KAVITHA SUBRAMANIAM, Ph.D.
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EDUCATION

- Ph.D., Environmental Engineering, Georgia Institute of Technology, Atlanta, Georgia, 2000
- M.Eng., Environmental Engineering, Memorial University of Newfoundland, St. John's, Canada, 1996
- B.Tech., Chemical Engineering, Anna University, Chennai, India, 1994

CERTIFICATIONS AND TRAINING

- New Jersey Licensed Site Remediation Professional (LSRP) – License # 715043
- 40-Hour OSHA Health and Safety Certification
- 8-Hour OSHA Refresher Training

EMPLOYMENT HISTORY

• September 2016 to Present	Principal and Deputy Program Manager, CDM Smith
• April 2010 to September 2016	Senior Project Manager, Langan Engineering & Environmental Services
• August 2009 to March 2010	Project Manager, Princeton Geoscience, Inc.
• March 2003 to July 2009	Project Manager, ENVIRON International Corporation
• July 2001 to February 2003	Project Engineer, Golder Associates
• June 2000 to June 2001	Post-Doctoral Researcher, Smith College

PROFESSIONAL AFFILIATIONS

- New Jersey Society of Women Environmental Professionals, Chair (March 2016 to Present)
- New Jersey Society of Women Environmental Professionals, Scholarships Committee Chair (December 2013 to June 2016)
- Licensed Site Remediation Professional Association (LSRPA) Next Gen Chair (January 2016 to January 2018)

SUMMARY OF QUALIFICATIONS

Dr. Subramaniam has over nineteen years of diverse experience in the environmental consulting business with projects involving site and remedial investigations, remedial design, remedy implementation, including *in situ* remediation, development of remedial costs and liability estimates, cost allocations between responsible parties, litigation support, and environmental due diligence. Dr. Subramaniam has managed several projects in New Jersey, New York, and Connecticut, among other States and Canada. She has significant experience working on Superfund projects. She has considerable

experience assisting clients negotiate remediation requirements and timeframes with regulatory agencies.

RELEVANT EXPERIENCE

Relevant site investigation and remediation experience includes the following:

- Overseeing the management and performance of investigation and remediation activities at approximately 15 superfund sites in Region 2. Coordinating with project managers to ensure that project performance exceed client expectations and projects are performed under budget and within schedule. Close interactions with EPA Region 2 remedial project managers, project officer and contracting officer to ensure client satisfaction.
- Managed remedial investigations and remediation of extensive groundwater plumes at multiple sites in southern New Jersey. Developed remedial investigation reports, remedial action work plans and designs for *in situ* thermal treatment and bioremediation to address chlorinated groundwater contamination in groundwater. Managed the operations, maintenance, and monitoring of vapor mitigation systems installed at the properties to mitigate vapor intrusion issues.
- Implemented *in situ* thermal remediation via electrical resistance heating to address tetrachloroethylene contamination in groundwater. Technology resulted in remediation of high concentration source area to below applicable standards within a one-year timeframe, which resulted in significant long-term cost savings to the Client.
- Managed multiple projects with a vapor intrusion Immediate Environmental Concern (IEC) condition. Installed sub-slab depressurization systems and conducted near-slab, sub-slab and indoor air testing to evaluate system performance. Closely interacted with NJDEP to communicate compliance with regulatory and mandatory timeframes for IEC response actions and reporting.
- Managed impacts to residential potable wells (potable water IEC) resulting from chlorinated solvent groundwater contamination at a former maintenance facility. Installed point of entry water treatment systems at approximately 20 residences, conducted routine and emergent monitoring and maintenance of the systems, communicated with residents to provide updates on the status of their drinking water, closely interacted with NJDEP to report on findings.
- Managed the implementation of *in situ* chemical reduction of hexavalent chromium (Cr(VI)) in soils using calcium polysulfide at a site in Camden, New Jersey. Post-remediation testing revealed successful reduction of Cr(VI) to Cr(III) using direct push technologies, which resulted in the development of a design to implement the remedy on a larger site-wide scale.
- Technical Advisor to the LSRP for a former petroleum storage, blending, and distribution facility in Bayonne, NJ. Reviewed and provided technical guidance on Remedial Investigation and Remedial Action Plans. Worked directly with the NJDEP to obtain approvals for groundwater reclassification to Class IIIB, alternate cleanup standards for soils and groundwater, air permit to support extensive soil excavations planned for 2016, land use coastal general permit and flood hazard area individual permit to support the planned 2016 remedial actions, all of which resulted in significant project cost savings. Provide technical input to the LSRP for issuance of a Response Action Outcome to close out Areas of Concern at the site.
- Managed the design, engineering, and implementation of *in situ* bioremediation using emulsified vegetable oil in a down-gradient barrier for remediating groundwater impacted with Cr(VI) and chlorinated solvents.

- Managed remedial investigations and remediation of impacted storm water drywells and septic system areas at two sites in Melville, New York. Prepared remedy completion reports and negotiated with agency officials to obtain approval of no further action determination for the sites.
- Managed the remedial investigation and remediation of impacted soils and wood chips at a commercial facility in Milford, Connecticut. The remedial action included excavation and off-site disposal of impacted materials.
- Designed an *in situ* bioremediation remediation system and developed a remedy performance monitoring program for an active manufacturing facility in Ohio.
- Evaluated remedial alternatives proposed by the USEPA for soils at a Superfund Site in New Jersey. Reviewed and summarized alternative remedial approaches in technical memoranda, provided comments to the National Remedy Review Board on USEPA's proposed remedial alternatives and recommended a more cost-effective remedial approach for inclusion in the feasibility study.
- Estimated costs for numerous remedial investigations, feasibility studies, and remediation projects. Prepared estimates of future environmental liabilities and response costs at several facilities with soil and groundwater contamination. Prepared cost estimates to support opinions in expert reports prepared for litigation matters. Used RACER cost estimation software to derive cost estimates.
- Performed characterization and evaluation of natural attenuation mechanisms in groundwater at a Superfund site. Carried out non-parametric statistical analyses to evaluate trends in contaminant concentrations.
- Managed a litigation support matter involving researching historical operations, determining the extent of environmental contamination, remediation strategies, and past and future liabilities at approximately 60 mining sites. Supervised and compiled the work product of eight staff members, and estimated total remediation liabilities for all 60 sites.
- Managed remedial investigations, prepared remedial action work plan and remedial design, and implemented the selected remedy at an office building in Newark, New Jersey. The remedial action included excavation and off-site disposal of soils impacted with pesticides.
- Managed remedial investigations, prepared remedial action work plan and recommended the capping of low level polychlorinated biphenyl impacted soils at an active manufacturing facility in Newark, New Jersey. The recommended alternative resulted in significant cost savings to client as compared to the initially selected remedy of excavation and off-site disposal.
- Developed a feasibility study to address soil, groundwater, and free product contamination at a Superfund site in Bridgeport, New Jersey. Remedial alternatives evaluated included in-situ chemical oxidation, thermal treatment, enhanced bioremediation, and air sparging/soil vapor extraction (AS/SVE).
- Implemented in-situ chemical oxidation using hydrogen peroxide and potassium permanganate at a former manufacturing facility in Yardville, New Jersey, to remediate chlorinated solvent (tetrachloroethylene) contamination in groundwater.
- Managed compliance with the Industrial Site Recovery Act (ISRA) at several New Jersey sites. Specific responsibilities included the oversight and preparation of preliminary assessments, site and remedial investigations, remedy implementation, and preparation of remedial action reports.

- Prepared technical bid specifications as part of remedial design packages for various remedial actions including demolition of a semi-conductor manufacturing facility in Pennsylvania, and excavation and off-site disposal of impacted soils at an operational facility in Ohio.
- Worked on the design of environmental remediation systems. Process engineering tasks performed included analysis and evaluation of pumping and piping, process hydraulics, calculation of mass and heat balances, and air emissions calculations.
- Assisted with site-wide remediation of an operating facility. Assessed biogeochemical conditions and plume profiles through 3-D visualization modeling. Environmental Visualization System (EVS) modeling included investigations of chlorinated solvents and other contaminants of concern in groundwater. Evaluated soil and groundwater remedial alternatives as part of a Corrective Measures Study. Prepared an underground injection control permit application for bimetallic nanoscale colloid injection as one of the remediation options.
- Evaluated chemical precipitation and well clogging in the vicinity of a groundwater treatment plant through computation of metal speciation and reaction in the geochemical environment using PHREEQC model. Recommended the use of alternate coagulants in the treatment plant to minimize metal precipitation.
- Developed generic performance assessment criteria for determining risk associated with chemical/mixed radioactive waste disposal. Performed fate and transport assessment of various classes of chemicals in the biogeochemical environment.
- Investigated the feasibility of accelerated aerobic biological treatment of chlorinated aromatic compounds including chlorobenzene at a landfill site. Evaluated oxygen requirements and possible precipitation of metallic species during oxygenation in the aquifer matrix.
- Performed 3-D visualization modeling of groundwater flow and drawdown at pumping wells and river boundaries.
- Performed extensive 3-D visualization modeling of site hydrostratigraphy and plume profiles of various contaminants of concern. Calculated volume and mass of soil contamination in various geologic units. Calculated site-specific Tier II soil leaching values for contaminants of potential concern in order to assess impacts to groundwater. Objective was to delineate the extent and amount of contamination to assist in apportioning investigation and remedial costs at the site based on historic chemical usage and transport and cross-media contamination.
- Designed leachate vault and collection system relocation based on a berm expansion project at an active landfill site. Calculated pump operating capacities for existing and proposed leachate collection systems. Prepared construction drawings to indicate necessary modifications to mechanical components of the leachate collection and conveyance system.
- Prepared a landfill gas management and recovery plan including blower and flare design, and future use of recovered gas. Calculated landfill gas emission and condensate generation rates using published air pollution emission factors, and evaluated disposal options.

Relevant Experience Prior to Environmental Consulting (at Smith College, Northampton, PA)

- As part of post-doctoral research, developed an innovative remediation technology to enhance PAH compound desorption and bioremediation through the use of chelating agents. Tested technology at a former manufactured gas plant facility owned by Northeast Utilities in Connecticut.

PUBLICATIONS (PEER-REVIEWED)

Subramaniam, K., Stepp, C., Pignatello, J.J., Smets, B.F., and Grasso, D., Enhancement of Polynuclear Aromatic Hydrocarbon Desorption by Complexing Agents in Weathered Soil, Environmental Engineering Science, Vol. 21, No. 4, pp. 515-523, July 2004.

Subramaniam, K., Vithayaveroj, V., Yiacoumi, S., and Tsouris, C., Copper Uptake by Silica and Iron Oxide under High Surface Coverage Conditions: Surface Charge and Sorption Equilibrium Modeling, Journal of Colloid and Interface Science, Vol. 268, No. 1, pp. 12-22, 2003.

Grasso, D., Subramaniam, K., Butkus, M., Strevett, K., and Bergendahl, J., A Review of Non-DLVO Interactions in Environmental Colloidal Systems, Re/Views in Environmental Science and Bio/Technology, Vol. 1, pp. 17-38, 2002.

Grasso, D., Subramaniam, K., Pignatello, J.J., Yang, Y., and Ratte, D., Micellar Desorption of Polynuclear Aromatic Hydrocarbons from Contaminated Soil, Colloids and Surfaces A, Vol. 194, No. 1-3, pp. 65-74, 2001.

Subramaniam, K. and Yiacoumi, S., Modeling Kinetics of Copper Uptake by Inorganic Colloids Under High Surface Coverage Conditions, Colloids and Surfaces A, Vol. 191, No. 1-2, pp. 145-179, 2001.

Subramaniam, K., Yiacoumi, S., and Tsouris, C., Copper Uptake by Inorganic Particles – Equilibrium, Kinetics and Particle Interactions: Experimental, Colloids and Surfaces A, Vol. 177, pp. 133-146, 2001.

Subramaniam, K., Metal Uptake and Its Effects on Colloidal Particle Interactions: Equilibria and Rates, Ph.D. Dissertation, Georgia Institute of Technology, May 2000.

Subramaniam, K., Yiacoumi, S., and Tsouris, C., Effect of Copper and Cadmium Binding on Flocculation of Ferric Oxide Particles, Separation Science and Technology, Vol. 34, No. 6-7, pp. 1301-1318, 1999.

Subramaniam, K., Yiacoumi, S., and Tsouris, C., A Unified Model for Metal Ion Sorption and Colloidal Particle Flocculation Rates, Fundamentals of Adsorption 6, pp. 951-956, 1998.

Subramaniam, K., Changes in the Physical, Hydraulic and Microstructural Properties of Clays Exposed to Organic Chemicals, Masters Thesis, Memorial University of Newfoundland, August 1996.

SELECTED CONFERENCE PRESENTATIONS

Subramaniam, K., Grasso, D., Smets, B.F., and Pignatello, J.J., Effect of Chelating Agents on PAH Compound Desorption and Soil Colloid Mobilization, 75th Colloid and Surface Science Symposium, Carnegie Mellon University, Pittsburgh, PA, June 10-13, 2001.

Subramaniam, K., Yiacoumi, S. and Tsouris, C., Copper Sorption and its Effects on Flocculation of Oxide Colloids: Equilibria and Rates, 218th ACS National Meeting, Washington, D.C., August 19-24, 2000.

Subramaniam, K., Yiacoumi, S. and Tsouris, C., Metal Ion Sorption and its Effects on Flocculation of Colloidal Particle Interactions, 74th Colloid and Surface Science Symposium, Lehigh University, Bethlehem, PA, June 19-21, 2000.

Subramaniam, K., Yiacoumi, S. and Tsouris, C., Copper Adsorption at Hematite- and Silica-Water Interfaces, AIChE Annual Meeting, Dallas, TX, October 31-November 5, 1999.

Subramaniam, K., Sorption Phenomena and Colloidal Particle Interactions, National Science Foundation Workshop for Engineering Educators, WEE ’99, Arlington, VA, September 26-29, 1999.

Subramaniam, K., Chin, C.J., Yiacoumi, S. and Tsouris, C., Changes in Particle Flocculation Behavior Due to Adsorption of Metal Ions from Aqueous Solutions, 217th ACS National Meeting, Anaheim, CA, March 21-25, 1999.

Subramaniam, K., Metal Ion Sorption by Oxide Particles: Equilibrium, Kinetics and Particle Interactions, Quadrangle Conference, Virginia Institute of Technology, Blacksburg, VA, February 12-14, 1999.

Subramaniam, K. and Morin, P., Effect of Organic Liquids on the Physical, Hydraulic, and Microstructural Properties of Clays Used in Landfill Liners, Canadian Geotechnical Society Conference, St. John's, NF, Canada, September 1996.