

Landfill Leachate Treatment Using Sequencing Batch Reactor Process Improvement Of Sbr Performance

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Sustainable Environmental Engineering - Walter Z. Tang 2018-08-01

The important resource that explores the twelve design principles of sustainable environmental engineering Sustainable Environmental Engineering (SEE) is to research, design, and build Environmental Engineering Infrastructure System (EEIS) in harmony with nature using life cycle cost analysis and benefit analysis and life cycle assessment and to protect human health and environments at minimal cost. The foundations of the SEE are the twelve design principles (TDPs) with three specific rules for each principle. The TDPs attempt to transform how environmental engineering could be taught by prioritizing six design hierarchies through six different dimensions. Six design hierarchies are prevention, recovery, separation, treatment, remediation, and optimization. Six dimensions are integrated system, material economy, reliability on spatial scale, resiliency on temporal scale, and cost effectiveness. In addition, the authors, two experts in the field, introduce major computer packages that are useful to solve real environmental engineering design problems. The text presents how specific environmental engineering issues could be identified and prioritized under climate change through quantification of air, water, and soil quality indexes. For water pollution control, eight innovative technologies which are critical in the paradigm shift from the conventional environmental engineering design to water resource recovery facility (WRRF) are examined in detail. These new processes include UV disinfection, membrane separation technologies, Anammox, membrane biological reactor, struvite precipitation, Fenton process, photocatalytic oxidation of organic pollutants, as well as green infrastructure. Computer tools are provided to facilitate life cycle cost and benefit analysis of WRRF. This important resource:

- Includes statistical analysis of engineering design parameters using Statistical Package for the Social Sciences (SPSS)
- Presents Monte Carlo simulation using Crystal ball to quantify uncertainty and sensitivity of design parameters
- Contains design methods of new energy, materials, processes, products, and system to achieve energy positive WRRF that are illustrated with Matlab
- Provides information on life cycle costs in terms of capital and operation for different processes using MatLab

Written for senior or graduates in environmental or chemical engineering, Sustainable Environmental Engineering defines and illustrates the TDPs of SEE.

Undergraduate, graduate, and engineers should find the computer codes are useful in their EEIS design. The exercise at the end of each chapter encourages students to identify EEI engineering problems in their own city and find creative solutions by applying the TDPs. For more information, please visit www.tang.fiu.edu.

Solid Waste Engineering and Management - Lawrence K. Wang 2022-06-24

This book is the third volume in a three-volume set on Solid Waste Engineering and Management. It focuses on tourism industry waste, rubber tire recycling, electrical and electronic wastes, health-care waste, landfill leachate, bioreactor landfill, energy recovery, innovative composting, biodrying, and health and safety considerations pertaining to solid waste management.. The volumes comprehensively discuss various contemporary issues associated with solid waste pollution management, impacts on the environmental and vulnerable human populations, and solutions to these problems.

Technologies for the Treatment and Recovery of Nutrients from Industrial Wastewater - Val del Río, Ángeles 2016-10-21

The production of wastewater from various human and industrial activities has a harsh impact on the environment. Without adequate treatment, the disposal of this wastewater poses a threat to the quality of water globally. Technologies for the Treatment and Recovery of Nutrients from Industrial Wastewater investigates emergent research and best practices within the field of wastewater management.

Highlighting novel technological tools in wastewater treatment, effective nutrient removal technologies, and innovative solutions to quality water preservation practices, this book is a critical reference source for professionals, scientists, academics, and students.

Sustainable Practices for Landfill Design and Operation - Timothy G. Townsend 2015-07-16

Solid waste management is a global concern, and landfilling remains the predominant management method in most areas of the world. This book provides a comprehensive view of state-of-the-art methods to manage landfills more sustainably, drawing upon more than two decades of research, design, and operational experiences at operating sites across the world. Sustainable landfills implement one or multiple technologies to control and enhance the degradation of waste materials to realize a multitude of potential benefits during or shortly after the landfill's operating phase. This book presents detailed approaches in the development, design, operation, and monitoring of sustainable landfills. Case studies showcasing the benefits and challenges of sustainable landfill technologies are also provided to give the reader additional context. The intent of the book is to serve as a reference guide for regulatory personnel, a practical tool for designers and engineers to build on for site-specific applications of sustainable landfill technologies, and a comprehensive resource for researchers who are continuing to explore new and better ways to more sustainably manage waste materials.

Management of Pollutant Emission from Landfills and Sludge - Malgorzata Pawlowska 2014-04-21

This book gives an overview of recent findings on the mitigation of gas emission from landfills and sludge processing. Special attention is given to methane and the migration of POPs, heavy metal ions, ammonia and nitrate from landfills to the water-soil system and to the atmosphere. Strategies for mitigating the impact of pollution on ecosystems a

Sequencing Batch Reactor Technology - Peter A. Wilderer 2001-03-01

The report highlights various types of SBRs, design considerations and procedures, equipment required, and experiences gained from practical applications. This report will help both designers and operators of SBRs understand how to use this technology successfully. The focus is on the application of fill-and-draw, variable volume, periodically operated, unsteady-state principles to activated sludge systems. Research findings are presented, from both the laboratory and pilot and full scale SBRs. Also included is a description of trends for technological developments and a discussion of open questions regarding research, development, application, and operation. Contents Introduction Fundamentals of Periodic Processes General Overview of SBR Applications Design of Activated Sludge SBR Plants Equipment and Instrumentation Practical Experiences Evaluation of SBR Facilities in Australia Evaluation of SBR Facilities in the USA and Canada Evaluation of SBR Facilities in Germany Evaluation of SBR Facilities in France Evaluation of SBR facilities in Japan Scientific and Technical Report No. 10

Activated Sludge and Aerobic Biofilm Reactors - Marcos Von Sperling 2007-03-30

Activated Sludge and Aerobic Biofilm Reactors is the fifth volume in the series Biological Wastewater Treatment. The first part of the book is devoted to the activated sludge process, covering the removal of organic matter, nitrogen and phosphorus. A detailed analysis of the biological reactor (aeration tank) and the final sedimentation tanks is provided. The second part of the book covers aerobic biofilm reactors, especially trickling filters, rotating biological contractors and submerged aerated biofilters. For all the systems, the book presents in a clear and informative way the main concepts, working principles, expected removal efficiencies, design criteria, design examples, construction aspects and operational guidelines. About the series: The series is based on a highly acclaimed set of best selling textbooks. This international version is comprised by six textbooks giving a state-of-the-art presentation of the science and technology of biological wastewater treatment. Other titles in the series are: Volume 1: Waste Stabilisation Ponds; Volume 2: Basic Principles of Wastewater Treatment; Volume 3: Waste Stabilization Ponds; Volume 4: Anaerobic Reactors; Volume 6: Sludge Treatment and Disposal

Control and Treatment of Landfill Leachate for Sanitary Waste Disposal - Aziz, Hamidi Abdul 2015-12-02
Municipal solid waste (MSW) disposal is an ever-increasing problem in many parts of the world, especially in developing countries. To date, landfilling is still the preferred option for the disposal and management of MSW due to its low-cost operation. While this solution is advantageous from a cost perspective, it introduces a high level of potential pollutants which can be detrimental to the local environment. Control and Treatment of Landfill Leachate for Sanitary Waste Disposal presents research-based insights and solutions for the proper management and treatment of landfill leachate. Highlighting relevant topics on emerging technologies and treatment innovations for minimizing the environmental hazards of waste disposal, this innovative publication contributes to filling in many of the gaps that exist in the current literature available on leachate treatment. Waste authorities, solid waste management companies, landfill operators, legislators, environmentalists, graduate students, and researchers will find this publication beneficial to their professional and academic interests in the area of waste treatment and management.

Handbook of Research on Resource Management for Pollution and Waste Treatment - Affam, Augustine Chioma 2019-10-25

It is necessary to understand the extent of pollution in the environment in terms of the air, water, and soil in order for both humans and animals to live healthier lives. Poor waste treatment or pollution monitoring can lead to massive environmental issues, such as diminishing valuable resources, and cause a significant negative impact on society. Solutions, such as reuse of waste and sustainable waste management, must be explored to prevent these adverse effects. The Handbook of Research on Resource Management for Pollution and Waste Treatment is a collection of innovative research that examines waste and pollution treatment methods that can be adopted at local and international levels and examines appropriate resource management strategies for environmentally related issues. Featuring coverage on a wide range of topics such as soil washing, bioremediation, and runoff handling, this book is ideally designed for environmentalists, engineers, waste management professionals, natural resource regulators, environmental policymakers, scientists, academicians, researchers, and students seeking current research on viable resource management methods for the regeneration of their immediate environment.

Efficient Management of Wastewater from Manufacturing - Victor M. Monsalvo 2015-06-22
Efficient Management of Wastewater from Manufacturing is an accessible research compendium, highly useful for anyone involved with the phytosanitaries, food and beverage, pharmaceutical, or textile industries. The editor, Victor Monsalvo, is a well-respected expert in the field who has included many of his own studies. He has also enlisted articles from other researchers from around the world. Together, they offer a range of treatment methodologies for manufacturing wastewater, including anaerobic processes and catalyzation. They focus on advanced treatment processes that would improve current efficiency and reduced energy costs. Feasibility and potential problems are also thoroughly discussed, creating a realistic and practical research collection. Included within the book are chapters on the following topics: An overview of pesticide toxicity More efficient anaerobic treatments for agricultural wastewater Wastewater treatment methodologies for specific sectors of the food-production industry, including slaughterhouses, fish processing plants, dairies, fruit canning factories, and wineries Biological treatment systems for wastewater containing cosmetic and pharmaceutical chemicals and byproducts Improved methodologies for

removing dye from textile wastewater The range of topics will be of practical use to chemical, civil, and environmental engineers. Researchers at the graduate level will find here a wealth of studies that will prove fruitful for future investigation.

Anaerobic Digestion Processes - Nigel Horan 2018-04-18

This book presents new application processes in the context of anaerobic digestion (AD), such as phosphorus recovery, microbial fuel cells (MFCs), and seaweed digestion. In addition, it introduces a new technique for the modeling and optimization of AD processes. Chapters 1 and 2 review AD as a technique for converting a range of organic wastes into biogas, while Chapter 3 discusses the recovery of phosphorus from anaerobically digested liquor. Chapters 4 and 5 focus on new techniques for modeling and optimizing AD. Chapters 6 and 7 then describe the state of the art in AD effluent treatment. The book's final three chapters focus on more recent developments, including microbial fuel cells (MFCs) (Chapter 8), seaweed production (Chapter 9), and enzyme technologies (Chapter 10).

Civil and Environmental Engineering: Concepts, Methodologies, Tools, and Applications - Management Association, Information Resources 2016-01-31

Civil and environmental engineers work together to develop, build, and maintain the man-made and natural environments that make up the infrastructures and ecosystems in which we live and thrive. Civil and Environmental Engineering: Concepts, Methodologies, Tools, and Applications is a comprehensive multi-volume publication showcasing the best research on topics pertaining to road design, building maintenance and construction, transportation, earthquake engineering, waste and pollution management, and water resources management and engineering. Through its broad and extensive coverage on a variety of crucial concepts in the field of civil engineering, and its subfield of environmental engineering, this multi-volume work is an essential addition to the library collections of academic and government institutions and appropriately meets the research needs of engineers, environmental specialists, researchers, and graduate-level students.

Dye Biodegradation, Mechanisms and Techniques - Subramanian Senthilkannan Muthu 2021-10-27

An enormous amount of synthetic dyes is used annually in the textile, leather, plastics, paper, and dye industries due to their coloring properties. Although dyes give color to materials, they are prone to increase the level of pollution in the environment. The colored wastewater produced in industrial sectors is released into water bodies, posing threats to the ecosystem. To reduce the adverse effects of dyes in the environment, it is necessary to implement feasible and cost-effective strategies. "Dye Biodegradation Mechanisms and Techniques - Recent Advances" provides fundamental principles and pathways of bio-based mechanisms in dye removal. This edition firstly discusses dye classification and pollution, then concentrates on the application of fungi, mesophilic bacteria, microflora, and enzymes in dye degradation. This book also highlights the performance of sequential batch reactor systems, moving bed biofilm reactors, and hybrid bioreactors for dye biodegradation

Wastewater Treatment Engineering - Mohamed Samer 2015-10-14

This book provides useful information about bioremediation, phytoremediation, and mycoremediation of wastewater and some aspects of the chemical wastewater treatment processes, including ion exchange, neutralization, adsorption, and disinfection. Additionally, this book elucidates and illustrates the wastewater treatment plants in terms of plant sizing, plant layout, plant design, and plant location. Cutting-edge topics include wet air oxidation of aqueous wastes, biodegradation of nitroaromatic compounds, biological treatment of sanitary landfill leachate, bacterial strains for the bioremediation of olive mill wastewater, gelation of arabinoxylans from maize wastewater, and modeling wastewater evolution. *Advanced Oxidation Processes (AOPs) in Water and Wastewater Treatment* - Aziz, Hamidi Abdul 2018-08-03
Population growth and industrial development have increased the amount of wastewater generated by urban areas, and one of the major problems facing industrialized nations is the contamination of the environment by hazardous chemicals. Therefore, to meet the standards, suitable treatment alternatives should be established. Advanced Oxidation Processes (AOPs) in Water and Wastewater Treatment is a pivotal reference source that provides vital research on the current, green, and advanced technologies for wastewater treatment. While highlighting topics such as groundwater treatment, environmental legislation, and oxidation processes, this publication explores the contamination of environments by hazardous

chemicals as well as the methods of decontamination and the reduction of negative effects on the environment. This book is a vital reference source for environmental engineers, waste authorities, solid waste management companies, landfill operators, legislators, environmentalists, and academicians seeking current research on achieving sustainable management for wastewater treatment.

Selected Water Resources Abstracts - 1990

Waste Management: Concepts, Methodologies, Tools, and Applications - Management Association, Information Resources 2019-12-06

As the world's population continues to grow and economic conditions continue to improve, more solid and liquid waste is being generated by society. Improper disposal methods can not only lead to harmful environmental impacts but can also negatively affect human health. To prevent further harm to the world's ecosystems, there is a dire need for sustainable waste management practices that will safeguard the environment for future generations. Waste Management: Concepts, Methodologies, Tools, and Applications is a vital reference source that examines the management of different types of wastes and provides relevant theoretical frameworks about new waste management technologies for the control of air, water, and soil pollution. Highlighting a range of topics such as contaminant removal, landfill treatment, and recycling, this multi-volume book is ideally designed for environmental engineers, waste authorities, solid waste management companies, landfill operators, legislators, environmentalists, policymakers, government officials, academicians, researchers, and students.

Water Resources Management IX - C.A. Brebbia 2017-10-11

Containing papers from the ninth International Conference on Sustainable Water Resources Management, this book presents the work of scientists, practitioners and other experts regarding recent technological and scientific developments associated with the management of surface and sub-surface water resources. Water is essential for sustaining life on our planet, nevertheless its unequal distribution is a source of permanent conflict. It is predicted that population growth and irregular rainfall, due to climate change, may lead to more restricted access to water in certain regions of the world. This problem is made even more severe by human actions that can cause degradation to nature and the environment. These papers cover such topics as: Water management and planning; Water rights and accessibility; Water markets economics and policies; Climate change; Sedimental soil erosion; Irrigation; Water resources in arid regions; Ground water; Urban water management; Hydraulic engineering; Trans-boundary water management; Water, food and energy; Socio-economic aspects; Innovative technologies; Water and the community; Integrated water analysis; Wetlands as water sources.

Applied Water Science, Volume 2 - Inamuddin 2021-08-26

APPLIED WATER SCIENCE VOLUME 2 The second volume in a new two-volume set on applied water science, this book provides understanding, occurrence, identification, toxic effects and control of water pollutants in an aquatic environment using green chemistry protocols. The high rate of industrialization around the world has led to an increase in the rate of anthropogenic activities which involve the release of different types of contaminants into the aquatic environment. This generates high environmental risks, which could affect health and socio-economic activities if not treated properly. There is no doubt that the rapid progress in improving water quality and management has been motivated by the latest developments in green chemistry. Over the past decade, sources of water pollutants and the conventional methods used for the treatment of industrial wastewater treatment have flourished. Water quality and its adequate availability have been a matter of concern worldwide particularly in developing countries. According to a World Health Organization (WHO) report, more than 80% of diseases are due to the consumption of contaminated water. Heavy metals are highly toxic and are a potential threat to water, soil, and air. Their consumption in higher concentrations gives hazardous outcomes. Water quality is usually measured in terms of chemical, physical, biological, and radiological standards. The discharge of effluent by industries contains heavy metals, hazardous chemicals, and a high amount of organic and inorganic impurities that can contaminate the water environment, and hence, human health. Therefore, it is our primary responsibility to maintain the water quality in our respective countries. This book provides understanding, occurrence, identification, toxic effects and control of water pollutants in an aquatic environment using

green chemistry protocols. It focuses on water remediation properties and processes including industry-scale water remediation technologies. This book covers recent literature on remediation technologies in preventing water contamination and its treatment. Chapters in this book discuss remediation of emerging pollutants using nanomaterials, polymers, advanced oxidation processes, membranes, and microalgae bioremediation, etc. It also includes photochemical, electrochemical, piezoacoustic, and ultrasound techniques. It is a unique reference guide for graduate students, faculties, researchers and industrialists working in the area of water science, environmental science, analytical chemistry, and chemical engineering. This outstanding new volume: Provides an in-depth overview of remediation technologies in water science Is written by leading experts in the field Contains excellent, well-drafted chapters for beginners, graduate students, veteran engineers, and other experts alike Discusses current challenges and future perspectives in the field Audience: This book is an invaluable guide to engineers, students, professors, scientists and R&D industrial specialists working in the fields of environmental science, geoscience, water science, physics and chemistry.

Sanitary Landfill Leachate - Syed R. Qasim 2017-07-12

FROM THE PREFACE Sanitary landfills are the most widely utilized method of solid waste disposal around the world. With increased use and public awareness of this method of disposal, there is much concern with respect to the pollution potential of the landfill leachate. Depending on the composition and extent of decomposition of the refuse and hydrological factors, the leachate may become highly contaminated. As leachate migrates away from a landfill, it may cause serious pollution to the groundwater aquifer as well as adjacent surface waters. There is growing concern about surface and groundwater pollution from leachate. Better understanding and prediction of leachate generation, containment, and treatment are needed. This book contains a literature review of various methodologies that have been developed for prediction, generation, characterization, containment, control, and treatment of leachate from sanitary landfills. The contents of this book are divided into nine chapters. Each chapter contains theory and definition of the important design parameters, literature review, example calculations, and references. Chapter 1 is devoted to basic facts of solid waste problems current status and future trends towards waste reduction and recycling. Chapter 2 provides a general overview of municipal solid waste generation, collection, transport, resource recovery and reuse, and disposal options. The current status of sanitary landfill design and operation, problems associated with the landfilling, and future trends are presented in Chapter 3. Methods of enhanced stabilization, recycling landfill space, methane recovery, and above grade landfilling, and closure and post closure care of completed landfills are also discussed in detail. Chapter 4 provides a general overview of Subtitle D regulations and its impact upon sanitary landfilling practices. Chapter 5 is devoted entirely to moisture routing and leachate generation mechanisms. Examples of calculation pr

Biodegradation and Bioremediation of Polluted Systems - Rolando Chamy 2015-12-17

This book contains a collection of research works focused on the biodegradation of different types of pollutants, both in water and solids. The book is divided in three major sections: A) Biodegradation of organic pollutants in solids and wastewater, B) Biodegradation of complex pollutants, and C) Novel technologies in biodegradation and bioremediation.

Microbiotechnology Tools for Wastewater Cleanup and Organic Solids Reduction - Mayur B. Kurade 2021-03-25

Topic Editor Byong-Hun Jeon has patents related to the Research Topic. All other topic editors declare no competing interests with regard to the Research Topic subject.

Environmental Technologies to Treat Nitrogen Pollution - Francisco J. Cervantes 2009-06-30

Environmental Technologies to Treat Nitrogen Pollution provides a thorough understanding of the principles and applications of environmental technologies to treat nitrogen contamination. The main focus is on water and wastewater treatment, with additional coverage of leachates and off-gasses. The book brings together an up-to-date compilation of the main physical, chemical and biological processes demanded for the removal of nitrogenous contaminants from water, wastewater, leachates and off-gasses. It includes a series of chapters providing a deep and broad knowledge of the principles and applications required for the treatment of nitrogen pollution. Each chapter has been prepared by recognized specialists across the range of different aspects involved in the removal of nitrogenous contaminants from industrial

discharges. Environmental Technologies to Treat Nitrogen Pollution is the first book to provide a complete review of all the different processes used for the global management of nitrogen pollution. It also contains updated information about strategies to achieve nitrogen recovery and reuse in different industrial sectors. Several case studies document the application of different environmental technologies to manage nitrogen pollution. This book will be of interest to lecturers and graduate students in the following subject areas: Environmental Engineering, Environmental Biotechnology, wastewater treatment plant design, water pollution control, contaminants recovery and reuse. The book will also be an attractive reference for environmental engineering consultants.

Mechanism and Design of Sequencing Batch Reactors for Nutrient Removal - Derin Orhon 2005-05-31

The sequencing batch reactor (SBR) is perhaps the most promising and viable of the proposed activated sludge modifications today for the removal of organic carbon and nutrients. In a relatively short period, it has become increasingly popular for the treatment of domestic and industrial wastewaters, as an effective biological treatment system due to its simplicity and flexibility of operation. Mechanism and Design of Sequencing Batch Reactors for Nutrient Removal has been prepared with the main objective to provide a unified design approach for SBR systems, primarily based on relevant process stoichiometry. Specific emphasis has been placed upon the fact that such a unified design approach is also by nature the determining factor for the selection of the most appropriate cyclic operation scheme, the sequence of necessary phases and filling patterns for the particular application. The proposed basis for design is developed and presented in a stepwise approach to cover both organic carbon and nutrient removal, domestic and industrial wastewaters, strong and specific wastes. The merits of model simulation as an integral complement of process design, along with performance evaluation of SBR models are also emphasized. Scientific and Technical Report No. 19

Wastewater Engineering: Advanced Wastewater Treatment Systems - Hamidi Abdul Aziz 2014-04-01

As the global population grows and many developing countries modernize, the importance of water supply and wastewater treatment becomes a much greater factor in the welfare of nations. Clearly, in today's world the competition for water resources coupled with the unfortunate commingling of wastewater discharges with freshwater supplies creates additional pressure on treatment systems. Recently, researchers focus on wastewater treatment by difference methods with minimal cost and maximum efficiency. This volume of the Wastewater Engineering: Advanced Wastewater Treatment Systems is a selection of topics related to physical-chemical and biological processes with an emphasis on their industrial applications. It gives an overview of various aspects in wastewater treatments methods including topics such as biological, bioremediation, electrochemical, membrane and physical-chemical applications. Experts in the area of environmental sciences from diverse institutions worldwide have contributed to this book, which should prove to be useful to students, teachers, and researchers in the disciplines of wastewater engineering, chemical engineering, environmental engineering, and biotechnology. We gratefully acknowledge the cooperation and support of all the contributing authors.

Hazardous Industrial Waste Treatment - Lawrence K. Wang 2006-10-02

Increasing demand on industrial capacity has, as an unintended consequence, produced an accompanying increase in harmful and hazardous wastes. Derived from the second edition of the popular Handbook of Industrial and Hazardous Wastes Treatment, Hazardous Industrial Waste Treatment outlines the fundamentals and latest developments in hazardous waste

Toxicity of Landfill Leachates - Robert D. Cameron 1982

Environmental Processes and Management - Raj Mohan Singh 2020-02-17

This book presents an in-depth, science-based approach to applying key project-management and spatial tools and practices in environmental projects. Providing important data for those considering projects that balance social-economic growth against minimizing its ill-effects on planet Earth, the book discusses various aspects of environmental engineering, as well as formula and analytical approaches required for more informed decision-making. Beginning with a broad overview of the factors and features of environmental processes and management, the book then clearly details the general application of fundamental processes, the characteristics of the different systems in which they occur, and the way in

which these factors influence process dynamics, environmental systems, and their possible remedies. While primarily intended for professionals responsible for the management of environmental projects or interested in improving the overall efficiency of such projects, it is also useful for managers in the private, public, and not-for-profit sectors. Further, it is a valuable resource for students at both undergraduate and postgraduate levels, and an indispensable guide for anyone wanting to develop their skills in modern environmental management and related techniques.

Sustainable Development (2 Volume Set) - C.A. Brebbia 2015-10-06

This collection of research papers, presented at meetings organised by the Wessex Institute of Technology (WIT), concerns a variety of issues relating to the area of sustainable development. WIT has a long and very successful record of organising conferences on the topic of sustainability, which requires an interdisciplinary approach. Any sustainable solutions that are derived solely from the perspective of a single discipline may have unintended damaging consequences that create new problems. Thus effective sustainable solutions require the collaboration of scientists and engineers from various disciplines, as well as planners, architects, environmentalists, policy makers, social scientists, and economists. The contents of this book reflect that interdisciplinary approach, and include topics under the main areas of: Sustainable development and planning; Disaster management; Air pollution; Urban transport; Ecosystems and Water resources management.

Handbook of Industrial and Hazardous Wastes Treatment - Lawrence K. Wang 2004-06-29

Presenting effective, practicable strategies modeled from ultramodern technologies and framed by the critical insights of 78 field experts, this vastly expanded Second Edition offers 32 chapters of industry- and waste-specific analyses and treatment methods for industrial and hazardous waste materials-from explosive wastes to landfill leachate to w

Waste Water Treatment Technologies - Volume II - Saravanamuthu Vigneswaran 2009-09-25

Water and Wastewater Treatment Technologies theme is a component of Encyclopedia of Water 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 Water and Wastewater Treatment Technologies deals, in three volumes, and covers several topics, with several issues of great relevance to our world such as: Urban Wastewater Treatment; Characteristics of Effluent Organic Matter in Wastewater; Filtration Technologies in wastewater treatment; Air Stripping in Industrial Wastewater Treatment; Dissolved air flotation in industrial wastewater treatment; Membrane Technology for Organic Removal in Wastewater; Adsorption and Biological Filtration in Wastewater Treatment; Physico-chemical processes for Organic removal from wastewater effluent; Deep Bed Filtration: Modelling Theory And Practice ; Specific options in biological wastewater treatment for reclamation and reuse ; Biological Phosphorus Removal Processes For Wastewater Treatment ; Sequencing Batch Reactors: Principles, Design/Operation And Case Studies ; Wastewater stabilization ponds (WSP)for wastewater treatment; Treatment of industrial wastewater by membrane bioreactors; Stormwater treatment technologies; Sludge Treatment Technologies ; Wastewater Treatment Technology For Tanning Industry; Palm Oil And Palm Waste Potential In Indonesia ; Recirculating Aquaculture Systems - A Review ; Upflow anaerobic sludge blanket (UASB)reactor in wastewater treatment; Applied Technologies In Municipal Solid Waste Landfill Leachate Treatment; Water Mining: Planning and Implementation Issues for a successful project; Assessment methodologies for water reuse scheme and technology; Nanotechnology for Wastewater Treatment. These three 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.

Post Treatments of Anaerobically Treated Effluents - Vinay Kumar Tyagi 2019-06-15

The anaerobic process is considered to be a sustainable technology for organic waste treatment mainly due to its lower energy consumption and production of residual solids coupled with the prospect of energy recovery from the biogas generated. However, the anaerobic process cannot be seen as providing the 'complete' solution as its treated effluents would typically not meet the desired discharge limits in terms of residual carbon, nutrients and pathogens. This has given impetus to subsequent post treatment in order to meet the environmental legislations and protect the receiving water bodies and environment. This book

discusses anaerobic treatment from the perspective of organic wastes and wastewaters (municipal and industrial) followed by various post-treatment options for anaerobic effluent polishing and resource recovery. Coverage will also be from the perspective of future trends and thoughts on anaerobic technologies being able to support meeting the increasingly stringent disposal standards. The resource recovery angle is particularly interesting as this can arguably help achieve the circular economy. It is intended the information can be used to identify appropriate solutions for anaerobic effluent treatment and possible alternative approaches to the commonly applied post-treatment techniques. The succeeding discussion is intended to lead on to identification of opportunities for further research and development. This book can be used as a standard reference book and textbook in universities for Master and Doctoral students. The academic community relevant to the subject, namely faculty, researchers, scientists, and practicing engineers, will find the book both informative and as a useful source of successful case studies.

Handbook of Water Harvesting and Conservation - Saeid Eslamian 2021-03-01

Water harvesting is gaining more and more recognition as a sustainable and resilient water supply options. It is economically viable, socially compatible and environmentally friendly. Water harvesting has proven to be a robust solution to overcome or reduce water shortages all over the world. It is important to understand how to apply this practice in a sustainable and effective way to make full use of its potential in a world increasingly threatened by water scarcity. The Handbook of Water Harvesting and Conservation: Basic Concepts and Fundamentals is the most comprehensive, up-to-date and applied handbook on water harvesting and conservation yet published. The book's 30 chapters -- written by 84 outstanding international experts from approximately 20 selected countries faced by drought -- explore, critique and develop concepts and systems for water harvesting. The editors bring together many perspectives into a synthesis that is both academically based and practical in its potential applications. The Handbook of Water Harvesting and Conservation: Basic Concepts and Fundamentals is an important tool for education, research and technical works in the areas of soil, water and watershed management and is highly useful for drought strategy planning, flood management and developing techniques to adapt to climate change in urban, agricultural, forest and rangeland areas.

Pollution Control Technology for Leachate from Municipal Solid Waste - Zhao Youcal 2018-08-03

Pollution Control Technology for Leachate from Municipal Solid Waste explores the physical, chemical and biological factors that produce leachate and technological solutions for its control. The book introduces the integrated and pre-treatment leachate treatment processes that are necessary to deal with the variations of pollutants in leachate. Real world case-studies are provided to illustrate these treatment processes, along with leachate treatment engineering process design and the construction of municipal solid waste incinerator power plants. This book will be of particular interest to Civil, Chemical and Environmental Engineers, but will also be ideal for Environmental Scientists. Provides quantity and quality prediction models, along with properties of effluent concentrated leachate liquid Includes physical and chemical treatment processes for leachate, including ammonia nitrogen removal using struvite precipitation, crystal variation and microstructure of the struvite, etc. Covers leachate treatment engineering processes for design and construction of treatment plants

Advances in Wastewater Treatment - Giorgio Mannina 2018-10-15

Advances in Wastewater Treatment presents a compendium of the key topics surrounding wastewater treatment, assembled by looking at the future technologies, and provides future perspectives in wastewater treatment and modelling. It covers the fundamentals and innovative wastewater treatment processes (such as membrane bioreactors and granular process). Furthermore, it focuses attention on mathematical modelling aspects in the field of wastewater treatments by highlighting the key role of models in process design, operation and control. Other topics include: • Anaerobic digestion • Biological nutrient removal • Instrumentation, control and automation • Computational fluid dynamics in wastewater • IFAS systems • New frontiers in wastewater treatment • Greenhouse gas emissions from wastewater treatment Each topic is addressed by discussing past, present and future trends. Advances in Wastewater Treatment is a valid support for researchers, practitioners and also students to have a frame of the frontiers in wastewater treatment and modelling.

Advances in Membrane Technologies for Water Treatment - Angelo Basile 2015-02-28

Advances in Membrane Technologies for Water Treatment: Materials, Processes and Applications provides a detailed overview of advanced water treatment methods involving membranes, which are increasingly seen as effective replacements for a range of conventional water treatment methods. The text begins with reviews of novel membrane materials and advances in membrane operations, then examines the processes involved with improving membrane performance. Final chapters cover the application of membrane technologies for use in water treatment, with detailed discussions on municipal wastewater and reuse in the textile and paper industries. Provides a detailed overview of advanced water treatment methods involving membranes Coverage includes advancements in membrane materials, improvement in membrane performance, and their applications in water treatment Discusses the use of membrane technologies in the production of drinking water, desalination, wastewater treatment, and recovery

Advances in Waste Management - Ajay S. Kalamdhad 2018-06-22

This book presents some of the latest technologies in waste management, and emphasizes the benefits that can be gained from the use of recycled products. Divided into four sections, it deals with phytoremediation, aquatic weed management and the treatment of solid- and water-based wastes, such as those arising from agricultural, industrial and medical activities. With its special emphasis on the utilization of recycled products, this volume will be of interest to students, academicians, policy makers and others who have a practical and academic interest in dealing with the waste society generates.

Sewage and Landfill Leachate - Marco Ragazzi 2016-06-22

This title includes a number of Open Access chapters. This new book provides a multiperspective look at research into many elements of remediating environmental hazards connected to sewage and landfill leachate. Sewage and landfill leachate treatments include various processes that are used to manage and dispose of the liquid portions of solid waste. Untreated leachate and sewage are hazards to the environment if they enter the water system. The goal of treatment is to reduce the contaminating load to the point that leachate and sewage liquids may be safely released into groundwater, streams, lakes, and the ocean. Around the world, however, huge volumes of contaminated water from sewage and landfill leachate is still pumped directly into water systems, especially in the world's developing nations. Aside from the damage to marine environments and fisheries that this causes, it also jeopardizes the world's vulnerable water resources. This compendium volume explores effective sewage management, which is essential for nutrient recycling and for maintaining ecosystem integrity. It looks at a range of technologies that are available for the treatment of sewage and landfill leachate. The editor, himself a respected and experienced researcher in this field, includes chapters that cover biological treatments, reverse osmosis, and chemical-physical processes. This volume offers important research that will help us both assess our existing treatment facilities, as well as build better, more effective ones for the future.

Circular Economy in Municipal Solid Waste Landfilling: Biomining & Leachate Treatment - Pankaj Pathak 2022-09-13

This book will serve as a ready reckoner of contemporary information regarding municipal solid waste landfill biomining, treatment of landfill leachate and heavy metals in a single platform. The academicians, researchers, and students at master's and doctoral levels will be able to understand the current trends in municipal solid waste landfill operations, which will help in augmenting their research. Construction of new landfills requires huge monetary investments, which can be avoided if old landfills were bio-mined for resources and the space can be re-used as new landfills. Landfill leachate is a hazardous waste which needs proper treatment that could generate value-added products such as clean energy and biofertilizers. In this book, each chapter would provide the background, methodology, and relevant calculations for sustaining landfill operations. Also, the case studies based on best practices in municipal solid waste landfilling are discussed in this book.

Electro-Fenton Process - Minghua Zhou 2017-11-25

This volume discusses the theoretical fundamentals and potential applications of the original electro-Fenton (EF) process and its most innovative and promising versions, all of which are classified as electrochemical advanced oxidation processes. It consists of 15 chapters that review the latest advances and trends, material selection, reaction and reactor modeling and EF scale-up. It particularly focuses on the applications of EF process in the treatment of toxic and persistent organic pollutants in water and soil,

showing highly efficient removal for both lab-scale and pre-pilot setups. Indeed, the EF technology is now

mature enough to be brought to market, and this collection of contributions from leading experts in the field constitutes a timely milestone for scientists and engineers.