

## **Superfund Technical Review Workgroup (TRW) – Bioavailability Committee (BAC) 2024 Accomplishments**

The Technical Review Workgroup Bioavailability Committee (TRW-BAC) provides site consultation relevant to contaminant bioavailability in soil site assessment activities in support of regional requests. The TRW-BAC also identifies research needs to address data gaps and develops technical guidance concerning bioavailability in human health risk assessment at hazardous waste sites.

### **Technical Support**

One of the fundamental roles and responsibilities of the TRW-BAC is to provide technical support regarding the assessment of relative bioavailability (RBA) and its application to human health risk assessment at Superfund sites. This support is provided to EPA regional risk assessors as well as other federal, tribal, state, non-governmental, and international groups. Furthermore, the TRW-BAC promotes the best use application of available scientific information concerning RBA and human health risk assessment methods in soil and soil-like (e.g., floodplains) media at affected sites.

The TRW-BAC members are experienced and highly trained professionals in chemistry, toxicology, and human health risk assessment, and provide expert assistance in complex risk assessment scenarios.

In 2024, the TRW-BAC consulted on four requests for assistance from EPA Regions (Regions 2, 5, 6, and 9). The TRW-BAC also responded to five other technical support requests: one from the Montana Department of Environmental Quality; one from the Michigan Department of Environment, Great Lakes, and Energy; one from a US consultant; and two from foreign consultants.

Technical support requests were on the following topics:

1. Effect of lead speciation and soil aging on bioavailability;
2. Comparison of different In Vitro Bioaccessibility Assay methods;
3. Application of bioavailability to sediments;
4. Sampling approach to bioavailability measurements;
5. Historical data on lead RBA at smelter sites; and
6. Application of soil metal bioavailability/bioaccessibility in risk assessment to determine site clean-up goals.

### **Methods and Tools Development**

In 2024, the TRW-BAC developed the Bioavailability Sampling Planning and Evaluation Tool (BSPET) to support the 2021 Bioavailability Sampling Guidance (*Guidance for Sample Collection for In Vitro Bioaccessibility Assay for Arsenic and Lead in Soil and Applications of Relative Bioavailability Data in Human Health Risk Assessment*). The BSPET tool uses simulation techniques to predict false compliance and false exceedance decision error probabilities

expected from user-selected sampling plans. The tool can be used to identify sampling plans expected to meet sampling Data Quality Objectives (DQOs) and to evaluate results to determine if DQOs were achieved as recommended in the 2006 DQO Guidance (*Guidance on Systematic Planning Using the Data Quality Objectives Process*, EPA/240/B-06/001).

The TRW-BAC is currently updating Method 1340 in the SW846 Test Methods Compendium. This update will formally add arsenic to the method, as well as provide updated concentrations for new standards.

The TRW-BAC continues to support development and refinement of the mouse RBA assays for arsenic and lead and research on soil amendments for permanently reducing arsenic and lead bioavailability. This includes a study that was completed to compare interlaboratory performance of the mouse lead RBA assay. A manuscript was developed that presents the results of the study: *Evaluation of Performance of a Mouse Assay to Estimate the Oral Relative Bioavailability of Lead in Soils and Dusts*.

### **Communication, Training, and Outreach**

The TRW-BAC developed training videos and materials for EPA Regional training sessions on application of the updated RBA sampling guidance. The TRW-BAC provided this training in 2024 through the Clu-In webinar program as a four-part series and was open to the public.

The TRW-BAC also developed a training on bioavailability for human health risk assessors that covered study design to include bioavailability analysis, bioassays and in vitro bioaccessibility, and how to apply the bioavailability data to risk assessment. The TRW-BAC presented this training at the Office of Land and Emergency Management's (OLEM) Human Health Regional Risk Assessment Forum's (OHHRRAF) 2024 annual meeting.

In addition, the TRW-BAC developed technical memos describing the mouse model assays to assess RBA of arsenic and lead. These technical memos will be released in 2025.

Lastly, the TRW-BAC authored two fact sheets for the public that provide an overview of measurement and application of lead and arsenic RBA, respectively. These fact sheets will be published in 2025 to help risk assessors, RPMs, OSCs, and community involvement coordinators discuss bioavailability of these contaminants.

### **Patents, Publications, and Presentations**

Members of the TRW-BAC were awarded one patent on methods for sequestering ions in an environmental matrix. TRW-BAC members also published seven papers in peer-reviewed journals and participated in 15 presentations at national and international scientific meetings.

**Technical Review Workgroup Bioavailability Committee Members:**

**Region 1**

Courtney Carroll

**Region 2**

Julie McPherson

**Region 4**

Shanna Alexander

**Region 5**

Keith Fusinski

**Region 6**

Ghassan Khoury

**Region 7**

Ann Jacobs

**Region 8**

Sydney Chan (co-chair)

Charles Partridge

**Region 10**

Katie Adams

Marc Stifelman

**NEIC – Denver**

Bradley Miller

**OEM**

April Luke

**ORD CESER**

Aaron Betts

Todd Luxton

Mathew Noerpel

Kirk Scheckel

**ORD NERL – CEMM**

Karen Bradham (co-chair)

Tyler Sowers

**OSRTI**

Michele Burgess

Matthew Lambert (co-chair)