2007

Sullivan E., et al., “Combined Chemical Oxidation and Bioremediation Treatment of a Chlorinated Aromatic DNAPL Source Area,” presented at 5th International Conference on Oxidation and Reductive Technologies, September 2007

Hince E.C., Sullivan, E., et al., “Stable Isotope Probing (SIP) of In-Situ Anaerobic Oxidation and Reductive Dechlorination Processes Using Bio-Trap Samplers,” presented by Eric Hince at Battelle, Ninth International In-Situ and On-Site Bioremediation Symposium, Baltimore, Maryland, May 2007

Hince E.C., Sullivan, E. et al., “Stable Isotope Probing (SIP) of In-Situ Anaerobic Bioremediation Processes Using Bio-Trap Samplers,” presented by Eric Hince at Intersol Conference, Paris, France, March 2007

“Innovative Technologies For Site Remediation,” Office of Continuing Professional Education, Cook College, Rutgers University, December 6, 2006

Sullivan, Edward et al., “Combined Abiotic and Biotic Dechlorination in a Low Permeability Aerobic Aquifer,” presented at the University of Massachusetts, 22nd Annual International Conference on Soils, Sediments and Water, October 2006

Sullivan, Edward et al., “Use of Electrical Imaging and Microscopy to Evaluate Distribution of Injected Nano-Scale Zero Valent Iron,” presented at the University of Massachusetts, 22nd Annual International Conference on Soils, Sediments and Water, October 2006

Sullivan, Edward, and Sylvester, Michael, “The Evolution of Environmental Risk Management” Risk Management, January 2006

Sullivan, Edward, "Here Comes the Science: Understanding the Technologies Used to Remediate Organic Pollutants" Risk Management, August 2005

Sullivan, Edward, "Estimating Environmental Liabilities: One Price Does Not Fit All" Risk Management, July 2005

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OTHER COURSES AND SEMINARS ATTENDED

Introduction to Risk Management, Insurance Institute of America

Risk Financing, Insurance Institute of America

Risk Control, Insurance Institute of America

Site Remediation Technical Seminar, ERM, Inc.

Remedial Decision Making, Cook College Office of Continuing Education

Site Remediation Basics, Cook College Office of Continuing Education

Brownfields Redevelopment – A New Jersey Opportunity, Cook College Office of Continuing Education

Remediation in New Jersey, Cook College Office of Continuing Education

ISRA 2000, New Jersey Institute for Continuing Legal Education

Beyond the Basics: Technical Requirements for Site Remediation in New Jersey

New Jersey Insurance Coverage Institute Seminar, Lowenstein Sandler PC

Consumers Guide to Remediation, ERM, Inc.

Advanced Technologies for Natural Attenuation, Regenesys Inc.

Seminar on Characterizing and Remediating Dense Non-Aqueous Phase Liquids at Hazardous Sites, USEPA

Advanced Tools for In-Situ Remediation, Long Island Groundwater Research Institute

Environmental Forensics Workshop, Annual International Conference on Soils, Sediments and Water

Innovative Technologies for Site Remediation, Cook College Office of Continuing Education

Site Remediation in New Jersey: Practical Application of the Soil Cleanup Standards; NJWEA Spring 2009 Program