



SPECIALTY EARTH SCIENCES, LLC
New Albany, Indiana

LINDSAY M. SWEARINGEN
Managing Partner/ Principal Scientist

EDUCATION

B.S. Optometry,
Doctor of Optometry,
Indiana University: Bloomington, Indiana

PhD coursework in Toxicology, Pharmacology, Public &
Environmental Health
University of Louisville: Louisville, Kentucky

Relevant graduate coursework:

- Systemic Physio-Pharmacology I&II
- General Pathology
- Medical and Ocular Biochemistry
- Histology
- Epidemiology & Biostatistics
- Principles of Drug Action (Toxicology)
- Risk Assessment
- Scientific Writing

AREAS OF EXPERIENCE

- Years of Experience – 19
- Years with IU as Lab Instructor – 2.0
- Years with IU as a Student Researcher – 2.0

Dr. Lindsay Swearingen is currently serving as Managing Partner/ Principal Scientist at Specialty Earth Sciences, LLC in New Albany, Indiana on a variety of environmental research and development projects, business management, and related areas.

Dr. Swearingen's past work experience includes two years of laboratory research at the Indiana University (Bloomington) Biology Department. Dr. Swearingen also served as an undergraduate lab instructor for the Indiana University (Bloomington) Biology Department. Job duties included laboratory experiment design, laboratory instruction to undergrad students, data collection and interpretation, technical report construction, day-to-day laboratory management, and various office works.

Co-developer of several proprietary, patented and patent-pending in-situ chemical oxidation processes, including:

- Encapsulated Environmental Reactants
- Directionally Drilled Permeable Reactive Barriers
- In Situ Remediation Installation Methods
- Remediation Deployment Hardware

PROJECT EXPERIENCE

- Co-developer of several proprietary, patented and patent-pending in-situ chemical oxidation processes, including:
 - Encapsulated Environmental Reactants
 - Directionally Drilled Permeable Reactive Barriers
 - In Situ Remediation Installation Methods
 - Remediation Deployment Hardware
- Lead laboratory experiment designer, regarding site specific bench scale studies and soil geochemical interference evaluation
- Conducted numerous oxidation and reduction experiments regarding the treatment of contaminants such as VOC's, heavy metals, and petroleum hydrocarbons
- Continuous in-house research and process optimization for in-situ and ex-situ remediation products and application methods
- Prime point of contact with third party specialty laboratories, subcontracted research and development companies, and third-party independent chemical and/or biological consultants.
- QA/QC oversight for SE Sciences' EPA Brownfields Assessment Grant project sites - Phase II and FSI projects
- Development and implementation of Specialty Earth Sciences' PARCCS (Precision, Accuracy, Representativeness, Completeness, Comparability, and Sensitivity) data analysis process

PRESENTATIONS AND PUBLICATIONS

Presentations:

Association for Environmental Health and Sciences Foundation (AEHS)

- West Coast Conference 2016 – Combining Solar Technology with Sustained and Controlled Release Reactants
- East Coast Conference 2016 – Low-Cost, Low-Maintenance, and Green Reactive Interceptor Zones
- West Coast Conference 2017 – Reactive Interceptor Zones – Green and Sustainable Approach to In-Situ Remediation
- West Coast Conference 2018 – Controlled Release Environmental Reactants – In-Situ Soil and Groundwater Remediation of Recalcitrant Compounds and Emerging Contaminants of Concern

American Institute of Professional Geologists (AIPG)

- Georgia Conference 2015 – Sustained Oxidation and Controlled Oxidant Release In-situ Remediation Technology

Environmental Show of the South (TN Dept of Environment & Conservation)

- 2016 Conference – Sustained Oxidation and Controlled Release Encapsulants
- 2017 Conference – Controlled Release Environmental Reactants – Green and Sustainable Approach to In-Situ Remediation
- 2018 Conference -
 - Controlled Release Environmental Reactants – A More Efficient Approach to In Situ Remediation
 - Vapor Intrusion Mitigation – Engineering controls for indoor air protection of large commercial structures

Florida Remediation Conference

- 2016 Conference – Controlled Release Environmental Reactants – Green and Sustainable Approach to In-Situ Remediation
- 2017 Conference – Controlled Release Environmental Reactants – In-Situ Soil and Groundwater Remediation of Recalcitrant Compounds and Emerging Contaminants of Concern

Groundwater Resources Association of California

- 2017 Annual Conference – Controlled Release Environmental Reactants – In-Situ Soil and Groundwater Remediation of Recalcitrant Compounds and Emerging Contaminants of Concern

Patents and Publications:

US Patent No: 7,431,849 – Encapsulated Reactant and Process
US Patent No: 8,210,773 – A Process for In-Situ Treatment of Soil and Groundwater
US Patent No: 8,366,350 – A Process for In-Situ Treatment of Soil and Groundwater
US Patent No: 9,061,333 – A Process for In-Situ Treatment of Soil and Groundwater
US Patent No: 9,611,421 – Encapsulated Reactant and Process
US Patent No: 9,943,893 – String of Reactant Chambers and Process Thereof
US Patent No: 10,053,964 – An Apparatus and Method for Puncturing a Pipe
US Patent No: 10,335,757 – A Process for Making Environmental Reactants
US Patent No: 10,647,045 – Shaped or Sized Encapsulated Reactant and Method of Making
US Patent No: 10,822,930 – Apparatus and Method for Puncturing a Pipe
US Patent No: 10,821,489 – Encapsulated Reactant and Process
US Patent No: 10,982,528 – String of Reactant Chambers and Process Thereof
US Patent No: 11,370,007 – Encapsulated Reactant and Process
US Patent No: 11,331,839 – Shaped or Sized Encapsulated Reactant and Method of Making

US Patent No: 10,843,241 – A Method and System for In Situ Treatment of Water or Soil
Japanese Patent: 6058708 – A Process for Making Environmental Reactants
US Pat App No: 17-373,315 – Encapsulated Reactant and Process
US Pat App No: 17-735,669 - Encapsulated Reactant and Process
US Pat App No: 17-148,559 – Controlled Release Adjunct for Contaminant Treatment