



Much has happened since our last newsletter. Below are some highlights from recent Canadian and international events, as well as some updates on the progress of recent BARC initiatives that are stimulating critical evaluation and validation of bioaccessibility methods.

BARC Strategic Planning Workshop

A BARC workshop sponsored by Health Canada was held in Mississauga, Ontario, Canada, on Oct. 11-12, 2007. The workshop involved 32 participants from Canada, the United States, Europe and Australia, and included the metals/mining industry, regulatory agencies, risk assessors and university researchers. The purpose of the workshop was to:

1. Refine and gain consensus on the technical and logistical aspects of the initial BARC round-robin study that is being co-ordinated by the Environmental Sciences Group of the Royal Military College;
2. Initiate the development of a research framework and funding strategy to address the bioaccessibility/bioavailability research gaps identified at the Health Canada workshop on Dec. 5-6, 2006; and
3. Initiate discussions on the collection and preparation of standard reference materials that are critical for scientific and technical research, including future BARC round robins.



The workshop was co-chaired by Ken Reimer and Beverley Hale. Joanna Wrapp, research scientist with the British Geological Survey, was invited to give a presentation on the Bioaccessibility Research Group Europe (BARGE) round-robin experience. The lessons learned by BARGE during three self-funded round robins provided some useful insights for navigating the initial BARC round robin.

Andy Rencz, a research scientist with the Geological Survey of Canada, was invited to facilitate a discussion on standard reference materials (i.e. what a Canadian reference soil should look like, and how many different soils are needed to address issues confronted by risk assessors). It was decided that for the purposes of this initial round robin, one reference soil would be sufficient. NIST 2710 was chosen as the standard reference material over NIST 2711, because it has a mineral content that is of more interest to Canadian labs.

International Society of Exposure Analysis

Oct. 14-18, 2007, Durham, North Carolina, USA

The 17th annual conference of the International Society of Exposure Analysis in Durham, NC, a four-day international event, was attended by more than 500 delegates from 13 countries. Symposia at the event ranged from 'Exposure sampling methods' to 'Exposure assessment approaches for chemical mixtures.' Information on the conference and the next event, to be held in Pasadena, California in October, 2008, can be found at <http://www.iseaweb.org/>.

A special one-day symposium was organized by Pat Rasmussen (Health Canada), Mark Cave (British Geological Survey), Karen Bradham (USEPA) and Rosalind Schoof (Integral Consulting Inc.) to discuss the use of in-vitro bioaccessibility/relative bioavailability estimates in a regulatory setting, and the requirements for the use of such data. The audience consisted of interested representatives from the research, regulatory and risk assessment communities. Talks on the current thinking surrounding research issues and policy decisions provided a balanced view of the latest international bioaccessibility and bioavailability information, and gave ample time for audience discussions with the panel. Of particular note were contributions that discussed how the research community supports in-vitro data with supplementary information and testing regimes, especially those regarding the source and the geochemistry of contaminants of concern. This type of information is invaluable in the development of international collaborative efforts.

The bioaccessibility/bioavailability symposia produced lively debate from both the speaker panel and the audience. Debate over the validation status of in-vivo relative bioavailability data, with respect to potentially harmful elements, and the problems faced by research scientists and the regulatory community

alike, have led to further communication among delegates outside the symposium. The results of these talks have promoted international collaborative efforts and a new era of information and data sharing that will benefit all involved. Specifically, the international, cross-discipline arsenic relative bioavailability working group has been established. The working group will share information and materials, and its members will communicate on a regular basis.

Number of groups	16
Number of methods	19
RBALP/Glycine	5
PBET	5
RIVM/BARGE	3
IVG	2
HCI	2
SHIME	1
Phosphate	1

Summary of methods used in BARC Round Robin experiment

BARC Round Robin

There was considerable discussion among BARC members who participated in the strategic planning workshop regarding the objectives of the BARC round robin. Consensus was that the initial round robin should focus on addressing the variability between the different labs. Subsequent round robins will build on this initial exercise by examining the variability among methods between labs, and comparing lab results to toxicological reference values that are commonly referenced by risk assessors.

The initial BARC round-robin experiment is now under way. We are pleased with the participation in the experiment, both in the number of groups (16) and their breadth: eight of them are university groups, four are government groups, and the remaining four are consulting/commercial laboratories. It's a truly international effort with five non-Canadian groups from the US, the UK and the Netherlands participating.

The round robin is designed to tell us about the variability among laboratory methods using a single matrix, and the experiment encompasses 19 methods. There are some similarities among methods, the most frequently occurring being the RBALP (glycine-containing) type and the PBET type. Most groups have completed their extractions and sent their samples to the Queen's University Analytical laboratory and are awaiting results. Communication has been very effective so far and we anticipate that the experiment will be a successful collaborative BARC team effort.

Developing the Profile for a Canadian Reference Soil

At the October, 2007, BARC strategic planning workshop, Ken Reimer proposed that a subcommittee be formed to continue the dialogue on the collection and preparation of standard reference soils. The aim of the subcommittee will be to create a profile for two or three soils that addresses the risk assessment needs of Canadian industries, regulators and commercial labs.

Important soil characteristics to consider include organic matter content, particle-size fraction, horizons, cation exchange capacity, mineralogy, organic analysis, trace elements, major elements, oxides, and absorbency. It will also be important to consider which properties are correlated and to separate the inter-correlations.

There was widespread agreement at the BARC workshop that reference soils should be available in sufficient quantities to allow a database to be built over time, and these soils must have an appropriate mineral content to be of interest to Canadian labs and support research on different sources of contaminants, including mining sites, brownfields and agricultural lands. It would also be beneficial to have soils with in-vivo relative bioavailability data attached to them.

Volunteers for the BARC soils subcommittee are now being recruited. If you are interested in participating please contact Bev Hale (bhale@uoguelph.ca) or Ken Reimer (Reimer-k@rmc.ca)

BARC Research Framework

A second BARC subcommittee was formed at the October, 2007, workshop to further develop the research framework and funding strategy for addressing research gaps in bioaccessibility/bioavailability methods. Participating on the committee are Mike Dutton, Vale Inco; Guy Gilron, Teck Cominco; Beverley Hale, University of Guelph; Steve Siciliano, University of Saskatchewan; and Ken Reimer, Royal Military College. The focus of this proposal will largely be driven by the research needs of industry and private-sector partners to ensure that new knowledge and technologies are successfully exploited for the benefit of the Canadian economy.

Vale Inco's Mike Dutton hosted the first BARC subcommittee meeting in Toronto on Dec. 18, 2007. Significant progress was made in refining the scope of the research project, and plans are under way to submit a proposal for an NSERC Collaborative Research and Development (CRD) Grant.