



INTERNATIONAL SEMINAR ON BAUXITE RESIDUE (RED MUD)

OCTOBER 17-19, GOA, INDIA

SECOND CIRCULAR



IN COOPERATION WITH HINDALCO, INDIA

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| Dr. Frank Feret | Senior Consultant Analytical Technologies, Rio Tinto Alcan, Canada |
| Dr. Ashok Nandi | Executive Secretary, ICSOBA, India |

Dear Colleagues,

The International Committee for the Study of Bauxite, Alumina and Aluminium (ICSOBA) is pleased to present the second circular for the International Seminar on Bauxite Residue (Red Mud) to be held in Goa, India during 17 – 19 October 2011. This document presents the Seminar program, including some 40 presentations by speakers, who reflect the truly international character of ICSOBA.

Keeping in view the increasing importance of the environmental impact of industry waste and the legislations governing them, it has become inevitable to take into consideration the aftermath of industrial activities. Safe disposal of industrial waste is of utmost importance for every industry and the aluminium industry is not an exception. Alumina refineries world over presently generate more than 100 million tons of red mud per annum, which is likely to increase with the setting up of new production facilities and decreasing ore quality. Less than 5% of red mud is being utilized in the world with the remainder disposed in storage areas. These red mud storage areas are a severe potential environmental hazard if not properly designed and managed.

Due to the recent dam failure of a red mud storage pond in Hungary, “Bauxite residue storage and potential utilization of red mud as feedstock” has attracted worldwide attention. The ICSOBA 2011 seminar has been conceived as a result of this mishap. The Seminar brings together experts from academia, industry, government and other stakeholders from all over the world.

Aims and Objectives

- To review bauxite residue characterisation, and the present status of processing, handling, storage, treatment and utilization in various alumina refineries of the world.
- To discuss environmental and safety considerations for storage of mud and rehabilitation of storage areas.
- To highlight the best options for mud handling, storage, treatment and utilization etc. for existing and future alumina refineries.
- To discuss promising research developments in the field of safe storage of red mud, its treatment and its utilization.

We invite you, dear colleagues, to participate in the International Seminar "ICSOBA – 2011". The Seminar will provide an excellent opportunity to meet and interact with International Experts, Scientists, Engineers, Entrepreneurs and Representatives of alumina producers, companies dealing with red mud, R&D institutes and end users world over. Please join us in making the event a grand success.

An **optional Technical Excursion** will be arranged to the rehabilitated red mud storage areas of HINDALCO in Belgaum, India.

We look forward to seeing you in Goa, India in October 2011.

Best Regards,
Roelof Den Hond
President ICSOBA

THE PROGRAM

The current status of the program is shown below. Please look at ICSoba's website <http://icsoba.org> for updates.

SUNDAY, 16 OCTOBER 2011

16.00 Registration and Welcome drinks

MONDAY, 17 OCTOBER 2011

8.00 WELCOME ADDRESS

Roelof Den Hond, *President*, ICSoba

Ashok Nandi, *Executive Secretary*, ICSoba

8.40 KEYNOTE PRESENTATIONS

The progress on treatment of bauxite residue in China

Dr. Li Wangxing, *President*, Zhengzhou Research Institute of Chalco, China

Bauxite residue management - A global approach to managing a potential significant risk

Ron Knapp, *Secretary General*, International Aluminium Institute, UK

SESSION 1. BAUXITE RESIDUE CHARACTERISATION

9.20 **The red mud accident in Ajka (Hungary): Characterization and potential health effects of fugitive dust**

Andras Gelecser, University of Pannonia, Veszprém, Hungary

9.40 **Micron-scale characterization of minerals, metals and processes occurring in bauxite residue**

Markus Gräfe, CSIRO, Australia

10.00 *Coffee break*

10.40 **Analysis of red mud samples by X-ray diffraction using synchrotron radiation**

F. Feret, Rio Tinto Alcan, Canada

11.00 **Rapid determination of residual alkalinity in bauxite residue sand and mud**

Mark Dobrowolski, University of Western Australia, Australia

11.20 **Chemical and mineralogical indicators of pedogenesis within residue storage areas**

Talitha Santini, University of Western Australia, Australia

11.40 **Sea water neutralisation – A 1st step in the production of a plant growth medium from bauxite refining residue**

Neal Menzies, University of Queensland, Australia

12.00 **Material composition of bauxite concentrates from Gia Nghia mine and general review of effects on the red mud settling process**

Do Hong Nga, National Research Institute for Mining and Metallurgy Science and Technology, Vietnam

12.20 *Lunch*

SESSION 2. BAUXITE RESIDUE PROCESSING, STORAGE AND STORAGE AREA REHABILITATION

13.30 **Design aspects of bauxite residue storage areas**

Roelof Den Hond, Alcor, The Netherlands

- 13.50 **Overall design alignment for red mud disposal systems**
Erik Vlot, WeirMinerals – GEHO, The Netherlands
- 14.10 **Red mud dewatering with Vacuum Drum Filters and Hi-Bar Filtration**
Jürgen Hahn, Bokela, Germany
- 14.30 **Feedwell design for alumina thickeners and clarifiers - where to next?**
Michael Missalla, *Vice President – Light Metals / Fluidised Beds*, Outotec, Germany
- 14.50 **Application of modern flocculants in mud washing circuits**
Alex Aboagye, Nalco, Australia
- 15.10 **The red mud pond dam failure at Ajka (Hungary) and subsequent developments**
George Bánvölgyi, Bán-Völgy Limited Partnership, Hungary
- 15.30 *Tea break*
- 16.00 **Converting from wet to dry mud storage in Suriname**
Shyam Mahesh, Bauxite Institute Suriname, Surinam
- 16.20 **A review of Alunorte's bauxite residue disposal concept**
Joaquim Ribeiro, Alunorte - Norks Hydro, Brazil
- 16.40 **Red mud issues in Vietnam**
Tran Minh Huan, Independent Researcher, Vietnam
- 17.00 **Use of red mud-ash mix to construct red mud dumping embankment at Renukoot**
Bhagwati Sharma, Hindalco, India
- 17.20 **From Red to Green in ten years – a Regulator and Company partnership in bauxite residue remediation in Jamaica.**
Parris A. Lyew Ayea, Jamaica Bauxite Institute, Jamaica
- 17.40 **Revegetation strategies for bauxite residue: A case study of Aughinish Alumina, Ireland**
Ronan Courtney, Limerick University, Ireland
- 18.00 *Closure first day*

TUESDAY, 18 OCTOBER 2011

SESSION 3. BAUXITE RESIDUE AS FEEDSTOCK

- 8.00 **High efficiency in red mud filtration with automatic filter press**
Davide Collini, DIEMME Filtration, Italia
- 8.20 **Red mud filtration test results using AFP IV™ Automatic Filter Press**
Manfred Bach, FLSmidth – AFP, Germany
- 8.40 **A zero waste framework for a new minerals industrial complex**
Juerg Wehrli et al, Hatch, Australia
- 9.00 **Bauxite residue utilization and the lack thereof**
Markus Gräfe et al, CSIRO, Australia
- 9.20 **Study on the alkali pre-treatment for red mud and the application of post-treatment residue as component of construction materials**
Shuhua Ma, Chinese Academy of Sciences, China
- 9.40 **Technological options for effective utilization of bauxite residue**
Ulhas Parlikar, ACC Ltd., a Holcim Group Company, India

10.00 *Coffee break*

10.40 **Red mud in cement industry: raw material and pozzolanic properties**

Yiannis Pontikes, Leuven University, Belgium

11.00 **Preparation and characterization of bricks using bauxite residue - An innovative approach**

B. K. Satpathy et al, Nalco & JNARDDC, India

11.20 **An overview of chemical processes to manufacture red mud construction products**

Arun Wagh, Argonne National Lab, USA

11.40 **Development of natural fibre reinforced polymer composites using bauxite residue for value added products**

Mohini Saxena, AMPRI, India

12.00 **A novel red mud treatment process: Process design and preliminary results**

Efthymios Balomenos et al, National Technical University of Athens, Greece

12.20 **Innovative pyrometallurgical processing technology for red mud from alumina industry and melting unit for the technology implementation**

Yuri A. Gudim, Technologiya Metallov LLC, Russia

12.40 *Lunch*

13.50 **Red mud utilization practices in context of east coast bauxite processing**

H. Mahadevan, Anrak Aluminium, India

14.10 **Mineralogically formulated advanced shielding ceramics utilizing red mud and fly ash**

Jeeshan Khan, AMPRI, India

14.30 **Acidic coal mine refuse reclamation using bauxite residue**

Judodine Patterson, Alcoa Technical Center, USA

14.50 **Wastewater disinfection with bauxite residue and zero valent iron**

Shannon Parks, Alcoa Technical Center, USA

15.10 **A study of red mud as a catalyst for hydrocarbon cracking and application of the resultant carbon deposits for the remediation of contaminated water**

Vidya S Batra, TERI University et al, India

15.30 **Directions for large scale utilization of bauxite residue**

Andrey Panov, Alumina Engineering & Technology Center, UC Rusal, Russia

15.50 *Tea Break*

16.20 **Round table discussion**

- Best Available Technologies and desired R&D projects for solving identified problems in residue processing, storage and storage area rehabilitation.
- Discussion on most likely options for high volume utilisation and outlining R&D projects aimed at solving identified problems.

17.40 **Information about the optional Belgaum visit and Seminar closure**

WEDNESDAY, 19 OCTOBER 2011

Full day field trip to Belgaum's rehabilitated storage areas for registered participants.

REGISTRATION, ADVERTISEMENT & SPONSORSHIP FEES

How to register:

- Download and fill in registration at <http://icsoba.org>
- Email the form to info@icsoba.org or tanisha@icsoba.org or icsoba2008@gmail.com
- Or you may call us on +91 9975372011

Sponsorship

As a sponsor in this ICSoba Event, you will raise your company profile and gain access to key decision makers in this industry. You can choose from various sponsorship packages given in the table below. Lunches, dinners and tea / coffee can also be sponsored.

Company profile of sponsors, co-sponsors and supporters will be published in the souvenir.

Advertisements

A Souvenir will be brought out containing company profiles and advertisements. The tariff is indicated in the table below.

FEES:

| REGISTRATION | ICSoba Members | Non-members |
|---|----------------|-------------|
| Delegates | US\$ 400 | US\$ 500 |
| Students | US\$ 200 | US\$ 300 |
| Govt. R&D Institutions | US\$ 200 | US\$ 300 |
| Accompanying Spouse | US\$ 200 | US\$ 300 |
| ADVERTISEMENTS in the Souvenir | | |
| Back page cover colour | US\$ 1100 | US\$ 1200 |
| Front inside page colour | US\$ 800 | US\$ 900 |
| Back inside page colour | US\$ 600 | US\$ 700 |
| Full Page colour | US\$ 500 | US \$ 600 |
| Half Page Colour | US\$ 300 | US \$ 400 |
| SPONSORSHIP | | |
| SPONSOR Entitles 6 free delegates | US\$ 6000 | US\$ 7000 |
| CO-SPONSOR Entitles 3 free delegates | US\$ 3000 | US\$ 4000 |
| SUPPORTER Entitles 1 free delegate | US\$ 2000 | US\$ 3000 |

Notes to the registration fees

A fee of US\$ 50 per delegate will be charged for the visit to HINDALCO's red mud rehabilitated area on 19 October 2011.

Delegate fee includes conference materials, lunch, dinner and tea/coffee.

Indian delegates and companies can pay an equivalent amount in INR. A flat conversion rate of Rs. 44 can be applied.

Mode of Payment and Communication

You can pay your delegate fee, sponsorship, advertisement, corporate membership fee (US\$500) or individual membership fee (US\$100) in one of the following ways. Receipt of payment will be provided by e-mail upon your request.

Payment by PayPal:

- In case you have a PayPal account (which can be created at www.paypal.com) you can pay directly from your account to info@icsoba.org using the 'send money' option.
- In case you don't want to create a free PayPal account, you can pay your delegate fee with a credit or debit card by clicking on the 'Register' button on ICSOBA's home page.

Payment to the Bank account of ICSOBA secretariat:

- By wire transfer to ICSOBA secretariat, A/5, Rajat Utsav II, Amravati Rd, Nagpur 440033, India
Current Account No. 2162002100009212 of Punjab National Bank (Bharatnagar branch Nagpur-440033, branch code 2162), SWIFT CODE: BUNBINBBNKW.
- By multicity cheque or demand draft in the name of "ICSOBA SECRETARIAT" and send it by post to ICSOBA Secretariat, Row House A/5, Rajat Utsav II Kachimet, Amravati Road, Nagpur 440033, India

Please confirm your payment, and contact us if you have any further payments questions.

E-mail at info@icsoba.org or tanisha@icsoba.org or icsoba2008@gmail.com.

Phone on cell number + 91 9975372011

CONFERENCE INFORMATION

Goa

Goa, a former Portuguese colony with a rich history, is a famous tourist place on the west coast of India. Goa has a unique mix of native and Portuguese cultures and architecture that attract an estimated 2.5 million visitors each year. There are beautiful beaches and several Catholic and Hindu shrines. Goa is well connected with all the major cities of India and there are frequent flights between Mumbai and Goa, which takes only 50 minutes.

Visa and invitation letter

All foreign travellers to India are legally required to hold a valid visa. Delegates must register for the Seminar before lodging their visa/ETA application. Following your registration, you will

receive an invitation letter from the ICSOBA secretariat. For more information, contact your nearest Indian Embassy/Consulate or view the Indian Bureau of Immigration.

Website: <http://www.immigrationindia.nic.in/index.htm>.

Venue and accommodation

The Bauxite Residue Seminar will be organized in Hotel VIVANTA BY TAJ PANAJI, Goa. Please visit the web site <http://www.vivantabytaj.com/panaji-goa/overview.html> for details. ICSOBA has negotiated special room rates for delegates of the Bauxite Residue Seminar.

ICSOBAs rates, including breakfast and airport pick-up:

- INR 5500 per night for single occupancy + taxes (about US\$140)
- INR 6600 per night for double occupancy + taxes (about US\$170)

Delegates can coordinate with the secretariat to book the above hotel or book the hotel directly whilst informing ICSOBA of the same. Contact details of Mr. SuhelKumar Deoda at the hotel are:

E-mail: suhelkumar.deoda@tajhotels.com

Phone: +91 832 663 3636 (general)

+91 832 663 3674 (direct), +91 92259 89313 (cell)

Address: Off D. B. Bandodkar Road, Panaji, Goa - 403 001, India

How to reach Panaji

Goa International Airport is located at Dabolim, 30 km from Panjim. The airport is connected with all major destinations in the country. The hotel can be reached by buses or taxis.

MEDIA PARTNER

www.mmronline.com



Address of the Organizing Committee

ICSOBA SECRETARIAT

Row House A/5, Rajat Utsav II Kachimet,

Amravati Road, Nagpur 440033, India

Phone: + 91 9975372011

Website: <http://icsoba.org/>

E-mail: info@icsoba.org or tanisha@icsoba.org

Contact person is Ms. Tanisha Dutta De, Executive, ICSOBA

You are requested to send all materials related to the Seminar "ICSOBA-2011", to the address shown above. Email messages are preferred. Your participation in the Seminar will be highly appreciated.

Organizing Committee ICSOBA-2011