RECYCLING METALS
FROM INDUSTRIAL WASTE

A Short Course and Workshop
with Emphasis on Plant Practice

June 26-28, 2018
Golden, Colorado
26th Year

Sponsored by the Colorado School of Mines
Course Organizer: Paul B. Queneau - Adjunct Professor
This program focuses on current plant practices to convert metal-containing wastes to products. Processors, raw materials, and markets are identified and quantified. Speakers with decades of hands-on experience detail multiple approaches to recycling metals and associated materials - backed up by slides, videos, and the syllabus.

Particular emphasis is given to combinations of physical, hydrometallurgical, and pyrometallurgical processing, along with associated regulations, to facilitate economical recycling. The presentations are on a practical level, focusing on plant operations, with ample opportunity for interaction by the course participants.

**PROGRAM OUTLINE AND SCHEDULE**

**Tuesday Morning, June 26**

7:45  Registration

8:30  Integrated Recycling Strategies at Boliden’s Smelters
      Joachim Pettersson, Sr. Metallurgist, Boliden, Vasterbotten, Sweden

9:00  Complex Tin Recycling at Fenix and Falcon
      John Broxham, Senior Commercial Director, Fenix Metals, Chmielow, Poland

9:30  Break

9:45  Metals Recycling: Using Metsim to Confirm the Value Case
      Lorena Tere, Engineer in Training/Non-Ferrous Pyrometallurgy, Hatch, Mississauga, Ontario

10:15 LCD’s, the New CRT
      Adam Shine, Vice President, Manitoba Corp., Lancaster, NY

10:45 Break

11:00 Pms & Pgms: Seven Years of Recycling Research in CR3
      Brajendra Mishra, Director, Center for Resource Recovery and Recycling, WPI, Worcester, MA

11:30 Networking Time, Followed by Lunch
      Colorado School of Mines

**Tuesday Afternoon, June 26**

1:00  World Approaches to Recycling Lead
      Tim Ellis, President, RSR Technologies, RSR, Dallas, Texas

2:00  Break

2:15  My Pgm Love Affair / Progress of a Career
      Mel Elguindy, Manager, SAFAGA LLC, Newport Beach, CA

2:45  Vacuum-Metal Refining Worldwide
      Joe Thomas, President, International Applied Technology, Anaheim, CA

3:15  Break

3:30  Metals Recycling at Terrapure Environmental
      Benoit Deschenes, Vice President Manufacturing, Terrapure Environmental, Ville Sainte Catherine, Quebec, Canada

4:00  Social at the Colorado School of Mines
      Coolbaugh Hall Atrium

**Wednesday Morning, June 27**

8:30  How to Win by Recycling Non-Metallics
      Dave Jacobs, Owner, Encore Materials, Pittsburgh, PA

9:00  Towards a Pyrometallurgical Microwave Process
      Chris Pickles, Professor, Queen’s University, Kingston, Ontario

9:30  Break

9:45  The Veolia Model for Electronic Scrap
      Kevin Shaver, General Manager, Veolia Environmental Services, North America, Milwaukee, WI

10:15 The Bre-X Story, and Lessons Learned
      Bill Wilson, Professor of Practice, Nazarbayev University/CSM Partnership, Golden, CO

10:45 Break

11:00 Recycling Pgms from Spent Catalyst
      Jürgen Antrekowitsch, Head, Christian Doppler Laboratory for Heavy-Metal Recycling, Leoben, Austria

11:30 Networking Time, Followed by Lunch
      Colorado School of Mines
Wednesday Afternoon, June 27

1:00  *State-of-the-Art Design for Recycling: Case Fairphone*
Marcus Reuter, Director, Helmholtz-Institute Freiberg for Resource Technology, Freiberg, Germany

2:00  Break

2:15  *Through the Years with Zinc, Lead, and Others*
Mike Deelo, Consulting Engineer, Deelo & Associates, Beaver, PA

2:45  *Yes, There is Recycling in Ore Processing*
Harold Cline, Area Sales Manager Mining, TOMRA Sorting Solutions, Englewood, CO

3:15  Break

3:30  *Integrated Process Development: Lessons Learned*
Alain Roy, Principal - Operations, Kingston Process Metallurgy (KPM), Kingston, Ontario

4:00  *Social at the Colorado School of Mines Geology Museum*

Thursday Morning, June 28

8:30  *Problem Solving in Process Metallurgy*
Tom Battle, Consulting Metallurgical Engineer, Tom Battle and Associates, Charlotte, NC

9:00  *Multi-Metal Recycling and Refining*
Charles Geenen, Director of Technology, Metallo-Chimique, Beerse, Belgium

9:30  Break

9:45  *Recycling Spent Resid/HDS Catalyst*
Mike Shinn, Manager Business Development, H.C. Starck, Huntsville, AL
Larry McHugh, CEO, Orchard Material Technology, Boston, MA

10:15  *One Hundred Years of Recycling at Nickelhütte*
Wendy Fett, Area Manager, Nickelhütte Aue, Aue, Germany

10:45  *Complex Metals: What They Are, Sourcing and Recycling Processes*
Trevor Landry, Manager – Recycling and Precious Metals Aurubis Buffalo, Buffalo, NY

11:15  Adjourn

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**Representative List of Past Attendees**

- Agmet • Air Products • Alferis • Alpha
- Alpha Omega Recycling • AMAG Austria Metall
- AMG Aluminum • AMG Vanadium • Apex Materials Technologies
- Asahi Refining • Aurubis AG • Baldex • Battery Solutions
- Bear Group • BHS Solutions • BioteQ • Blue Line
- Boliden • Brick Recycling • CAF Innovative ShapingChem
- Cal-Chem Metals • Caterpillar • Catalytic Innovations
- CC Consultants • Chevron Energy • Christian Doppler Lab
- Colt Refining • CONECSUS • CRI Metal Products
- CSM/Kroll Institute • CUPROSA • Deloit University
- DH Catalyst • Doo Run • Dowal International
- ECS Refining • E.I. DuPont • ELG Haniel Metals
- Energy Fuel Resources • Engitec Technologies
- Erachem Comilog • EVRAZ Stratorc • Exotech
- 5N Plus Semiconductors • Fenix Metals/Falcon Metals
- Francis Pitard Sampling • Franklin Pierce University
- Freeport-McMoRan • Gannon & Scott • Garrison Minerals
- Genesis Recycling Tech • GFE Metalle und Materials
- GF Industries • Glencore Technology • Global Steel Dust
- Global Tungsten & Metal • Gopher Resource • Greenville Metals
- Hansen Consultants • Harso Metals • Hazen Research
- H.C. Starck • Heraeus Precious Metals • Heritage Environmental
- Huron Valley Steel • Huskey Copper • Hydromet
- HydroProc Consultants • IBM • INMETCO
- IPM Services • IPMI • Itronics • Jean Goldschmidt Intl.
- J.E. Litz & Associates • Johnan Matthey • Kalumetals
- KGHM Matraco S.A. • Korea Inst GeoSci & MinRes
- Langeloth Metallurgical • LithChem Energy
- M&M Metals International • Marcuson & Associates
- Masterloy Products • Metal & Catalyst Resources
- Metalica Commodities • Metallo-Chimique • Metal Solutions
- Metal Tech • Micronutrients/Heritage • Montana Tech
- MoReW-Refractory Metals • Morganite Industries
- Morris Equipment Sales • Music City Group
- Natural Resources Canada • Network Environmental Services
- Nickelhütte Aue • Ocean Partners • OmniSource
- Omnium-Dodge City • Outotec • Patrick Weerts Consulting
- Paul Wurth S.A. • Penoles • Philips Service
- Phoenix Automotive Cores • Pillar Induction
- P.J. Mackey Technology • P. Kay Metal • PM Recovery
- Porocel/Catalyst Recovery • Praxair • Precision Cast Parts
- Queens University • RSR Technologies • RHI AG
- Sabin Metal • Saltire Services • Sanguinetti Engineering
- Scan Arc Plasma Technology • Shell Global Solutions
- ShoreMet • Silver Anvil Engineering • SINTEF • Sipi Metals
- Southeastern Minerals • Stillwater Mining
- Stoller Newport News Nuclear • Sumitomo
- Sustainable Management • Technology & Refining
- Teck Metals • Terrapure Environmental • Tetra Tech
- Tetronics International Tin • Thomas Battle & Associates
- Torma Sorting Solutions • Treibacher Industrie
- Trisman Commodities • TTM Technologies • Tusco • Umicore
- Unicat Catalyst • U. of Leoben • US Ecology
- US EPA • USGS • US Steel • US Zinc • Vale Inco • Veolia
- Wilmington Iron & Metal • WM Mercury Waste • Zinc Nacional
Registration Fee

- $1495 if registering by April 24
- $1595 after April 24 and by May 22
- $1695 after May 22

Included are the syllabus, continental breakfasts, luncheons, and socials. Assistance may be available to self-employed sole consultants, retired, or unemployed attendees...contact Learn@mines.edu for details.

Cancellations and Attendee Substitution Policy

Modification, including cancellation, of your registration requires written notice either by email (Learn@mines.edu) or fax (303-384-2695) to Continuing & Professional Education Services (CPES).

- Attendee substitutions may be made without cost penalty at any time up to the date of the start of the event.
- Cancellations will be accepted if notice of cancellation is received by CPES at least five (5) working days prior to the date of the start of the event. Registrants who cancel within this period will be charged a $275 service fee.
- No refunds will be made to registrants who fail to cancel within the specified cancellation period.

Credits

CSM awards two Continuing Education units for this course.

Location and Attire

Golden and the Colorado School of Mines (CSM) are located at the foot of the Rockies 15 miles west of Denver. The area is steeped in western history. Mountain hiking and biking trails begin in town along Clear Creek and the Whitewater Park. Attire is casual.

Accommodations, if blocks are not full

Blocks of rooms in Golden are at the Table Mountain Inn (Tel: 303-277-9898; Fax: 303-271-0298) by May 26, and the Golden Hotel (Tel: 303-279-0100; Fax: 303-215-1010) by May 10, under the designation "Recycling Short Course." The Dove Inn B&B (Tel: 303-278-2209; Fax: 303-273-5272 is also close by; it is super for couples; the best rooms fill quickly. Golden is a popular summer destination, so book your reservation early.

Course Content Details

Contact Paul Queneau at The Bear Group: 303-854-2036, fax 303-273-0494, e-mail: pqueneau@mines.edu

Registration Information

Continuing and Professional Education Services (CPES) at Mines: phone: 303-384-2690 • fax: 303-384-2695
e-mail: Learn@mines.edu • website: www.csmspace.com

Comments from Past Participants

This conference, dollar-for-dollar, is the best that I attend all year! As always, it is a first-rate experience: Quality and diversity of speakers, networking, and opportunities.

Richard Nickerson, President, Cal-Chem Metals, Globe, AZ

What I like best is the variety of presenters and presentations, opportunities to interact with potential partners, and the innovations.

Matt Stevens, Process Coordinator, Stillwater Mining, Columbus, MT

The best companies in the field are identified, attracted to attend, and to make a presentation. Lots of time is available for networking.

Fred Steward, President, Micronutrients, Pittsburgh, PA

This short course’s most significant strengths are the variety of topics, the variety of participants, lots of time for socializing and interacting, in Golden… What a magnificent setting!

Charles Geenen, Director Technology, Metallo-Chimique, Nieuwe, Belgium

After a hiatus of 3 years, I returned to Golden to attend the Recycling Metals course. Key course strengths are content, opportunities to network, meeting new friends, and learning new concepts/processes. My only regret was wondering “What did I miss in the previous 3 years”?

John Likarish, Manager of Marketing, The Doe Run Resources Corporation, St. Louis, MO

It is amazing how this course always pays for itself with new business leads, not to mention it’s such a catalyst for new ideas and innovations.

Scott Volner, President, Catalytic Innovations, Rolla, MO

Simply the best conference of its kind anywhere: Excellent content and contacts year after year, with diversity and balance.

Nigel Morrison, President, AMG Aluminum, Wayne, PA