

CONTENTS

- vi Organizers
- viii Steering Committee
- viii Organizing Committee
- ix Technical Committee
- x Technical Reviewers
- xi Foreword
- xiii Preface
- xiv Acknowledgements

Chapter 1

Extremely Dry Settings

- 4 **Effluent treatment of flotation plants for water reuse** | Luiz A. C. Teixeira and Cristian Marquez S.
- 6 **Addressing complexity in water resources modeling for mining water supply in extremely dry areas** | Enrique Triana and Edwin “Chip” Paulson
- 8 **Defining the financial value of mine water security decisions in an arid multi-user basin** | Edwin “Chip” Paulson, Enrique Triana, John Chahbandour and Pranay Sanadhya
- 10 **Sewage water reuse: A contribution to water consumption diminution on sites with extreme thermal conditions** | Raúl Marino, Roberto Caso, Oscar Sagardía and Osvaldo Falcon
- 12 **Research on a polymer enhanced mineral liner, with a special focus on desiccation behavior** | Mike Naismith, Wolfgang Behrens and Jan Schröder
- 14 **Mine water management in dry areas of Chile** | Mohammed Abdul Samad and Sumeet Singh
- 16 **Dust mitigation: Challenges, technology and solutions** | Jeniffer Brown and Lisandro Palma
- 18 **Enviably water recovery in a desert environment: A case study** | James R. Obermeyer, Justo Enriquez and Tatyana G. Alexieva

Chapter 2

Extremely Wet Settings

- 22 **Development and assessment of water technologies in high rainfall mine sites** | Johann Poinapen
- 24 **Membrane based water treatment technology provides alternative water source and discharge solutions** | Tim Lilley
- 26 **Installation of infiltration gallery at Greens Creek Mine – Juneau, Alaska** | Thomas M. Hanna, Eric Sundberg and Gabriel Hayden
- 28 **General guidelines for designing stormwater retention ponds in the mining industry** | José Adriasola V. and Jorge Gironás L.
- 30 **Water management challenges and solutions at dry and wet mines** | Ian Hutchison, Tom Patterson and John Bennett
- 32 **Estimation of project design rainfall using a frequency-pairing approach** | Robert G. Millar
- 34 **Evaluation of the performance of frequency and chronological pairing techniques in synthesizing long-term streamflow** | Cameron Butt and Robert G. Millar

Chapter 3

Extremely Cold Settings

- 38 **Hydrological contribution from degrading permafrost and rock glaciers in the northern Argentinian Andes** | Lukas U. Arenson, Matthias Jakob and Pablo Wainstein
- 40 **Frozen dams in permafrost regions** | Megan Miller, John B. Kurylo and Maritz Rykaart
- 42 **Mine waste cover and water management upgrades in the Subarctic North** | Dustin Rainey, Jim Cassie, Gerry Ferris, Jeremy Valeriote and June Pollard
- 44 **A method for deriving sub-permafrost groundwater salinity and total dissolved solids** | Juliana M. Martin, Cameron J. Clayton and Brent Murphy
- 46 **Thermal performance of a lined tailings dam keyed into a permafrost foundation** | Peter Mikes, Jack Seto, Don Hayley and Cam Scott
- 48 **The Pebble Project: Using streamflow to quantify precipitation in an extreme northern environment** | Jaime Cathcart and Rod Smith
- 50 **Climate change: Insights to extremes in precipitation for mining activities** | Edward A. McBean

Chapter 4

Extremely Challenging Geochemistry

- 54 **Water management at the Navachab Gold Mine, Namibia, from 2000 to 2012, with a focus on groundwater chemistry** | Nick Steven, Marietjie Bell, Uwe Rentel, Bruce Eglington and Jodie Miller
- 56 **Cleaning regime for reverse osmosis membranes for feed water with high silica concentration** | Christian Dube
- 58 **Breach and decant of an acid mine lake by a eutrophic river: River water quality and limitations of use** | Clint D. McCullough, Elmien Ballot and Digby Short
- 60 **Long-term impact of acid mine drainage on surface water chemistry at the Smolník Pyrite Mine** | Peter Bajtoš, Peter Malík and Jaromír Švasta
- 62 **Acid mine drainage from Pan de Azúcar Mine, and possible arsenic input in Pozuelos Lagoon basin, Argentina** | Jesica Murray, Alicia Kirschbaum and Bernhard Dold
- 64 **Passive treatment of mining wastewater with a biochemical reactor at the Standard Mine Superfund site, Crested Butte, CO, USA** | Neal T. Gallagher, Eric P. Blumenstein and Thomas L. Rutkowski
- 66 **Wastewater treatment of high total dissolved solids and acidity at the Cerro de Pasco Mine site** | Thomas L. Rutkowski, Melissa Rhodes, Jessa Smith, Kevin Conroy, Mike Bratty and Miguel Cortes
- 68 **Mine rock drainage: From characterization to assessment of prevention alternatives** | David Arcos, Eduardo Ruiz, Wolf von Igel, Jorge Molinero and Jordi Guimerà
- 70 **Denitrification in a sawdust and sewage sludge barrier system in northern Sweden** | Roger B. Herbert and Harry Winbjörk

- 72 **Geotest®: Field geochemical cells for on-site acid mine drainage monitoring** | M. Carolina Soto, Natalia Farfán and Alberto Acuña
- 74 **Development of a hydrogeochemical model to support closure of tailings facilities at hyperarid mine sites** | Ryan T. Jakubowski and Cary L. Foulk
- 76 **Application of membrane distillation and solvent extraction for water and acid recovery from waste solutions** | Uchenna K. Kesieme, Mikel Duke, Nicholas Milne, Hal Aral and Chu Yong Cheng
- 78 **Modeling coupled hydro-geomechanical-geochemical behavior of leaching pads** | Mayu Tincopa, Albert Nardi, Gabriela Roman-Ross, Jorge Molinero, David Arcos, Eduardo Ruiz and Denys Parra
- 80 **DAZA: Chilean National Program for the Integrated Management of Acid Rock Drainage in Arid and Semiarid Zones** | M. Carolina Soto, Angela Oblasser and Natalia Farfán
- 82 **Extremely arsenic-rich, pH-neutral waters from the Giant Mine, Canada** | Heather Jamieson, Mackenzie Bromstad and D. Kirk Nordstrom
- 84 **A geochemical field barrel program to support waste planning, engineering and permitting needs at the Cerro Corona Mine, Peru** | Shannon C. Shaw, Julian Misiewicz, Laura Gutierrez and Luis Alberto Sanchez

Chapter 5

Extremely Complex Hydrogeological Conditions

- 88 **Hydraulic conductivity characterization of fractured rock at mine sites** | James R. Kunkel
- 90 **Impacts of scale on hydraulic characteristics in fractured rock systems: From cores to kilometers** | James R. Kunkel
- 92 **Large scale mine dewatering: A comparison of experiences from different parts of the world** | Richard E. Dixon
- 94 **Water balance in extreme conditions: Application to the Andean High Cordillera** | Jordan Clark and Jordi Guimerà
- 96 **Simulation of open pit flooding by incorporating non-linear boundary conditions in 3D hydrogeological models** | Salvador Jordana, Albert Nardi and Jorge Molinero
- 98 **Engineering in karst terrain** | Petar Milanović
- 100 **Joint use of natural and artificial tracers to determine infiltration processes and the hydrogeological functioning of a karst system** | Matías Mudarra-Martínez and Bartolomé Andreo-Navarro
- 102 **Design of a dewatering system for a geothermally influenced underground gold mine** | Roman Popielak, Joanna Moreno and Arlen Striegl

104 AUTHOR INDEX

