

GES Presentation Schedule

28th Annual International Conference on Soil, Water, Energy, and Air hosted by AEHS Foundation

March 19-22, 2018 | Marriott Mission Valley, San Diego, CA

Tuesday, March 20, 2018 at 11:00 AM

A Method to Estimate Historical LNAPL Volume and Mass Losses from Composition Changes, presented by Don Lundy, PhD, PG

Even when the date and volume of a sudden release of light non-aqueous phase liquids (LNAPL) is known from available records, the volume that reaches the water table remains unknown. This speaker presents an approach to estimating the volume that reached the water table after a 1979 crude oil pipeline release near Bemidji, Minnesota. He quantified changes in the relative abundances of hydrocarbons in archived historical oil samples, and compared those to relative abundances of the same compounds in a historical pipeline sample to quantify the trend in mass losses and fraction of mass remaining. He calibrated the historical trend in relative mass remaining to a U.S. Geological Survey estimate of volume of oil on the water table from 142 core samples collected 1990-1992. The starting volume and mass reaching the water table in 1979 was back-calculated from this trend. The derivative of a best-fit trend function defined the rate of mass depletion with time since 1979. Those rates were found to fall within the range of independently-measured rates of mass depletion based on measuring and/or modeling rates of CO₂ production over the oil body resulting from biodegradation of hydrocarbons partitioned to the groundwater and vadose zones.



About the Presenter

Don Lundy, PhD, PG, is a Principal Hydrogeologist specializing in site characterization and development of conceptual designs for remediation systems used to treat LNAPL or dense non-aqueous phase liquids (DNAPL). He also assists clients with negotiating site closures when exposure risks are negligible, LNAPL/DNAPL recovery has reached practical limits, and when LNAPL/DNAPL bodies have reached stable configurations. Don has participated in the development of ASTM guidance related to LNAPL conceptual site model development and with LNAPL transmissivity guidance. He has also led several LNAPL short courses for the National Ground Water Association and regulatory agencies across the US.

Tuesday, March 20, 2018 at 11:00 AM

Remedy Performance Reporting — Driving Remediation System Optimization and Site Progression, presented by Kevin Michael Lienau, PE

Tracking and understanding remediation system performance and safe operation are critical to managing a business' environmental liability portfolio. Many large corporations must manage and account for a wide range of site conditions and history, geography, regulatory programs, and environmental consultant cultures and practices. This presents a challenge in centralized portfolio management and system optimization. One solution to this challenge is the development of a systematic approach for routine collection and analysis of site and remediation system data. This presentation explores proven tools and methods that have been developed and deployed by various responsible parties to manage long-term environmental liabilities. This holistic approach includes not only performance optimization, but also proactive risk identification and mitigation, life cycle cost analysis, and steps to drive the site towards closure. These programs typically include written technical practices, standardized field reporting formats, remediation system key performance indicator reports, and routine site visits by senior leadership and technical staff. Implementing a standardized remedy performance monitoring and reporting approach offers businesses significant opportunities to improve efficiency within remediation projects, increasing safety for workers and surrounding communities, reducing waste, and protecting the environment—particularly at sites undergoing long-term operation, maintenance, and monitoring activities.

Wednesday, March 21, 2018 at 3:00 PM (Poster)

Technical Approaches to Reduce Remediation Costs at Former Refinery—A Success Story, presented by Kevin Michael Lienau, PE

A former petroleum refinery property exhibited widespread, elevated concentrations of lead in surface soil resulting from historic refining processes. The site was entered into the Texas Commission on Environmental Quality Texas Risk Reduction Program to prepare it for beneficial reuse; however, the potential presence of the Texas horned lizard, a threatened species, risked a significant escalation of remediation costs. This poster presentation discusses GES' comprehensive approach to site investigation and remedial strategy, including innovative field screening methods, ecological surveys, and development of a site-specific ecological risk assessment. The integrated approach facilitated site closure via technically sound least-cost measures that were protective of human health and the environment. Cost savings in excess of \$1 million were achieved by the acceptance of the industrial/commercial human ingestion/exposure criteria as the critical Tier 2 protective concentration levels. In addition, GES' implementation of lead fixation technology for potentially hazardous soils reduced disposal costs by approximately \$3 million.



About the Presenter

Kevin Michael Lienau, PE, is a Principal Engineer with more than 25 years of environmental systems engineering and process control experience. Kevin possesses specialized expertise in the areas of soil and groundwater remediation system design and optimization, cost estimating, expedited site cleanup programs, chemical oxidation and chemical reduction technology, in-situ carbon-based material injection, and process instrumentation and control systems. His background also includes industrial facility auditing, spill prevention, control, and countermeasure plan preparation, stormwater pollution prevention plan preparation, National Pollutant Discharge Elimination System permitting and compliance, and landfill leachate and gas system operations. Kevin is a registered professional engineer in more than 20 jurisdictions. He holds a Bachelor of Chemical Engineering and Bachelor of Material Science and Engineering from the University of Minnesota.

Wednesday, March 21, 2018 at 3:00 PM (Poster)

LNAPL Management: Strategy Development Through Investigation, LCSM and NSZD, presented by Christopher Mulry, PG

Operation of a fuel storage and distribution terminal in South Carolina from the 1940s through the late 1980s resulted in an LNAPL plume, consisting primarily of kerosene/jet fuel, approximately 30 to 40 feet below ground surface. Investigation and remediation efforts have been ongoing since the late 1980s. Recovery rates demonstrate a clear decline over time and the LNAPL plume has correspondingly reduced in extent, yet conditions still do not meet state standards for cessation of remediation. This poster presentation evaluates and shares project datasets that include changes in LNAPL plume footprint and recovered fuel volumes, laser-induced fluorescence analysis, baildown test results, and lab results. Trends and correlations among these datasets will be discussed in the context of development of a practical site management strategy and development of technically-defensible remedial endpoints. Findings from this body of work mirror key lessons identified from recent advances in LNAPL science; namely, in-well LNAPL thickness is a poor indicator of mobility or recoverability, oil transmissivity proved to be a meaningful basis for gauging relative LNAPL recoverability, and natural destruction mechanisms appear to outpace mechanical extraction techniques in LNAPL removal.



About the Presenter

Christopher Mulry, PG, possesses a diverse background in the areas of environmental investigation, risk management, and the design, operation, and maintenance of soil and groundwater remediation and management programs—primarily at petroleum facilities across the US and internationally. Chris has completed dozens of investigative and remediation programs in a wide range of site settings with an emphasis on conceptual site model (CSM) development. Chris has presented to industry groups on a wide range of topics such as fractured rock characterization, LNAPL behavior, direct sensing tool use, and petroleum vapor intrusion. He is a licensed professional geologist in the states of Delaware, Pennsylvania, Virginia, and New York. He holds bachelor's and master's degrees in Geology from the University of Delaware and University of Maine respectively.