

Model development for process control of the enhanced *In-Situ* Bioremediation (ISB) in superfund sites

Samuel Oludayo Alamu
Morgan State University, USA

Large amounts of the hazardous waste (at least 80%) sites in the United States have contaminated ground water and soil. Conventionally, the treatment of contaminated ground water has been done by extracting the contaminated water, treating it above ground and reinjecting or discharging the clean water ("pump and-treat"). The extracted contaminants must be disposed of separately. It is becoming increasingly apparent that pump-and-treat technologies

require considerable investment (between \$14-17 million) over a long time (30 years or longer) and may not actually clean up the source of the contamination (US EPA). *In-situ* bioremediation techniques involve the introduction of a group of natural microbial strains or a genetically engineered strain to treat contaminated soil or water arising from industrial processes. This technique is less expensive and efficient cleaning since it does not send dust and contaminants into the surrounding area. But it requires large amount of time for full decontamination and less effective to manage. Therefore, there is a critical need to develop a process control model for efficient degradation of organic and inorganic contaminants in these areas

which are of national priority. In this research, selected strains of bacteria are being added to the subsurface treatment, poultry litter will be used as co-substrates and laboratory assay will be performed to determine rate of decontamination in respect to microbial activities. Finally, a process control model for enhanced ISB system will be developed to evaluate effectiveness and estimate contaminant treatment times.

Biography

Samuel Oludayo Alamu completed his bachelor's degree in Chemical Engineering at a reputable University in Nigeria. Currently, he is pursuing his graduate research studies in Industrial and Systems Engineering at Morgan State University, USA, where he equally works as research assistant in Center for Advanced Energy Systems and Environmental Control Technology laboratory. He has over four years of research experiences and has published three research articles available online with additional two currently undergoing review.

oludayo_samuel@yahoo.com