

Practical Handbook Of Soil Vadose Zone And Ground Water Contamination Assessment Prevention And Remediation Second Edition

Groundwater is Africa's most precious natural resource, providing reliable water supplies for many people. Further development of groundwater resources is fundamental to increasing access to safe water across the continent to meet coverage targets and reduce poverty. There is also an increasing interest in the use of groundwater for irrigated agriculture as the climate becomes more variable. Sustainable development of the resource is not a trivial task and depends crucially on an understanding of the hydrogeology and people with the skills to make informed decisions on how groundwater can best be developed and managed in a sustainable fashion. Despite these obvious needs, however, little attention has been paid to the systematic gathering of information about groundwater resources in the past few decades, with the result that data are patchy, knowledge is limited and investment is poorly targeted. This book was written to start to bridge the knowledge gap. The 29 chapters are written by a combination of practitioners and researchers mainly from within Africa using experience from recent and ongoing projects. The chapters highlight the complexity and variety of issues surrounding the development and management of groundwater resources across Africa, and provide a snapshot of groundwater research and application in the early 21st century. Chapters range from strategic discussions of the role of groundwater in development and poverty reduction, to case studies on techniques used to develop groundwater, and modelling methods for managing groundwater systems.

Only book world-wide addressing this topic. The principal output of the European co-operative Action on "Water Movements in Road Pavements & Embankments". Provides unique guidance on assessing water condition and its affects on road performance. Provides unique guidance on assessing and ameliorating contaminant movement in pavement groundwater. Written by leading experts in Europe.

This book is for project engineers and managers, government staff and consultants to help avoid unforeseen archaeological problems in construction and development projects.

This book covers a broad group of wastes, from biowaste to hazardous waste, but primarily the largest (by mass and volume) group of wastes that are not hazardous, but also are not inert, and are problematic for three major reasons: (1) they are difficult to manage because of their volume: usually they are used in civil engineering as a common fill etc., where they are exposed to environmental conditions almost the same way as at disposal sites; (2) they are not geochemically stable and in the different periods of environmental exposure undergo transformations that might add hazardous properties to the material that are not displayed when it is freshly generated; (3) many designers and researchers in different countries involved in waste management are often not aware of time-delayed adverse environmental impact of some large-volume waste, and also do not consider some positive properties that may extend the area of their environmentally beneficial application.

Contains approximately 20,000 mostly English language sources for academic libraries of all sizes.

Traditionally, industrial hygienists and environmental engineers have been responsible for conducting chemical exposure assessments, however, this task is now becoming a team effort taken on by scientists, businessmen, and policymakers. Assessment of Chemical Exposures: Calculation Methods for Environmental Professionals addresses the expanding scope of exposure assessments in both the workplace and environment. It discusses the basics of gathering data and assessing exposure, including how to estimate exposure to chemicals using fundamental chemical engineering concepts. The book opens with a brief discussion on the history of exposure assessments and provides terms and nomenclature needed for communications between various disciplines involved in exposure assessments. The potential impact of chemical exposures on humans, the environment, and communities is discussed in detail. The book also addresses modeling source generation, pathway transport, and receptor impact. With the clear explanations presented in this text, even a novice will be able to practice the art of exposure assessment.

The design and construction of buildings is a lengthy and expensive process, and those who commission buildings are continually looking for ways to improve the efficiency of the process. In this book, the second in the Building in Value series, a broad range of topics related to the processes of design and construction are explored by an international group of experts. The overall aim of the book is to look at ways that clients can improve the value for money outcomes of their decisions to construct buildings. The book is aimed at students studying in many areas related to the construction industry including architecture, construction management, civil engineering and quantity surveying, and should also be of interest to many in the industry including project managers, property developers, building contractors and cost engineers. Environmental Monitoring theme is a component of Encyclopedia of Environmental and Ecological Sciences, Engineering and Technology Resources in the global Encyclopedia of Life Support Systems (EOLSS), which is an integrated compendium of twenty one Encyclopedias. The Theme on Environmental Monitoring is largely concerned with strategies in the preparation of environmental impact assessments, as well as in many circumstances in which human activities carry a risk of harmful effects on the natural environment.. All monitoring strategies and programmes on environment have reasons and justifications which are often designed to establish the current status of an environment or to establish trends in environmental parameters. The content of the Theme provides the essential aspects and a myriad of issues that are great relevance to our world with respect to environmental monitoring. These two volumes are aimed at the following five major target audiences: University and College Students Educators, Professional Practitioners, Research Personnel and Policy Analysts, Managers, and Decision Makers and NGOs

Horticultural Reviews presents state-of-the-art reviews on topics in horticultural science and technology covering both basic and applied research. Topics covered include the horticulture of fruits, vegetables, nut crops, and ornamentals. These review articles, written by world authorities, bridge the gap between the specialized researcher and the broader community of horticultural scientists and teachers.

Published in 1991, the first edition of The Practical Handbook of Ground-Water Monitoring quickly became the gold standard reference on the topic of ground-water monitoring. But, as in all rapidly evolving fields, regulations change, technology advances, methods improve, and research reveals flaws in prior thinking. As a consequence, books that document the state of the science, even widely acknowledged definitive works, become outdated and need to be rewritten periodically to stay current. Reflecting this and renamed to highlight its wider scope, The Practical Handbook of Environmental Site Characterization and Ground-Water Monitoring, Second Edition provides an updated look at the field. Completely revised, the book contains so much new information that it has doubled in size. Containing the most up-to-date information available, this second edition emphasizes the practical application of current technology. It covers environmental site characterization and ground-water monitoring in great detail, from the federal regulations that govern environmental investigations, to the various direct and indirect methods of investigating and monitoring the subsurface, to the analysis and interpretation of complex sets of environmental data. Cheaper, better, faster was the mantra of the 1990s, resulting in more streamlined approaches to both environmental site characterization and ground-water monitoring, but also pitting the application of good science against the mandate to get a project done as quickly and inexpensively

as possible. This book provides unbiased, technical discussions of the tremendously powerful tools developed in the last decade, helping environmental professionals strike a balance between good science and economics.

This book gathers the peer-reviewed proceedings of the 1st congress on Geoethics & Groundwater Management (GEOETH&GWM'20), held in Porto, Portugal, in an online format on 18-22 May 2020. Hosted in School of Engineering (ISEP), Polytechnic of Porto based on Porto city (a UNESCO World Heritage Site), the international conference focused on what has now been dubbed "hydrogeoethics", a novel transdisciplinary, scientific field integrating all dimensions of geoethics in groundwater science and practice. Given its scope, the book is of interest to all researchers and practitioners in the geosciences, hydrology, water resources, hydrogeology, natural resources management, environment, engineering, law, sociology, education, philosophy, culture, among others. This joint congress is the result of a collaborative agreement between the IAH (International Association of Hydrogeologists) and IAPG (International Association for Promoting Geoethics) and reflects the need for concerted actions to achieve sustainable development. The diversity, scale, significance and increasing magnitude of anthropogenic interactions with aquifers and groundwater, which often involve conflicting values or interests, call for analysis, discussions and decisions on the part of the agents involved, e.g. groundwater scientists, policymakers, managers, organisations, professionals and citizens. This approach calls for a responsible, sustainable and human approach to groundwater use and management. The groundwater community involved in the exploration and exploitation, use and management of this increasingly vital natural resource is becoming more and more aware that ethical issues pervade all our attitudes from concept to action and need to be addressed. Diverse values and cultures, science and education, law and policies, human and natural environments and the public and the economic sectors view groundwater and its value and/or role differently. The authors believe that in a globalised and interconnected world, common ground must be found in the interest of peace, human development and sustainability. The main topics covered here include: 1. Fundamentals of hydrogeoethics: cultures, principles and geoethical values on groundwater science and engineering 2. Lessons for a resilient and sustainable future with hydrogeoethics: case studies of geoethics in groundwater science-engineering, profession, and management 3. Scientific and humanistic components of hydrogeoethics in groundwater education and professional training 4. Socio-hydrogeology and ethical groundwater management 5. Geoethics of decision making under uncertainty and ethical issues in neglecting groundwater functioning 6. Groundwater: geological, legal, social, and ethical challenges of a unique natural resource

A compilation of all ASTM standards issued each year.

The new Manual of Environmental Microbiology will serve as a state of the art compendium of methods for the ever more important field of environmental microbiology. The book has major sections on general methods, water and public health microbiology, aquatic environments, subsurface and landfills, aerobiology, and biotransformation and biodegradation. An invaluable research tool!

A synthesis of years of interdisciplinary research and practice, the second edition of this bestseller continues to serve as a primary resource for information on the assessment, remediation, and control of contamination on and below the ground surface. Practical Handbook of Soil, Vadose Zone, and Ground-Water Contamination: Assessment, Prevention, and Remediation, Second Edition includes important new developments in site characterization and soil and ground water remediation that have appeared since 1995. Presented in an easy-to-read style, this book serves as a comprehensive guide for conducting complex site investigations and identifying methods for effective soil and ground water cleanup. Remediation engineers, ground water and soil scientists, regulatory personnel, researchers, and field investigators can access the latest data and summary tables to illustrate key advantages and disadvantages of various remediation methods.

This book is written in a simple, straightforward manner without complicated mathematical derivatives. Compiled by experienced practitioners, this guide covers topics such as basic principles of vadose zone hydrology and prevalent monitoring techniques. Case studies present actual field experiences for the benefit of the reader. The Handbook provides practitioners with the information they need to fully understand the principles, advantages, and limitations of the monitoring techniques that are available. The Handbook of Vadose Zone Characterization & Monitoring expands and consolidates the useful and succinct information contained in various ASTM documents, EPA manuals, and other similar texts on the subject, making it an invaluable aid to new practitioners and a useful reference for seasoned veterans in the field.

Environmental Medicine is an indispensable aid to the investigation, diagnosis and treatment of a wide variety of environmentally-acquired disorders. It brings into sharp focus the increasing importance of the practice of environmental medicine, drawing together the many different strands that make up this modern discipline, and putting topical and controversial subjects into evidence-based context. The editors and authors are all leading authorities in their respective fields and are drawn from a wide variety of sources, including government advisory bodies. They have put emphasis on the issues most relevant to contemporary practice, ensuring everyday relevance, while not neglecting less common conditions. Boxes and tables are used throughout for clarity and accessibility.

The practitioner or researcher often faces complex alternatives when selecting a method to characterize properties governing a soil process. After years of research and development, environmental and agricultural professionals now have an array of methods for characterizing soil processes. Well-established methods, however, may not be suitable for

This book addresses questions of relevance to governments and industry in many countries around the world, in particular concerning the link between contaminated-land-management programs and the protection of drinking water resources and the potential effects of climate changes on the availability of these same resources. On the "problem" side, it reports and analyzes methodologies and experiences in monitoring and characterization of drinking water resources (at basin, country and continental scales), pollution prevention, assessment of background quality and of impacts on safety and public health from land and water contamination and impacts of climate change. On the "solution" side, the book presents results from national cleanup programs, recent advances in research into groundwater and soil remediation techniques, treatment technologies, research needs and information sources, land and wastewater management approaches aimed at the protection of drinking water.

Every 3rd issue is a quarterly cumulation.

Protecting the global environment is a single-minded goal for all of us. Environmental engineers take this goal to task, meeting the needs of society with technical innovations. Revised, expanded, and fully updated to meet the needs of today's engineer working in industry or the public sector, the Environmental Engineers' Handbook, Second Edition is a single source of current information. It covers in depth the interrelated factors and principles that affect our environment and how we have dealt with them in the past, are dealing with them today, and how we will deal with them in the future. This stellar reference addresses the ongoing global transition in cleaning up the remains of abandoned technology, the prevention of pollution created by existing technology, and the design of future zero emission technology. Béla G. Lipták speaks on Post-Oil Energy Technology on the AT&T Tech Channel.

A complete guide to environmental remediation technologies, techniques, and regulations. This practical resource offers comprehensive coverage of the latest environmental codes alongside step-by-step remediation procedures. The book features information on all segments of the market, including water, air quality, and hazardous wastes, and enables you to ensure compliance with federal regulations. Handbook of Environmental Engineering fully explains engineering methods and technologies and directly connects them to applicable standards. You will get details on environmental tools such as sensors and monitoring, toxicity controls and treatments, and waste disposal. Measurement data, environmental impact assessments, and real-world examples demonstrate how to apply each technique in the field.

This new edition of 'Chemistry of the Environment' emphasises several major concepts proving to be essential to the practice of environmental chemistry at the beginning of the new millennium.

Designed to assist facility managers, state & tribal environmental managers, & the public to evaluate & choose protective practices for managing industrial waste in new landfills, waste piles, surface impoundments, & land application units. Identifies the components of a sound waste management system & the reasons why each is important. Also includes groundwater & air models, as well as other tools to help tailor waste management practices to a particular facility. This guidance reflects 4 underlying principles: protect human health & the environment; tailor management practices to risks; affirm state & tribal leadership; & foster a partnership.

Growing demands for water in many parts of the nation are fueling the search for new approaches to sustainable water management, including how best to store water. Society has historically relied on dams and reservoirs, but problems such as high evaporation rates and a lack of suitable land for dam construction are driving interest in the prospect of storing water underground. Managed underground storage should be considered a valuable tool in a water manager's portfolio, although it poses its own unique challenges that need to be addressed through research and regulatory measures.

This publication provides a structured approach to analyzing hazards to groundwater quality, assessing the risk they may cause for a specific supply, setting priorities in addressing these, and developing management strategies for their control. This book summarizes which pathogens and chemicals are relevant to human health, how they are transported, reduced, removed or retarded; provides practical guidance on characterizing the drinking-water catchment area and assessing potential health hazards; provides guidance on prioritising both hazards and management responses; presents key information on potential management actions and explains their integration into a comprehensive Water Safety Plan from catchment to consumer; and describes policy, land-use planning and implementation of pollution prevention, groundwater, with overviews of specific management approaches applicable to agriculture, sanitation, industry, mining, military sites, waste disposal and traffic.--Publisher's description.

Practical Handbook of Soil, Vadose Zone, and Ground-Water Contamination Assessment, Prevention, and Remediation, Second Edition CRC Press

An evolving, living organic/inorganic covering, soil is in dynamic equilibrium with the atmosphere above, the biosphere within, and the geology below. It acts as an anchor for roots, a purveyor of water and nutrients, a residence for a vast community of microorganisms and animals, a sanitizer of the environment, and a source of raw materials for construction and manufacturing. To develop lasting solutions to the challenges of balanced use and stewardship of the Earth, we require a fundamental understanding of soil—from its elastic, porous three-phase system to its components, processes, and reactions. Handbook of Soil Sciences: Properties and Processes, Second Edition is the first of two volumes that form a comprehensive reference on the discipline of soil science. Completely revised and updated to reflect the current state of knowledge, this volume covers the traditional areas of soil science: soil physics, soil chemistry, soil mineralogy, soil biology and biochemistry, and pedology. Contributors discuss the application of physical principles to characterize the soil system and mass and energy transport processes within the critical zone. They present significant advances in soil chemistry; describe how minerals are formed and transformed; and provide an introduction to the soil biota. They also examine geomorphology, land use, hydropedology, and subaqueous soils as well as the classification and digital mapping of soil. Critical elements addressed in each section include: Descriptions of concepts and theories Definitions, approaches, methodologies, and procedures Data in tabular and figure format Extensive references This cohesive handbook provides a thorough understanding of soil science principles and practices based on a rigorous, complete, and up-to-date treatment of the subject matter compiled by leading scientists. It is a resource rich in data, offering professional soil scientists, agronomists, engineers, ecologists, biologists, naturalists, and students their first point of entry into a particular aspect of the soil sciences.

This is the first complete edited volume devoted to providing comprehensive and state-of-the-art descriptions of science principles and pilot- and field-scaled engineering applications of nanoscale zerovalent iron particles (NZVI) for soil and groundwater remediation. Although several books on environmental nanotechnology contain chapters of NZVI for environmental remediation (Wiesner and Bottero (2007); Geiger and Carvalho-Knighton (2009); Diallo et al. (2009); Ram et al. (2011)), none of them include a comprehensive treatment of the fundamental and applied aspects of NZVI applications. Most devote a chapter or two discussing a contemporary aspect of NZVI. In addition, environmental nanotechnology has a broad audience including environmental engineers and scientists, geochemists, material scientists, physicists, chemists, biologists, ecologists and toxicologists. None of the current books contain enough background material for such multidisciplinary readers, making it difficult for a graduate student or even an experienced researcher or environmental remediation practitioner new to nanotechnology to catch up with the massive, undigested literature. This prohibits the reader from gaining a complete understanding of NZVI science and technology. In this volume, the sixteen chapters are based on more than two decades of laboratory research and development and field-scaled demonstrations of NZVI implementation. The authors of each chapter are leading researchers and/or practitioners in NZVI technology. This book aims to be an important resource for all levels of audiences, i.e. graduate students, experienced environmental and nanotechnology researchers, and practitioners evaluating environmental remediation, as

it is designed to involve everything from basic to advanced concepts.

The field of engineering is becoming increasingly interdisciplinary, and there is an ever-growing need for engineers to investigate engineering and scientific resources outside their own area of expertise. However, studies have shown that quality information-finding skills often tend to be lacking in the engineering profession. Using the Engineerin

This book offers a scientific overview of key findings in groundwater management set in context against the legislative milestones ensuing as a result of research and development activities.

Practical Handbook of Ground Water Monitoring covers the complete spectrum of state-of-the-science technology applied to investigations of ground water quality. The emphasis of the book is on the practical application of current technology, and minimum theory is discussed. The subject of ground water monitoring is covered in great detail, from the Federal regulations that require monitoring to the various direct and indirect methods of investigating the subsurface - to the analysis and interpretations of complex sets of water quality data. All aspects of ground water quality investigations, including site assessment techniques, health and safety considerations and equipment decontamination, are dealt with in a logical order that will allow the reader to follow along in the same thought progression as a field project. The experiences and expertise of more than 30 practicing scientists and engineers combine to make this book the most comprehensive reference compiled on the topic of ground water monitoring.

Despite having been published about two years ago for the first time, the continuous demand for this book encouraged me to prepare this revised and enlarged edition. Many parts of the text have been rewritten, type errors traced and corrected, and the bibliography largely modified to include many of the references published about the subject of soil pollution in the previous ten years. I should like to express my thanks to the staff of Springer-Verlag, Heidelberg, for their cooperative efforts in preparing this edition. I also would like to thank Mr. Michael Sidwell (B.A.) for the extreme but characteristic care with which he read and revised the proofs. I hope that, in this new edition, the book may continue to serve the needs of students and professionals alike interested in the subject of soil pollution. Ibrahim A. Mirsal Preface to the First Edition Whoever has enjoyed following the legendary duel between the Egyptian Pharaoh and his magicians (Alchemists) on one side, and Moses and his brother Aaron on the other, as is vividly narrated in the Bible, must have realised that people (at least those living at, or near the eternal battlefields of the Middle East) have always had knowledge about the terrible consequences of soil pollution by chemicals. This knowledge must have existed long before Moses and his Pharaoh. Nobody knows when people became aware of this, yet it must have been born in very early times, reaching back to the dawn of human conscious.

Human society depends on liquid freshwater resources to meet drinking, sanitation and hygiene, agriculture, and industry needs. Improved resource monitoring and better understanding of the anthropogenic threats to freshwater environments are critical to efficient management of freshwater resources and ultimately to the survival and quality of life of the global human population. This book helps address the need for improved freshwater resource monitoring and threat assessment by presenting current reviews and case studies focused on the fate and transport of contaminants in the environment and on the sustainability of groundwater and surface-water resources around the world. It is intended for students and professionals working in hydrology and water resources management.

This new edition adds several new chapters and is thoroughly updated to include data on new topics such as hydraulic fracturing, CO₂ sequestration, sustainable groundwater management, and more. Providing a complete treatment of the theory and practice of groundwater engineering, this new handbook also presents a current and detailed review of how to model the flow of water and the transport of contaminants both in the unsaturated and saturated zones, covers the protection of groundwater, and the remediation of contaminated groundwater.

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