

INCREASING NAPL REMEDIAL EFFICIENCIES IN BEDROCK ENVIRONMENTS

Raj Mahadevaiah, P.E., C.G.W.P.

Recovering NAPLs from the bedrock environment poses a different set of challenges in comparison to recovery in unconsolidated overburden (water-table) environments. Even basic volumetric equations cannot be used to calculate NAPL recovery in an uncased open borehole in fractured bedrock or in carbonate rock with vugs, or caverns. In addressing NAPL recoveries in a variety of geological settings both within the USA and overseas, EIC has encountered a number of difficult issues that do not have a clear answer. The following is a partial list of questions that plague the industry:

- How can NAPL volumes in an open-hole, vugs, or caverns be calculated?
- How can recovery rates in bedrock formations be estimated?
- How can recharge volumes be estimated?
- How can on-going leaks and spills be detected?
- How can the remedial progress in fluctuating water level environments be measured?
- Why are vapor-extraction, pumping systems, and traditional technologies less effective in bedrock environments?
- What is the most practical remedial tool to reach end points sooner?

During the presentation, we will present EIC's unique approach in answering these questions. EIC has also developed a unique set of equations that can be used in clearly answering some of the questions. The presentation includes case histories on several petroleum release sites where EIC has successfully saved time and money during the past 10 years. Instead of finding workarounds, EIC is reaching remedial end-points in record time at several sites around the world. Our patented non-aqueous phase extraction technique (NET) -based systems have been engineered to operate in a variety of geologic formations from simple sand-and-gravel aquifers to bedrock environments in a wide geographic region at several sites in the USA, The Caribbean, The Middle East, and India.

For further information, please contact:

*Raj Mahadevaiah, P.E., C.G.W.P.
Environmental International Corporation
11690 Teasley Place, Alpharetta, GA 30022
Phone: 770.772.7100 Extn. 23
Fax: 770.772.0555
Web site: <http://www.eicusa.com>
Email: rajmahadevaiah@eicusa.com*

Mr. Raj Mahadevaiah is President and CEO of Environmental International Corporation - an environmental engineering firm headquartered in the Atlanta metro area. Mr. Mahadevaiah has a M.S. degree in Civil Engineering (Groundwater Emphasis) from the University of Oklahoma, USA. Also, he is a registered professional engineer in over 13 states within the USA. Over the last 24 years, Mr. Mahadevaiah has developed expertise in conducting, environmental assessments and remediation, project management, and litigation support at over 200 sites in the North America, The Caribbean, The Middle East, South Asia, and other nations world-wide. At numerous sites, he has conducted multimedia due diligence and compliance audits for ISO 14001-related projects involving air, surface water, soil, groundwater, hazardous waste, and noise issues at various facilities. He has designed, implemented, operated, and maintained remediation systems at petrochemical storage and distribution facilities, public and private electric utilities, refineries, conveyance facilities, superfund sites, landfill, RCRA sites, and other hazardous waste facilities. At several sites, Mr. Mahadevaiah has critically evaluated existing remediation systems and developed cost-effective alternatives. He also developed telemetry-based remediation systems to manage remote sites in the Caribbean. In addition, he has solved environmental puzzles from multiple sources, during litigation support, and successfully served as an expert witness in trials for industrial, insurance, and law firms. Apart from over a dozen technical papers presented at various locations worldwide, Mr. Mahadevaiah has also served as a panelist representing the Electric Utility Industry concerning "The RCRA Reauthorization Bill proposed by the US Congress," at the Air and Waste Management Conference held in Vancouver, British Columbia.