
Introduction

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Biographical notes: Yildirim Omurtag holds engineering degrees from Iowa State University and the Middle East Technical University in Turkey. His PhD is in Industrial Engineering from Iowa State University. He has accumulated significant amounts of industrial experience in manufacturing in the USA and as a consultant all over the world. He has served as a Professor, a Department Head and a Dean in several universities and initiated programs in engineering, manufacturing, engineering management, environmental science and mathematics. His academic career spans over 35 years of service with distinction as recognised by several awards, medals and honorary fellowships. He is a licensed Professional Engineer with over six million dollars worth of grants and contracts in academia and over 100 publications and presentations.

Maria V. Kalevitch, PhD is a Head of the Science Department and Associate Professor of Science at Robert Morris University, Pennsylvania, USA. She has numerous years of teaching and research experience in the environmental area; her interest includes sustainable agriculture, bioremediation and plant biology. She is the author of more than 50 publications in leading American and international journals, including the coauthored book *Natural Growth Inhibitors and Phytohormones in Plant and Environment*. She is a full member of New York Academy of Sciences and a Full Member of American Society of Microbiologists.

I am very pleased to offer this special issue of the *International Journal of Environment and Pollution* with the general theme of 'Environmental Remediation and Development' for the attention of our readers. The first four papers deal with the monitoring and environmental remediation of water-related resources. In the first paper, an analytical model is shown to be quickly and cost-effectively capable of approximating realistic contaminant clean-up rates in heterogeneous aquifers. This is followed by the use of geo-statistics to evaluate the monitoring-well network of a TCE (trichloroethylene) plume using fewer wells without a significant decrease in predictability. The third paper describes a small-scale residential wastewater cleaning facility, using an experimental wetland site as a test-bed with very encouraging results. The fourth paper in this section describes an analytical method for measuring lead and beryllium in rainwater samples to be used in pollutant transport studies.

The next five papers deal with fabricated soils and their importance in environmental remediation. The first paper in this section explains the role of fabricated soils for landscape restoration through a public-private partnership. Using fabricated soils as topsoil to allow ground-cover plants and grass to grow on old industrial sites is discussed

and documented. The next two papers describe studies of bacterial and fungal activity in fabricated soils, as it may be applicable in western Pennsylvania, where loss of topsoil through erosion is evident at many former industrial sites. The fourth paper provides important insights into the role of peroxidase (POD) and polyamine (PA) in protecting plants against injury by oxidative stressors in potassium-deficient soils. The authors show that PODs and PAs may be the stress-adaptation elements in plants growing under these conditions. The last paper in this area shows that the use of auxin analogues as regulators for potato plant growth and productivity with no harm to mankind and the environment may open the possibility of increasing yield while protecting the environment.

The final two papers in this special issue deal with the topic of recovering coal-bed methane from deep unmineable coal seams and carbon sequestration. The environmental impact of this process on trace elements is dealt with by the last paper in a seamless fashion. These two papers make a strong case for considering the environmental effects of carbon sequestration in such environments.

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