Watech-2013
International Exhibition and Conference on
Water Technologies, Environmental Technologies & Renewable Energy
February 13-14, 2013 Bombay Exhibition Centre, Mumbai, India

Modeling *in situ* bioremediation using Meshfree Point Collocation Method (PCM)

Eldho T.I

Indian Institute of Technology Bombay, India

Abstract

The goal of *in situ* bioremediation is to stimulate microorganisms with nutrients and other chemicals that will enable them to destroy the contaminants. The bioremediation systems in operation today rely on microorganisms native to the contaminated sites, encouraging them to work by supplying them with the optimum levels of nutrients and other chemicals essential for their metabolism. Regardless of whether the microbes are native or newly introduced to the site, an understanding of how they destroy contaminants is critical to understanding bioremediation. The types of microbial processes that will be employed in the cleanup dictate what nutritional supplements the bioremediation system must supply. The simulation of *in situ* bioremediation helps to understand the remediation process. Numerical methods help in understanding the complex nature of the groundwater pollution transport and remediation process. *In situ* bioremediation can be modeled by solving biodegradation equations, locating the oxygen injection wells and fixing up the time of remediation. Meshfree (MFree) method is a numerical approach to solve these partial differential equations (PDE) in a simple manner. The method uses number of scattered nodes in the domain and on the boundary. In this paper, for simulation of bioremediation, a MFree Point Collocation Method (PCM) based simulation model, PCM-BIO, is proposed. This model is applied to a field case study and is found to be an effective and simple model for *in situ* bioremediation of groundwater contamination.

Biography

Eldho T.I. has completed his Ph.D in 1995at the age of 29 years from IIT Bombay and postdoctoral studies from University of Karlsruhe, Germany. He worked as Senior Research Fellow at National Taiwan University during 1998-1999. For the past 12 years, he is working as Professor at Department of Civil Engineering, IIT Bombay. He has published more than 250 papers in reputed journals and conferences. He is also working as Editor/ Assoc. Editor for 3 International Journals and a reviewer for more than 30 reputed International Journals.