

MetPlant 2013

Plant Design & Operating
Strategies – World's Best Practice

Perth, Australia
15 – 17 July 2013

ISBN: 978-1-5108-2144-6

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2013) by Australian Institute of Mining & Metallurgy (AusIMM)
All rights reserved.

Printed by Curran Associates, Inc. (2016)

For permission requests, please contact Australian Institute of Mining & Metallurgy (AusIMM)
at the address below.

Australian Institute of Mining & Metallurgy (AusIMM)
P.O. Box 660
Carlton South Victoria 3053
Australia

Phone: 61 3 9658 6100
Fax: 61 3 9662 3662

publications@ausimm.com.au

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

CONTENTS

Keynote Papers

Developing a 'New and Innovative' Process Flow Sheet – Traps for all Players of all Ages	<i>J Canterford</i>	1
Is an 80th Percentile Design Point Logical?	<i>D David</i>	6
Mineral Project Management – A Perspective from Four Decades in the Industry	<i>J S Dunlop</i>	13
Geometallurgy – What do you Really Need to Know from Exploration through to Production?	<i>K Ehrig</i>	28
The Importance of Sampling in the Mineral Industry	<i>R J Holmes</i>	34
Project Delivery	<i>G Lane and E Skinner</i>	50
Is Bigger Better? Building Market Resilience into Process Plant Design	<i>P L McCarthy</i>	66

Bottom Line Opportunities

Off-Grid Solar in the Mining Sector – Can Renewable Energy Reduce your Operating Costs?	<i>C Chambers</i>	71
Advances in Thickener Flocculant Delivery	<i>A R Heath and I Arbuthnot</i>	86
Online Light Element Slurry Analysis	<i>M Kongas and K Saloheimo</i>	93
Review of Metal Accounting Methods for In-Process Metal Inventories	<i>L Lachance, S Gariépy, D Leroux and F Flament</i>	102
Polishing Filters for Mineral Processing Plants	<i>S Shipard</i>	118
Development of an On-Site Mineralogy Solution for Metallurgists	<i>D van der Wal, R Dobbe and K Moeller</i>	126

Comminution

The Selection Design and Application of Mill Liners for Large Wet Grinding Mills	<i>D Connelly and C Thompson</i>	133
Australian Innovations in High Pressure Grinding Rolls and Large Grinding Mill Manufacture	<i>E J Hofmann, J E Hofmann and A J Hofmann-Fritz</i>	141
Advanced Media-Free Fine and Ultra-Fine Grinding – The Kelsey Axial Displacement Mill	<i>J Kelly and C Kelsey</i>	152
VertiMill® – Development of Circuit Survey and Performance Evaluation Protocols	<i>S Palaniandy, M Powell, M Hilden, K Kermanshahi, J Allen and S Mwansa</i>	162

Pushing the Use of High Pressure Grinding Rolls in Magnetite Circuits	<i>B C Povey</i>	176
Stirred Milling Technology – A New Concept in Fine Grinding	<i>I Roitto, H Lehto, A Paz and M Åsthalm</i>	190
Hybrid Process Control Strategy for the Ok Tedi Mining Ltd Semi-Autogenous Grinding Mill #2 – A Comparative Analysis	<i>C Savage, R Rodriguez and G Metzner</i>	202
Commissioning and Operating an Autogeneous Mill at Karowe Diamond Mine	<i>L M van Niekerk, G N Ndlovu and N A Sikwa</i>	215

Design

Attrition Scrubbers	<i>W Baguley</i>	229
Mine Waste Risk Minimisation by Integrated Waste Management and Process Optimisation	<i>D Brett</i>	247
Sustainability, Made Easy – A Business Improvement Case Study	<i>G Corder, N Currey and G Becker</i>	259
A Review of Best Practice in Gravity Circuit Design and Operation	<i>A Giblett, A Bax, G Wardell-Johnson and W Staunton</i>	272
Energy Efficient Ball Mill Circuit – Equipment Sizing Considerations	<i>A Jankovic and W Valery</i>	285
Integrated Maintenance Services at the Los Pelambres Mine in Chile – The Lessons Learnt and Best Practices Developed from a Long-Term Sustainable Relationship	<i>J Misle, F Melo Miranda, L Avalos and M Ingwersen</i>	296

Flotation Design and Operations

The Application of High-Chrome Grinding Media at MMG Century Mine for Improved Grinding Media Consumption and Metallurgy Performance	<i>C Greet, D Obeng, J Kinal and P de Bosscher</i>	332
Adapting the Ernest Henry Mining Concentrator to Process the Mount Margaret Ores	<i>S Gunn, J Siliezar, D Brooks and T Perkins</i>	347
Low pH Trial in the Ernest Henry Mining Copper Rougher Flotation Circuit	<i>B Kirkwood, J Kinal, J Siliezar and H Sofatzis</i>	371
Advances in Coarse Particle Flotation – Copper and Gold	<i>J Kohmuench, H Thanasekaran and B Seaman</i>	378
Molybdenum Flotation Circuit and Flotation Cells	<i>D Meadows, D Jensen, F Traczyk, S Yu and L Riffo</i>	387
Flotation Energy Consumption and Opportunities for Improvement	<i>B Murphy</i>	399

FLSmidth Flotation Developments – Dorr Oliver Machines	<i>R Silva, K Caldwell, D Bell, T Olson and S Vianna</i>	413
Optimisation of the Prominent Hill Flotation Circuit	<i>P Woodward, N Muhamad and T Ly</i>	431
Gold Plant Optimisation		
Considerations for Effective Gold Process Development	<i>A Giblett, D Appelhans and R Dunne</i>	445
Carbon Management in a High Gold Price Environment	<i>S R La Brooy and J K Claflin</i>	455
Improvements in the Mercury Abatement and Process Efficiency of Adsorption, Desorption and Regeneration Gold Processing Operations	<i>M Lefler, T Weldon, C Barton and B Randall</i>	468
Martabe Overcomes the Challenges	<i>R Sherrit, H Levings, E McLean and M Hoey</i>	479
Pyrometallurgy		
The Whys and Wherefores of Penalty Elements in Copper Concentrates	<i>C Fountain</i>	502
Pyrometallurgical Process Solutions for Complex Raw Materials	<i>S Hughes</i>	519
Technology Selection for Removal of Contaminants from an Industrial Wastewater	<i>A Salokannel, L M Nevatalo, M Martikainen, T van der Meer and J McCulloch</i>	531
Reviews and Insights		
Achieving Success in Large-Scale, Remote Area Metallurgical Plant Projects	<i>T Hausler</i>	539
Mount Isa Mines Copper Concentrator – An Insight into Current and Historical Practice	<i>W Y Lui and P Radulovic</i>	553
The Implementation of Floatstar Grade-Recovery Optimisation Control Solutions using Blue Cube Online Grade Analysers on Industrial Flotation Circuits	<i>S M Mantsho, P Moswate, P Strobos and D Phillpotts</i>	575
Iron Ore Beneficiation in Australia	<i>D J Miller</i>	583
Fine and Coarse Iron Ore Beneficiation – An Evaluation into Global Technologies and Techniques	<i>L M van Niekerk</i>	584
Author Index		599