Enhanced Bioremediation of Contaminated Soils using Sustainable Soil Amendments

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Agricultural, industrial, and military sites have been successfully remediated throughout the world using sustainably produced organic soil amendments over the past 25 years. Contaminants treated using this approach have included petroleum hydrocarbons, PAHs, phthalates, chlorinated phenols, chlorinated herbicides such as 2,4-D, and chlorinated pesticides including Lindane.

The presentation will review field data and case study where the soil amendments, known as Terramend® reagents is compared to traditional amendment like agricultural fertilizer and manure. The Terramend Reagent is manufactured using processed plant materials, a balanced blend of nutrients, and a food grade emulsifying agent.

This formulation promotes more rapid and complete destruction of the targeted contaminants and enables the attainment of industrial and even residential land use standards. This approach to soil remediation provides a more economical and environmentally sustainable alternative to excavation, thermal treatment, or off-site soil disposal by landfilling.

Many large-scale projects using Terramend® reagents have been completed in Canada, the United States, and Europe. Together, these projects have resulted in remediation of more than 1,000,000 tons of soil, sediment, and industrial process wastes. Treatment has been conducted both in situ without excavation, on-site following soil excavation, and off-site at soil treatment centers.

The presentation will illustrate how Terramend® reagents improve soil microbial ecology by increasing the supply of bioavailable water and nutrients and reducing acute soil toxicity. These changes lead to increased microbial growth and support more rapid contaminant destruction as compared to alternate bioremediation approaches. Results from bench-scale testing and full-scale projects will be presented and discussed from the perspectives of performance and cost. Brief case studies will illustrate attainable removal efficiencies as well as recognized limitations to this type of soil remediation.

Alan Seech

Dr. Seech has over 15 years experience in applied environmental microbiology with a focus on (remediation of soil, sediment, and other solid wastes). He has worked on more than 50 sites throughout the world on bioremediation of soil, sediment, and other solid wastes contaminated with hard to degrade organics including chlorinated pesticides, PAHs, phthalates, and organic explosive compounds. Dr. Seech has published numerous articles on bioremediation and biodegradation of organic contaminants in soil, and presented more than thirty papers at international conferences on bioremediation. In 2002, working with a group of private investors, he purchased Grace Bioremediation Technologies from W.R. Grace & Co. and currently serves as CEO and Director of Technology for Adventus Americas, its successor. Dr. Seech also serves as an Associate Graduate Faculty at the Department of Environmental Biology, University of Guelph.

Jean Pare

Jean Pare, P.Eng., has a degree in Chemical Engineering from Laval University. He has been involved for the last 25 years in the evaluation, development, design, and promotion of both conventional and innovative environmental technologies. As Vice President with Chemco Inc., his responsibilities include the remediation design, technico-economical analysis and technology supply for chemical oxidation and reduction, soil washing, and enhanced bioremediation. Last year, he worked with over 400 sites applying his expertise to various types of organic and inorganic contaminants in soil and groundwater. He is also involved with many environmental organizations such as CLRA, CBN, ESAA, BCEIA and Reseau-Environnement where he is an active technical committee member and regular technical speaker.