

2.1 Partial Leaches in Exploration and Environmental Geochemistry

One day course and workshop

Date: 24th September 2005 (Saturday after the IGES)

Place: Perth Sheraton (provisionally)

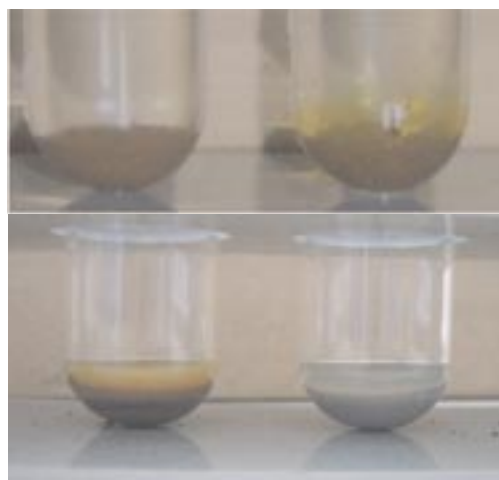
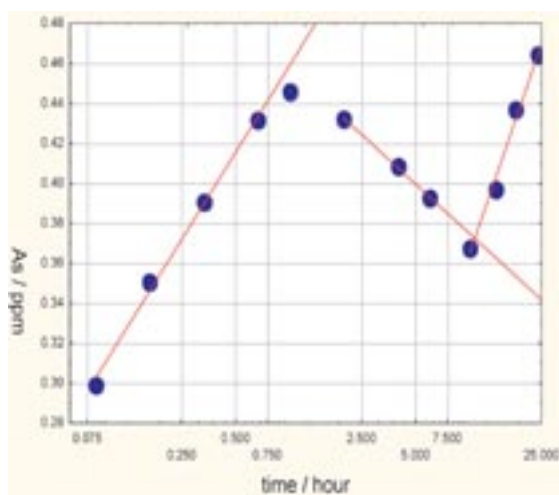
Course Presenters: *Gwendy Hall, Brenda Caughlin, Barry Smee, Iain Dalrymple, Rob Bowell, Russell Birrell, Neil Rutherford, Andrew Rate and Stew Hamilton*

Course Registration A\$253

A large team has been assembled to give you a wide range of viewpoints on this multifaceted subject. This course will cover the use (advantages and pitfalls) of a wide range of partial leach techniques that have been applied in both exploration and environmental geochemistry. They will be placed in their historical and practical context.

Contents

- Analytical protocols for partial leaches - managing data at the detection limit.
- Weak leach geochemistry, the early years: What did we learn and when did we learn it?
- Selective leaching - a tool in identifying an element's provenance and destiny (much on sequential leaching – strengths and pitfalls).
- Deep cover, deep weathering and the character of geochemical signals: A case study from Osborne, Cloncurry district, NW Queensland.
- An examination of the chemistry of hydroxylamine and acetate leaches and the implications for the interpretation of partial leach surveys.
- Simulating environmental weathering: use of partial leaching to evaluate mine waste geochemistry.
- Interesting applications of partial extraction geochemistry to near surface soils.
- The dos and don'ts of soil sampling for selective leach and complementary techniques
- Understanding controls on selective extraction of metal ions in highly weathered soils - examples using bulk cyanide leach.



Presenters:

(Gwendy Hall (BSc, MSc, DSc.) (Course leader)

Geological Survey of Canada, Ottawa, Ontario, Canada

Email: Ghall@NRCan.gc.ca

Gwendy has more than 30 years at the Geological Survey of Canada developing and applying new analytical methods in exploration and environmental geochemistry. She is recognized as one of the foremost practitioners in method development of the analytical technique of ICP-Mass Spectrometry, having worked with Sciex prior to the commercial release of the first instrument. She recently served as the coordinator of a multi-partnered project designed to further develop geochemical methods of exploration for deeply buried mineral deposits.

Her geochemical methods are actively and routinely transferred to industry and for this she won the Federal Partners in Technology Transfer Award in 1998. She has published widely (over 200 papers and eight book chapters). She is a Past President of the Association of Exploration Geochemists (AEG, now AAG), was the AEG/AAG Distinguished Lecturer for 1998-99, is a past Editor of the Journal of Geochemical Exploration, and current Editor-in-Chief of the journal Geochemistry: Exploration, Environment and Analysis (GEEA) published by the Geological Society of London and

the AAG. She was the 2001 Adrian Smith lecturer for the University of Waterloo and is currently distinguished lecturer for the CIM (Canadian Institute of Mining).

Brenda Caughlin (PhD)

Organisation

Email Brenda.Caughlin@alschemex.com

With over twenty-two years experience in the industry, Brenda has an international reputation as a geochemical analyst. She is responsible for technical development and oversight of the global ALS Chemex group. She has a degree specialization in analytical spectroscopy and was instrumental in developing ICP services at ALS. Most recently, she has been involved in the development of the integrated laboratory management systems (GEMS) for the ALS Chemex group.



Barry Smee (BSc, PhD)

Smee and Associates Consulting Ltd

Email: bwsmee@geochemist.com

Barry Smee is a consulting geochemist based in British Columbia. He obtained a B.Sc. in chemistry and geology from the University of Alberta, and a Ph.D. in geochemistry from the University of New Brunswick. He has designed and managed commercial analytical laboratories and worked in academia, government and industry for over 35 years. He has authored or co-authored over 40 scientific papers on geochemical and quality control topics. Barry formed Smee and Associates Consulting Ltd. in 1990 through which he has actively promoted the use of Quality Control protocols in mineral exploration, comprehensive due diligence procedures, and the intelligent use of modern geochemical methods.



Iain Dalrymple (BSc)

School of Biological, Earth and Environmental Sciences, University of New South Wales

Sydney, Australia

Email: Iain_Dalrymple@bigpond.com

Iain Dalrymple is studying for his PhD at the University of NSW. He studied both geology and chemistry at an undergraduate level and received academic awards in both. His postgraduate research has been in the optimisation and interpretation of partial leaches.

Rob Bowell (BSc (Hons) PhD C.Chem MRSC C.Geol FGS)

SRK Consulting, Cardiff, Wales, UK

Email: srk003@aol.com

Rob is a Principal Geochemist with 18 years experience. He specialises in applying geochemistry and mineralogy to a wide range of mining and engineering problems. His background is in mineral exploration in deeply weathered terrains and in academic research in exploration and environmental geochemistry, environmental engineering and mineralogy. His main field of expertise is in geochemical treatment of mine waste and water (including arsenic-rich waste, cyanide solutions, acid rock drainage and saline water). He has published over 120 papers in the fields of environmental and exploration geochemistry, treatment of mine waste and water. Rob is a fellow of the AAG, the current Vice President of the Association and a deputy editor of GEEA.

Russell Birrell (degrees)

MMI Technology, Bentley, Western Australia

Web page: www.mmigeochem.com

Email: russell@mmigeochem.com

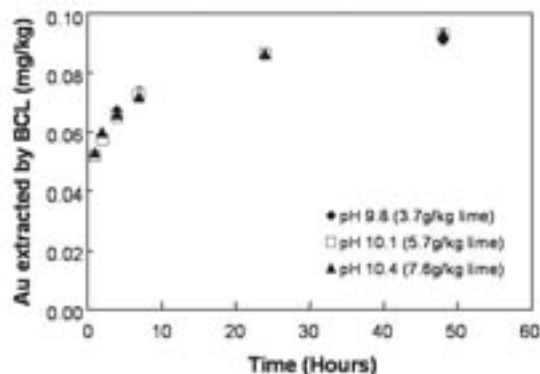
Russell is a founding director of MMI Technology and The Geochemistry Research Centre, Perth, Australia. He has worked in the global exploration industry for some 30 years in research and exploration for a wide range of commodities. During the last 12 years he has been involved in development of partial extraction geochemistry for near surface soil samples and its application to the mining, petroleum and agricultural sectors.

Stew Hamilton (BSc, MSc. P. Geo)

Sedimentary Geoscience Section, Ontario Geological Survey, Sudbury, Ontario, Canada

Email:stew.hamilton@ndm.gov.on.ca

Stewart graduated from Laurentian University in Ontario, later completing his Masters at Carleton University and is working on his Doctorate at the University of Ottawa. He has worked for the Geological Surveys of Canada and Ontario, Jacques Whitford Environment Limited and Water and Earth Science Associates Limited (WESA). He has been involved in research into geochemical exploration techniques in areas of thick overburden and glacial cover. He has compared various selective leach analytical methods, tested various SP and redox measurement techniques and investigated element transport processes. He has conducted two and three dimensional multi-media geochemical sampling of groundwater, surface water, soils, humus and biological media at sites with known base metal and/or gold mineralisation, developing a new geochemical model that suggests electrochemical dispersion driven by redox gradients. He has investigated the geochemical origin of 'forest rings', enigmatic circular features in Northern Ontario. He has managed five projects mapping lake sediment and lake water geochemistry over large parts of NE Ontario. Currently, Stewart is the AAG's Distinguished Lecturer and has over 32 publications.



Andrew Rate (BSc, PhD)

School of Earth & Geographical Sciences, University of Western Australia

Email:Andrew.Rate@uwa.edu.au

Andrew trained in aquatic chemistry and soil chemistry in New Zealand before moving to Perth in 1995 to join The University of Western Australia where he currently works as a Senior Lecturer. His teaching and research interests and publication record centre around the chemistry of trace elements in natural systems, with a particular focus on the kinetics and equilibria of adsorption processes.

Neil F. Rutherford (BSc(Hons), PhD, GradDipNatRes, FAIG, FAAG)

Rutherford Mineral Resource Consultants, Coogee, New South Wales, Australia

Email: rminres@zip.com.au

Neil has some 30 years experience in mineral exploration. He offers independent general and specialist exploration consulting services for mineral exploration worldwide, specializing in geochemical consulting, data processing and interpretation, and project evaluation. He participates in research into new exploration strategies and geochemical methods. This has included the development of the Regoleach partial leach technique with the ALS-Chemex Group, exploration environmental base line and field orientation studies with the University of New South Wales and the CSIRO in Australia. He has managed a major regional stream sediment program for the New South Wales Department of Mineral Resources and developed several large-scale regional geochemical programs for industry. He has extensive experience with partial leach techniques and has applied these techniques in a wide range of deeply weathered regolith environments. He has been a regular contributor to the University of NSW courses in Exploration Geochemical Data Processing and offers custom on-site geochemical workshops with UNSW to industry and government agencies.