

# URANIUM 2017 INTERNATIONAL CONFERENCE

## FINAL PROGRAMME

### 11 September 2017

08:00–16:00 **Alan Taylor Workshop**  
 07:00–13:00 **Technical Visit: Bannerman Geological Visit**  
 17:00–19:00 **Welcome Cocktail**

08:25–08:40 **Ministry**  
 08:40–08:55 H. Mbako, *Chairman of the Namibian Uranium Association (NUA)*  
 08:55–09:10 T. Tjivikua (*VC of NUST*)  
 09:10–09:50 **Keynote: Remaining uranium resources: where and how much?**  
 M. Fairclough, *International Atomic Energy Agency, Austria*  
 09:50–10:30 **Keynote: Uranium in Namibia–Past, present and the future**  
 W. Duvenhage, *Rössing Uranium Ltd, Namibia*  
 10:30–11:00 **Mid-morning refreshments**

### Day 1 – 12 September 2017

07:30–08:00 **Welcome and Registration**  
 08:00–08:05 **Safety Briefing**  
 08:05–08:10 **Conference Chairperson Welcome**  
 D. Groot  
 08:10–08:25 **SAIMM Presidential Address**  
 S. Ndlovu

#### Extraction flowsheets

#### Fuel cycle and waste

11:00–11:25

**Trends, developments, and opportunities in the extraction and recovery of uranium**  
 A. Taylor, *ALTA Metallurgical Services, Australia*

**Influence of radiation on a polypropylene membrane contactor used during membrane-based solvent extraction of uranium from nitric acid solutions**  
 M. Fourie\*†, W.C.M.H. Meyer\*, D.J. van der Westhuizen†, and H.M. Krieg†, *\*South African Nuclear Energy Corporation SOC Ltd (Necsa)\*, and †North-West University, South Africa*

11:25–11:50

**Uranium circuit development for a West African polymetallic deposit**  
 A.J. du Toit and S.J. Archer, *DRA Projects, South Africa*

**Removal of uranium at the low ppm or ug/L range – a possible solution to decontamination of active or depleted mine site effluents**  
 J. Bester and S. Delameilleure, *Dow Water & Process Solutions, Netherlands and France*

11:50–12:15

**Geometallurgy of gangue mineral–reagent interaction and implications for uranium heap leaching**  
 R.J. Bowell, *SRK Consulting, United Kingdom*

**Behaviour and fate of uranium in high-level nuclear waste processing system**  
 J. Addai-Mensah\*† and H. Musiyarira\*, *\*Namibia University of Science Technology, Namibia, and †University of South Australia, Australia*

12:15–12:40

**SOMAIR : Nearly 50 years of uranium production in Niger**  
 N. Durupt\*, J.-J. Blanvillain\*, A.-N. Garba Illout†, M. Davrinche†, T. Mohamadou Moussa†, and K. Mohamed†, *\*Areva Mines, Mining Innovation Center, France, †Somair, Arlit, Niger*

**The development of a magnesium potassium phosphate geopolymer at different sintering temperatures for the stabilization of uranium wastes**  
 S.M.M. Nelwamondo\*†, W.C.M.H. Meyer\*, H. Krieg†, and J. Markgraaff†, *\*South African Nuclear Energy Corporation SOC Ltd (Necsa) and †North West University, South Africa*

12:40–13:40

**LUNCH**

#### Mining

#### Separation and purification

13:40–14:05

**Adjustment options in mine planning to survive low commodity prices - uranium**  
 L. Madziwa, T. Ipinge, J. Addai-Mensah, and T. Hollenberg, *Namibia University of Science and Technology, Namibia*

**Effect of impurities on the selective extraction and recovery of uranium from nuclear conversion plant waste**  
 M. Potgieter\*†, J.C. Barry\*, D.J. van der Westhuizen†, and H.M. Krieg†, *\*South African Nuclear Energy Corporation SOC Ltd (Necsa), †North West University, South Africa*

|             | Mining  | Separation and purification  |
|-------------|---|--|
| 14:05–14:30 | <b>Implementation of drilling and blasting improvements in calcrete formations at Husab Uranium Mine</b><br>T. Aipanda and S. Nakumbwata, <i>Swakop Uranium, Namibia</i><br>(PRESENTATION ONLY)   | <b>Uranium recovery from sulphuric acid eluates using strong-acid cation resins</b><br>J. Bester*, M.A. Pérez-Maciá*, S. Corbet*, S. Delameilleure*, and E. Zaganiaris†, * <i>Dow Water and Process Solutions, the Netherlands and France</i> and † <i>Consultant, France</i>  |
| 14:30–14:55 | <b>Ventilation considerations in underground uranium mines</b><br>M. Pillalamarry, <i>Namibia University of Science and Technology, Namibia</i> (PRESENTATION ONLY)   | <b>Recovery of uranium from sulphate media using a weakly basic anion exchange resin: effect of chloride on column loading</b><br>J.T.M. Amphlett*, C.A. Sharrad*, R.I. Foster*†, and M.D. Ogden‡, * <i>University of Manchester, United Kingdom</i> , † <i>Korea Atomic Energy Research Institute, Republic of Korea</i> , and ‡ <i>The University of Sheffield, United Kingdom</i> |
| 14:55–15:20 | <b>The impact of depressed uranium prices on the Namibian uranium sub-sector</b><br>P. Shava and L. Madziwa, <i>Namibia University of Science and Technology, Namibia</i>   | <b>Uranium recovery from high chloride arid regions – a cost trade-off study of treated water vs. saline water</b><br>E.L. Forner*, S.J. Archer*, V.E. Coetzee*, K. Soldenhoff†, and J. Quinn‡, * <i>DRA Projects, South Africa</i> , and † <i>ANSTO Minerals, Australia</i>   |
| 15:20–15:45 | <b>AFTERNOON REFRESHMENTS</b>   |  |
|             | Environment   | Radiation  |
| 15:45–16:10 | <b>Uranium recovery from acid mine drainage-polluted water</b><br>V. Yahorava*, M. Kgarira*, and J. Wyethe†, * <i>Mintek and †Jacolien Wyethe Consulting, South Africa</i>  | <b>Radiation-related compliance – a practitioner's perspective</b><br>D. von Oertzen, <i>VO Consulting, Namibia</i>  |
| 16:10–16:35 | <b>Water management in Namibian uranium mines</b><br>H. Musiyarira*, D. Groot*†, K. Harding‡, and D. Tesh*, * <i>Namibia University of Science and Technology, Namibia</i> , † <i>University of Pretoria</i> , and ‡ <i>University of the Witwatersrand, South Africa</i> | <b>Monitoring of dust emission at Rössing Uranium</b><br>B. Schleicher, <i>Rössing Uranium Limited, Namibia</i>  |
| 16:35–17:00 | <b>Challenges and opportunities for sustainable rehabilitation of uranium mines in Namibia</b><br>T. Ipinge, L. Madziwa, T. Hollenberg, and J. Addai-Mensah, <i>Namibia University of Science and Technology, Namibia</i>   | <b>Radiation exposures at uranium mines—what are the risks?</b><br>G. von Oertzen, <i>Rössing Uranium Limited, Namibia</i>   |
| 17:00–17:15 | <b>Day 1 Conference Close</b>   |  |
| 18:30       | <b>Dinner Transfer to leave the hotel</b>   |  |
| 19:00–22:30 | <b>Conference Dinner</b>  |  |

## Day 2 – 13 September 2017

|             |  |
|-------------|--|
| 07:30–08:00 | <b>Welcome and Registration</b>  |
| 08:00–08:05 | <b>Safety Briefing</b>   |
| 08:05–08:10 | <b>Conference Chairperson Welcome</b><br>D. Groot  |
| 08:10–08:50 | <b>Keynote: The Namibian Uranium Association, the environment, and sustainable development</b><br>G.I.C. Schneider, <i>Namibian Uranium Institute, Namibia</i>           |
| 08:50–09:30 | <b>Keynote: Will fission Mo-99 production be seriously impacted through other efforts to diversify the supply of Mo-99?</b><br>J.R. Zeevaart, <i>NECSA, South Africa</i> |
| 09:30–09:40 | <b>Sponsor Presentation: Protea Chemicals</b>  |
| 09:40–10:10 | <b>Mid-morning refreshments</b>  |

### Mineralogy and leaching

### Mineral processing

|             |   |   |
|-------------|---|---|
| 10:10–10:35 | <b>Nanofiltration technology for reagent recovery</b><br>M. Peacock*, S. McDougall*, P. Boshoff†, D. Butcher†, M. Ford†, S. Donegan‡, and D. Bukunkwe‡, *BMS Engineers, †Paladin Energy Ltd, Australia, and ‡Langer Heinrich (Pty) Ltd, Namibia (PRESENTATION ONLY) | <b>Determining uranium mineral compositions by electron probe microanalysis</b><br>G.G. Freemantle*, J.A. Kinnaird*, and G. Costin†, *University of the Witwatersrand*, South Africa, and †EPMA Lab, Rice University, USA |
| 10:35–11:00 | <b>Minimizing reagent and utility consumption in uranium agitation and heap leaching operations</b><br>G. Miller†, S. Archer*, and J. Scheepers*, †Miller Metallurgical International, Australia, and *DRA Global, South Africa                                     | <b>Innovative technologies for uranium processing – impact-based real-time particle size measurement and non-invasive flow measurement</b><br>C.V. O'Keefe and R. Maron, <i>CiDRA Minerals Processing, USA</i>            |
| 11:00–11:25 | <b>Investigation of the impact of uranium mineralogy on alkaline leaching conditions</b><br>S. Burling, M. Maley, and R. Ring, <i>ANSTO Minerals, Australia</i>   | <b>U-pgrade™ a technological breakthrough for surficial uranium ores</b><br>M.P. Hill, <i>Marenica Energy Limited, Australia</i>  |
| 11:25–11:50 | <b>Modelling of uranium leach kinetics</b><br>B. Sililo and D. Groot, <i>Namibia University of Science and Technology, Namibia</i>  | <b>The separation of carbonates from uranium by flotation for the Karoo sandstone deposits in South Africa</b><br>S. Pillay and M. Dlame, <i>Mintek, South Africa</i>   |
| 11:50–12:15 | <b>Heap leaching of uranium: the good, the bad and the ugly</b><br>J. Petersen, <i>University of Cape Town, South Africa</i><br>(PRESENTATION ONLY)   | <b>Flotation of gypsum and calcite from Trekkopje uranium ore</b><br>C. Magombedze*, L. Eimann†, A. Handuba*, and J. Indongo*, *Namibia University of Science and Technology and †AREVA Resources, Namibia                |
| 12:15–12:40 | <b>McClellan Lake mill leaching circuit upgrades</b><br>W. McCombe*, L. Nightingale-Mercer*, L. Zunti*, G. Remple†, and M. Bernardin†, *Hatch Ltd and †AREVA Resources Canada Inc, Canada   | <b>Evaluation of polythionate formation during uranium recovery from sulphide flotation concentrate</b><br>V. Yavorava and V. Bazhko, <i>Mintek, South Africa</i>   |

12:40–13:40

LUNCH

|             | Processing   | Ion exchange   |
|-------------|--|--|
| 13:40–14:05 | <b>Rejuvenating the giant thickeners of yesteryear</b><br>A. Krassnokustki, <i>Krassno Consulting, South Africa</i>  | <b>Influence of phosphates on the metallurgical flow sheet development for the Mkuju River uranium project</b><br>J. Scheepers, S.J. Archer, and A. Naidoo, <i>DRA Projects, South Africa</i>  |
| 14:05–14:30 | <b>Optimization of the Rössing counter current decantation circuit for high-calc ore</b><br>C.J. Anderson*, S. Rabie†, and N. Jansen van Rensburg‡, <i>*Hatch Africa, †Vietti Slurrytec, South Africa, and ‡Rio Tinto, Australia</i> | <b>Selective removal of aluminium from both the cladding and the core of LEU fuel plate</b><br>J.S. Gama*, J.C. Barry*, and P.L. Crouse†, <i>*The South African Nuclear Energy Corporation SOC Limited (Necsa) and †University of Pretoria, South Africa</i> |
| 14:30–14:55 | <b>Advances in uranium precipitation</b><br>G. Jobling, <i>Adelaide Control Engineering Pty Ltd, Australia</i>   | <b>Batch adsorption studies of uranium onto Amberlite IRC-50 and Purolite A500 resins</b><br>K.P. Skolo*, J.C. Barry*, and P.L. Crouse†, <i>*South African Nuclear Energy Corporation SOC Ltd (Necsa) and †University of Pretoria, South Africa</i>          |

14:55–15:05 **Conference Close**

15:05 **Afternoon refreshments**

#### Poster Presentations

##### **Dissolver pot design for uranium extraction from radioactive waste from in the production of molybdenum-99**

M.H. Wichers, J.N. Cilliers, A. Cilliers, and B. Mastoroudes, *North-West University, South Africa*

##### **Nuclear encapsulation and disposal - RF oven system design**

P.J. Van Loggerenberg, J.N. Cilliers, A. Cilliers, and B. Mastoroudes, *North-West University and South African Nuclear Energy Corporation (NECSA), South Africa*

##### **NECSA purification and encapsulation process: control system re-evaluation and redundant control system design**

M.P. McIntyre, J. N.Cilliers, A. Cilliers, and B. Mastoroudes, *North-West University and South African Nuclear Energy Corporation (NECSA), South Africa*

##### **Purification and encapsulation of nuclear waste: frame and tubing remover**

A.Y. Botha, J.N. Cilliers, A. Cilliers, and B. Mastoroudes, *North-West University and South African Nuclear Energy Corporation (NECSA), South Africa*

##### **Solvent extraction of uranium from alkaline solutions in a hot cell**

N.D. Mokhine and M. Mathuthu, *North-West University, South Africa*

#### Technical Visits

##### **Thursday 14 September 2017**

Rössing Uranium—the longest-running uranium mine in the world and third-largest open-cast mine

##### **Friday 15 September 2017**

Langer Heinrich—was the first new uranium mine in 20 years on opening in 2007 and the lowest-cost open-pit mine in 2015