

**Workshop associated with the  
IAEA Technical Reports Series Document on  
“Environmental Transfer Parameters for Wildlife” Handbook**

**MINUTES**

**IAEA/Canadian Nuclear Safety Commission (CNSC) Headquarters, Ottawa, Canada  
16–17 November 2009**

### **Meeting objectives**

The aim of the meeting was to provide the opportunity for scientists from North America to participate in a similar IAEA meeting to those held previously in Monaco and Vienna in 2009. The meeting objective was to discuss relevant data largely from terrestrial ecosystems which will be used to provide concentration ratios for the Technical Reports Series (TRS) Handbook on Transfer of Radionuclides to Wildlife and the ICRP Committee 5 (C5).

### ***Meeting plan***

Brenda Howard, on behalf of the IAEA, gave an introduction to the Transfer Handbook and the association with the EMRAS II Working Group 5 (WG5) on Transfer. There followed a series of presentations (see the Meeting Agenda below) on potentially relevant data that each participant may be able to input into the online database and on the variation in freshwater distribution coefficients (Kd) used in the assessment models.

### ***Online database***

The online database, developed to support the IAEA Technical Report Series document currently under preparation, and constructed by the Environment Agency (EA) in England and Wales was presented by David Copplestone. The terrestrial and marine data used in ERICA have been reformatted, QC'd and input into the database for marine and terrestrial ecosystems. Extensive datasets from other sources are being entered using an excel template rather than through the online system. Work was ongoing during the meeting to derive original freshwater values from the information in the database from the ERICA Tool, which included some review values, to supplement the extensive database being compiled from data supplied by COG, CNSC, Areva, RIARAE and CEH.

The availability of data within the database was discussed. The updated summary tables will be available to all registered users; the final level of presentation of data in the summary tables (e.g., terrestrial mammal or terrestrial mammal – carnivorous, etc.) will depend upon the amount of available data for sub-categories and the statistical justification for summarisation as sub-categories – this will be decided in the final stage of preparation of the handbook. Further discussion is needed regarding data access and will be included during the next EMRAS II WG5 meeting (being held during the 2<sup>nd</sup> EMRAS II Technical Meeting (TM), IAEA Headquarters, Vienna, 25–29 January 2010).

Key information and outcomes of the talks and associated discussions are summarised below.

### **1. Consideration of CR datasets**

Some substantial datasets have been submitted to the database from Japan (NIRS), Canada (Candu Owners Group), Russia (RIARAE) and Australia (ANSTO) and these are undergoing QC before being entered into the database. Further databases are in the final stages of submission from Russia and Canada and other EMRAS II WG5 participants.

## **2. Conversion of data**

A significant effort was made by T. Yankovitch and N. Beresford during the week of the meeting to collate the compiled information, including some supplied by EMRAS II participants, on conversion values from organ to whole body and for weight basis (ash, dry, fresh). These tables will form an important component of the handbook and are likely to be extensive (they will be reported in one of the papers contributing to the issue of Radiat. Environ. Biophys., arising from the Monaco and Vienna meetings). The conversion values are also important for the database.

## **3. Progress in ICRP C5**

ICRP C5 has now finalised ICRP 108 (2008) which is now available online and in hard copy. It is preparing a number of reports via various task groups, notably a report on transfer to the Reference Animals and Plants. Of particular relevance to the handbook and EMRAS II WG5, the allocation of ICRP RAPs when entries are being made into the database are often incorrect as the exact definition used for each RAP by the ICRP is often being misunderstood. For instance, species for any crab or brown seaweed are being entered as relevant to the ICRP RAPs Crab and Brown Seaweed which are actually defined as species belonging to the families *Cancriidae* and *Fucaceae*, respectively (the online database provides a table which cross links the IAEA database organism categories with the ICRPs RAPs).

## **4. Assessment Tools**

The performance of currently available assessment tools has been compared in EMRAS I and this is continuing in EMRAS II. Some of the assessment tools have been markedly improved with time and some earlier versions of tools should not now be used since the later versions are improvements and supersede the former versions. For instance, the ERICA Tool should be used rather than the FASSET, EPIC or R&D128 (with the exception of noble gas assessments) methodologies and parameter values.

## **5. Kd values**

The session on Kd values demonstrated that Kd values can vary considerably with soil or sediment characteristics and that there is additional data to that already available in current IAEA documents in the literature (including data for the freshwater values where a seawater value is currently used). The marine values used in the ERICA Tool for freshwater systems may well differ from those for freshwater systems, but Kd will also vary considerably within freshwaters with factors such as pH and organic matter content. Assessment tool predictions can be sensitive to the value of Kd and therefore this parameter value is important. Nevertheless, given the limited time and resources for the production of the IAEA handbook on transfer parameters for wildlife, it was felt that it was inappropriate to compile additional information on Kd values in the handbook to those already available in various IAEA publications, but to highlight where there are data gaps. However, the provision of a document on the use of Kd, provision of values for terrestrial, freshwater and marine in one document with an attempt to provide missing values, guidance on Kd variation with selected key soil/sediment characteristics and information on the sensitivity of assessment outcomes, would be valuable. Any such document should importantly consider what the appropriate definition of Kd is for aquatic systems when considering wildlife assessments where it is most commonly used to predict bed sediment concentrations, from input water concentrations, to determine the external dose rate to benthic organisms.

## 6. Other relevant activities

Information was provided on the:

- Regional Training course on Radioecology and Environmental Protection that was recently given in Vienna for the Technical Cooperation (TC) Project RER/7005;
- Series of training courses on assessment tools for radiation protection of the environment and associated web based learning materials that will be given in the UK by CEH, EA, IRSN and WSC from April 2010 for 2.5 years;
- IAEA TC Project on radioecological assessment of the uranium production legacy sites (case studies in Central Asia);
- Preparations for the hosting of the next International Conference on Radioecology and Environmental Radioactivity at McMaster University, Ontario, Canada, 19–24 June 2011.

## 7. Next EMRAS II WG5 Meeting

The next relevant meeting will be the EMRAS II WG5 meeting during the 2<sup>nd</sup> EMRAS II Technical Meeting (TM), IAEA Headquarters, Vienna, 2–29 January 2010.

<b>MEETING AGENDA</b>		
<b>Monday, 16 November 2009</b>		
09:00	Overview of objectives and review of progress	B. Howard
09:30	Update on ICRP Committee 5 activities including transfer group	K. Higley
11:00	On-line transfer database	D. Copplestone
11:30	Status of the freshwater database	N.A. Beresford/T. Yankovich
12:00	CNSC data compilation of data from U-industry monitoring in freshwater ecosystems	M. Phaneuf
12:15	The CANDU operators database for freshwater ecosystems	J. Ryan/T. Yankovich
13:30	Freshwater fish and invertebrate data from Canada	D. Rowan
14:00	Background dose rates to aquatic wildlife	J. Brown
15:00	Does the ERICA 'guidance methodology' to selecting missing CR values work?	N. Beresford/J. Brown
16:00	Transfer of elements to ducks and owls determined using neutron activation and gamma analysis	Brenda Howard
16:30	Progress on deriving recommended tissue: whole-body correction factors	T Yankovich
<b>Tuesday, 17 November 2009</b>		
09:00	A collation of freshwater Kd values	T. Yankovich
09:30	Do we have a problem with freshwater Kd values?	B. Howard/E. Tipping
10:00	Steady state assumptions for CR and Kd values	D. Rowan
11:00	Soil-water kd's and geochemical models	D. Kaplan
11:30	Po-210 and 210Pb in a Nordic terrestrial ecosystem	J. Brown
13:00	Current studies on transfer	K Higley
13:45	KE course update	B Howard
14:00	IAEA Technical project RER 7005	B Howard/D. Copplestone
	Report on recent presentations in Vienna Oct 09 including Hospitals, U mining	
14:30	Meeting summary and actions	

<b>List of Participants</b>	
<b>Name / Email</b>	<b>Organization / Country</b>
Mr Nicholas Beresford (nab@ceh.ac.uk)	Centre for Ecology & Hydrology (CEH), UK
Ms Rossita Blagoeva (rossita.blagoeva@forces.gc.ca)	National Defence Headquarters, Canada
Mr Justin Brown (justin.brown@nrpa.no)	Norwegian Radiation Protection Authority (NRPA), Norway
Mr David Copplestone (david.copplestone@environment-agency.gov.uk_)	The Environment Agency (EA), England and Wales
Mr Elias Dagher (Elias.Dagher@cnsccsn.gc.ca)	Canadian Nuclear Safety Commission (CNSC), Canada
Ms Barbara Dowsley (Barb.Dowsley@cnsccsn.gc.ca)	Canadian Nuclear Safety Commission (CNSC), Canada
Mr Richard R. Goulet (richard.goulet@cnsccsn.gc.ca)	Canadian Nuclear Safety Commission (CNSC), Canada
Ms Brenda J. Howard* (bjho@ceh.ac.uk)	Centre for Ecology & Hydrology (CEH), UK
Ms Kathryn Higley (kathryn.higley@oregonstate.edu)	Oregon State University, USA
Mr Michael Ilin (Michael.Ilin@cnsccsn.gc.ca / ilinm@cnsccsn.gc.ca)	Canadian Nuclear Safety Commission (CNSC), Canada
Mr Daniel I. Kaplan (daniel.kaplan@srnl.doe.gov)	Savannah River National Laboratory (SRNL), USA
Mr Steve Mihok (steve.mihok@cnsccsn.gc.ca)	Canadian Nuclear Safety Commission (CNSC), Canada
Mr Hemendra Mulye (Hemendra.Mulye@cnsccsn.gc.ca)	Canadian Nuclear Safety Commission (CNSC), Canada
Ms Marcelle Phaneuf (Marcelle.Phaneuf@cnsccsn.gc.ca)	Canadian Nuclear Safety Commission (CNSC), Canada
Mr Mike Rinker (Michael.Rinker@cnsccsn.gc.ca)	Canadian Nuclear Safety Commission (CNSC), Canada
Mr David Rowan (rowand@aecl.ca)	Atomic Energy of Canada Limited (AECL), Canada
Ms Judy Ryan (judy.ryan@candu.org)	CANDU Owners Group, Canada
Ms Tamara L. Yankovich (tamara.yankovich@areva.ca)	AREVA Resources, Canada

\* Acted as IAEA Representative.