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8th EMRAS TRS-364 Working Group Meeting

(Revision of IAEA Technical Report Series No. 364, "Handbook of parameter values for the prediction of radionuclide transfer in temperate environments")

6–8 June 2007
UIC, Paris, France

M I N U T E S

List of Participants:

Mr. Calmon, P.	IRSN	France,	Chairman
Mr. Choi, Y. H.	KAERI	Korea	
Mr. Ciffroy P.	EDF	France	
Mr. Conney S.	Food Standards Agency	U.K.	
Mr. Fesenko, S.	NAAL, Seibersdorf	Austria,	Scientific secretary
M. Krasnov, V	Institute of Forestry	Ukraine	
Ms. Leclerc, E.	ANDRA	France	
M. Orlov, O	Institute of Forestry	Ukraine	
Mr. Proehl, G.	GSF	Germany	
Ms. Rantavaara, A.	STUK	Finland	
Ms. Rigol, A.	Universitat de Barcelona	Spain	
Ms. Tagami, K.	NIRS	Japan	
Mr. Uchida, S.	NIRS	Japan	
Ms. Varga, B.	National Food Investigation Inst.	Hungary	
Mr. Vidal, M.	Universitat de Barcelona	Spain	
Mr. Davis, P.	AECL	Canada	"^{3}H & ^{14}C" WG
Ms. Howard, B.	CEH	U.K.	"Dose to biota" WG

Foreword

Many thanks to all the participants for their contributions and work during these three days. Thanks are also due to the other working groups which effectively contributed to the meeting.

Objectives of the meeting

— To comment and discuss the different contributions received for TECDOC and TRS,

— To draw a list of late contributors,

— To discuss the JER special issue: format, number of pages, list of late authors, and practical organization of review process.

M I N U T E S

1. Introduction

Chapter is finalised according to the comments made at the November meeting.

2. Definitions, data analysis and use of analogues

Subsections: “Definition and units” and “Data analysis” are finalised.

2.3. Use of analogues

This section, prepared by Ms. E. Leclerc, presents the general features of the method proposed to derive analogy, with some examples to illustrate the different possibilities. Ms. K. Tagami and M. S. Uchida presented their contribution about stable elements, which is an appropriate example to derive analogy, in case of equilibrium conditions. Ms. B. Varga proposed to provide very soon her contribution to this section. Ms. E. Leclerc will ask Mr. C. Colle to review the different examples of analogy and also to give examples that could illustrate the limitations in the use of analogues.

3. Foliar uptake

3.1. Interception (Mr. G. Prohl)

Sub-section is nearly completed. There are still few comments from the November meeting which should considered. References should be numbered; tables and figures should be presented in the requested formats.

3.2. Weathering (Ms. E. Leclerc)

Subsection is also close to be finalised some comments to be considered in the final version are given below:

— In the definition, to add the sentence “is a process of self-clearance of plants…”

— To specify the plant groups in the tables.

— To replace weathering rate by weathering half-life

— To check if growth dilution is included or not in the different references. Two possibilities: to have two tables (for growth dilution included and another one for not included) or to recalculate the values from Mr Choi taking into account growth dilution if possible.

3.3. Translocation (Ms. E. Leclerc)

— We wonder whether it is referred only to wet deposition in the introduction

— To check why the growth stage for rice was not determined in table 3.3.1

— If possible, to give individual information for range of values for each growth stage

— To replace “0” by “-“

— If it is not possible to inform about the growth stage, a footnote is needed to say that it is closely dependent on the growth stage and that it is a great source of variability

— Concerning translocation to fruits, to see how to combine with the information from Franca Carini in this section.

3.4. Secondary contamination of plants by resuspension (Mr. F. Jourdain)

The contribution was not available for the June meeting, but will be finalized for the end of June. Some few comments from the November meeting should be considered. References should be numbered; tables and figures should be presented in the requested formats.

4. Availability of radionuclides in soil

4.1. Soil-radionuclide interaction (Mr. M. Vidal)

The subsection is nearly finalised.

It is expected some revision of the Vandenhove contribution to the part of the subsection on for U and Ra. Question was raised about the availability of this work for the end of June.

Miquel Vidal repeated that the agreement we had about tables in the TECDOC is to provide: number of data, geometric mean, geometric standard deviation, mean, standard deviation min and max, number of references. The different contributors should follow this rule.

When data is reported from the former TRS, people are asked to put a footnote at the end of the table to clearly specify this.

4.2. Vertical migration (Ms. F. Strebl)

The section is finalized for both the TECDOC and the TRS. For the TRS paragraph about conclusion and recommendation should be removed, only “limitation of use” should be kept.

5. Soil-to-plant transfer *(Ms. N. Sanzharova)*

At this time, the contribution is not finalized, but in a good shape. Nevertheless it is clear that this chapter would take more efforts than others, according to the amount of data to be collected and we wish to thank Ms. N. Sanzharova and her team and also the different contributors to this chapter for their efforts.

Chapter requires more work in terms of harmonisation and revision of the different contribution. The IAEA (NAAL) will take care about finalisation of the chapter by 10th August. Decision was taken to move soil and plant classifications to chapter 2 and dry matter contents of plants and berries in an appendix (n°1). Values have to be given with only two significant numbers.

About the contribution on transfer to fruits from Franca Carini, it is not possible to create a specific chapter or section. Consequently, this contribution will be integrated in the corresponding sections (translocation, root uptake, …)

Tropical and sub-tropical environments. The structure will be kept as it was accepted at the November meeting.

Requests to change some definitions

“Total soil group” has to be changed in “All soils” with a footnote, telling that all categories of soils are included and also unspecified types of soils.

Areal transfer factor. There is a need to replace the term of “areal” transfer factor with another term which could be more appropriate to the process described. This parameter is particularly interesting for the period between ploughing and appearing of the plant on the surface of soil. Another conclusion is also that for the period just after deposition, root uptake is very small compared to foliar uptake.

6. Transfer to animals *(Ms. B. Howard et al.)*

The less developed chapter at the time of the meeting, but nevertheless it is clear that this chapter would take more efforts than others, according to the amount of data to be collected and we wish to thank Ms. B. Howard and her team for their efforts. All Russian data on absorption and transfer has been collected and entered into the database. The section about gut absorption and transfer to milk is nearly finalized. These parts may be finished for end of July. The sections about transfer to meat will not be ready until the autumn. The section on biological half-lives will only be prepared if there is remaining time available re deadlines.

7. Transfer to semi natural environments

7.1. Forest ecosystems (Mr. P. Calmon et al.)

Some further recommendations on how to improve the chapter are given by the group. There are as follows:

— To avoid 10^{-3} just before the unit in the heading of tables, because it could be confusing. It is preferable to be integrated in the value.

— To replace NORM by natural radionuclides and to say that for these radionuclides, the experimental data are not given in the format of Tag.

— To add the number of data and the number of references in all the tables.

— Dr Krasnov and Orlov will provide Russian data for mushrooms and berries for the very beginning of July. They will be added and new geometric mean will be calculated.

7.2 Other natural and semi-natural environments

New contributions to the chapter on radionuclide transfer in Alpine ecosystems were sent by Ms. F. Streble, Mrs. H. Lettner and A. Hubmer.

Dr. Sigurður Emil Pálsson will provide harmonized presentation of the subsection related to Arctic/Antarctic ecosystems at the end of July.

It is necessary to pay attention on possible overlapping between data (some species of game for instance).

8. Freshwater ecosystems

8.1. Run-off from terrestrial environments to river systems (Mr. L. Garcia-Sanchez)

This section has been reviewed many times and is now finalized.

8.2. Physical processes in freshwater ecosystems (Mr. L. Monte)

We wish to sincerely thank Mr. L. Monte and his team for their efforts to provide materials to chapter 8, but it still requires to be amended. Recommendations of the group are as follows:

— It is asked to change the abbreviation “K” for the diffusion coefficient to something different, because K is reserved for distribution coefficient.

— The contribution deals too much with lakes. It is asked to give more attention to rivers and relatively less to lakes. Sea, coastal waters, estuaries are out of the scope of the document, so references from these ecosystems have to be removed.

— It seems that vertical diffusion for rivers is maybe out of use.

— Transport by the current is maybe the most important process for rivers, and should be addressed first.

— Just before table 8.20, the word “absorption” must be changed in sorption or adsorption.

— The table 8.5 should be replaced by a reference to the chapter on freshwater Kds written by Ph. Ciffroy.

— It would be preferable to give only the final equation and not to describe the different scientific steps.

— The different parameters have to be described and values (ideally, geometric mean, geometric standard deviation and range,…) have to be provided.

— Integral equations do not give a simple approach of modelling.

— The table 8.6 is outside of the scope of the TRS

— The version proposed by P. Boyer does not correspond to what is needed for the TRS. The TRS required simple equations and tables of parameter values

As a conclusion, the group proposes that the TECDOC should be rewritten in a more simple way, to be consistent with the other chapters. For instance, the chapter about soil-to-plant transfer does not describe the different mechanistic processes that occur in the soil and in the rooting zone. A macroscopic soil-to-plant transfer factor is used relating directly the radionuclides in the soil to the plants. The group has not the expertise of the freshwater WG, but it seems that the two most important physical processes in rivers are:

(1) Mixing (to write a dilution equation and to take into account the distance from the release and the river width)

(2) Exchange between water and sediment (as presented in fig 8.2, but the main processes have only to be described and the slow and fast compartments are probably too detailed. Only one compartment driven by Kd)

The section should only address the physical processes that occur in rivers and lakes.

8.3 Exchanges between water and particles *(Mr. Ph. Ciffroy)*

The contribution is nearly finalized. It is proposed that Kds are given in the usual way and not as logarithms.

9. Specific activity modelling

Tritium and ^{14}C models. Phil Davis presented the contribution of T and ^{14}C group. The week before, the ^{3}H and ^{14}C Working Group met in Bucharest and discussed this version. A few new modifications of the text have to be made. A new version will be available soon and the contribution will integrate also comments made during our interim meeting. However, this section looks fine and only some details listed below should be modified:

— To add number of observations in the tables.

— To change central value in geometric mean and give the range (min and max)

— To see the consistency of the water content of crops with Chapter 5 section and if correct refer to this information.

— In table 9.11, it could be interesting to have the quantity of stable C by dry weight rather than wet weight, in order to show very little variation.

— In table 9.12, the same

— In 9.2.2.1, a limitation of use could be the site-specificity of the data.

— To release CO_2 from soil into the atmosphere could happen from CH_4 and carbonates with the help of micro-organisms. Incorporation of C via root uptake is negligible in comparison to foliar transfer by photosynthesis.

— Concerning irrigation, to ask Steve Sheppard for information about the use of his model.

— To add a paragraph about gaps and recommendations for further research.

As for ^{36}Cl specific activity models, remarks are as follows:

Since the SA model could not be applied for transfer from soil to plants, it would be relevant to refer to the soil-to-plant section for the transfer parameter values.

— At the end of 9.3.4 paragraph, the sentence about salt should be deleted

— To add the reference Kashparov, 2007 for the work he recently performed

— To send this section to Phil Davis who offered to revise the English

10. Food processing

The chapter is nearly finalized. O. Orlov has offered some data on processing of some forest medical herbs. Such information should be sent within next two weeks to avoid a delay with the chapter finalisation.

Miscellaneous:

(a) Papers for JER special issue

Several papers were received by the date of the meeting. It should be realised that the authors have to submit their papers directly via the ELSEVIER website. The instructions should be sent again, with the minutes, to explain the procedure.

To prepare the reviewing process, a table with the different papers will be prepared and sent with these minutes. It is asked to the different authors to propose 3, 4 or 5 names of potential reviewers for their papers.

Some remarks have been done for some papers:

— "Areal" transfer factors, this term have to be changed as it was advised by the group.

— 2 papers from Hugo Velasco. Only one paper has to be submitted. It is proposed to cancel the one about "soil properties".

— Transfer to animals. Brenda Howard proposed to write only one paper concerning a comparison with the former TRS values.

— Transfer to forests. Due to the difficulty to reduce the forest chapter to 10 pages, two papers would be provided. A possibility to reduce the length of the different papers could be to prepare a comparison with the former TRS.

— Physical processes in rivers. Before to write a paper, it is suggested to have an agreement on the TECDOC.

Generally speaking, authors are asked to respect the maximal number of pages and to reduce the number of references to the most important ones. 1 page for references and for each paper is a maximum.

(b) Important decisions

— We still agree to provide tables with: number of data, geometric mean, geometric standard deviation, mean and standard deviation, min and max, number of references. The different contributors should follow this rule where possible.

— When a data is reported from the former TRS, people are asked to put a footnote at the end of the table to clearly specify that this data comes from the former TRS.

— Decision is taken to put soil and plant classifications in chapter 2 and dry matter contents of plants and berries in an appendix (n°1). Values have to be given with only two significant numbers. It is suitable that each contributor could respect this decision.

— Contributors are asked to avoid 10^{-3} just before the unit in the heading of tables, because it could be confusing. It is preferable to be integrated in the value.

— The databases developed by different contributors will not be provided for a large availability.

References, it is not possible to provide pdf files because of copyright.

Decision is taken:

— for the TECDOC, to put all references used for the databases elaboration, chapter by chapter, in an appendix. Other references which are in the text of the chapters should be given at the end of every chapter.

— for the TRS, to refer to the references in the TECDOC and to refer to a CD that will be provided with the TRS.

(c) TECDOC on web site for extended reviewing.

There was a request from Gordon Linsley at the end of our last (November) combined meeting to put the current draft document on the EMRAS web site. The group considered whether a supplementary review is needed, as this procedure is quite unusual for this kind of publication. The meeting felt that free access to this TECDOC at this stage is not advisable as there could be misuse of the different values. Since a peer-review process is currently organized by the IAEA and for the publications which will be made in a special issue of JER, the group does not feel it is the correct time to put the TECDOC on the IAEA website.

(d) Continuation of the EMRAS project

This topic will be discussed during the last EMRAS combined meeting. It seems to the group that information on time-dependency could be interesting to propose. It is particularly important to identify the different gaps of knowledge to give recommendations for future research. Sergey Fesenko explained that there is also the possibility to organise the IAEA Coordinated Research Projects (CRP) where some research of common interest for the Member States could be financed and such suggestions could be also included into the group recommendations.

(e) Next combined meeting

The next combined meeting will be organized by IAEA in Vienna from the 5th to 9th of November 2007. This meeting will end the EMRAS project. Information and agenda will be sent later by the IAEA.

(f) Deliverables

TECDOC: final versions of contributions should be sent at the end of June or at the end of July 2007 at the latest and only for sections requiring big additions/revision as discussed at the meeting.

TRS: draft contributions should be sent by end of July to prepare edited copy for the November meeting. Review and final draft end of 2007.

JER: papers should be submitted through the ELSEVIER website for end of July or one month after the finalisation of a chapter which paper is related to. Review will be organised in Autumn 2007 .