

Wednesday 24 November 2010 Transfer in the ERICA Tool practical

In this exercise you will explore the effect of changing concentration ratios within the ERICA Tool to investigate the effect that this has on an assessment. You will make use of the common lizard geometry you created during the demonstration session. You will make use of the Tier 2 function in the ERICA Tool to assess the risk to the common lizard from the radionuclides listed in Table 1.

Part a

Open the ERICA Tool and select Tier 2 and move through the input screens to the Assessment Context screen.

- a. Select the terrestrial ecosystem
- b. Select the common lizard geometry
- c. You need to decide how to handle any missing CR values and then enter the media concentrations and record the results of the assessment. Note that the soil is 80% dry matter.
- d. Record the activity concentration in the common lizard.

Table 1

Radionuclide	Soil (Bq/kg dw)	Lizard (Bq/kg)
Am-241	10	
Cs-137	2000	
Mn-54	2	
Po-210	200	
Pu-239	20	
Sr-90	1000	

Part b

In this part you have been provided with an extract from the IAEA transfer handbook which contains relevant reptile concentration ratio values. You should review the information provided in Table 2 and update the CR values in the ERICA Tool if you feel it is appropriate to do so.

Please record any changes you make to the CR values and give a reason why you have opted to change the value and then record the resulting activity concentrations in the common lizard.

Table 2 Extract from the DRAFT IAEA Transfer Handbook of CR values for Reptiles

		Arithmetic Mean	Arithmetic SD	Min	Max	n
Reptile	Am	6.4E-02	3.9E-02	1.0E-03	8.6E-02	16
Reptile	Cs	3.6E+00	1.0E+00	6.0E-04	1.5E+01	137
Reptile	Mn	1.0E-02				1
Reptile	Po	9.5E+00	2.3E+01	1.9E-02	1.1E+01	15
Reptile	Pu	3.3E-03	6.5E-03	1.0E-05	2.0E-02	41
Reptile	Sr	1.2E+01	6.1E-01	2.1E-02	4.2E+01	74

Results table

Radionuclide	What CR value did you use?	Justify CR selection	Predicted Lizard (Bq/kg)
Am			
Cs			
Mn			
Po			
Pu			
Sr			

Part c

Table 3 contains CR data from the IAEA Transfer database for carnivorous reptiles only. The common lizard fits into this group. Repeat the exercise justifying your selection of CR value and recording the activity concentration in the common lizard.

Table 3 Extract from the DRAFT IAEA Transfer Handbook of CR values for carnivorous reptiles

		Arithmetic Mean	Arithmetic SD	Min	Max	n
Carnivorous Reptile	Am	6.4E-02	3.9E-02	1.0E-03	8.6E-02	16
Carnivorous Reptile	Cs	5.2E-01	9.4E-01	6.0E-04	3.0E+00	125
Carnivorous Reptile	Mn	1.0E-02		1.0E-02	1.0E-02	1
Carnivorous Reptile	Po	7.4E-02	7.7E-02	1.9E-02	1.3E-01	2
Carnivorous Reptile	Pu	3.3E-03	6.5E-03	1.0E-05	2.0E-02	41
Carnivorous Reptile	Sr	3.6E-01	5.8E-01	2.1E-02	1.2E+00	70

Results table

Radionuclide	What CR value did you use?	Justify CR selection	Predicted Lizard (Bq/kg)
Am			
Cs			
Mn			
Po			
Pu			
Sr			