

Appendix 1: Risk assessment template for work with radioactive collections

<p>MUSEUM NAME</p> <p>Radiation Risk Assessment</p> <p>as required by the Ionising Radiations Regulations 2017</p>
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<p>Description of work assessed: Briefly describe the task being assessed</p>	<p>Reference: (if applicable)</p>
<p>Location of work:</p>	<p>Planned start date:</p>
<p>Name of assessor/worker:</p>	<p>Review date:</p>
<p>Post/Status:</p>	<p>Signature:</p>

A	People affected	
1	Museum employees directly involved in the work:	
2	Non-Museum employees directly involved in the work (agree on responsibilities of the employers involved):	
3	Others who may be affected by the work (other staff, visitors, students):	
4	Any pregnant or breastfeeding persons involved in the work. Please inform your line manager as soon as possible if this risk assessment indicates that there is a risk to the foetus or nursing infant	

B	Type and amount of radiation involved (review annually and as needed)	
1	Radionuclide, type of radiation and activity (in MBq) per procedure	Include all the objects involved in the work
2	Type of dosimetry to use, if any	Seek advice from the RPA
3	Type of contamination monitor to use	Seek advice from the RPA
4	Number of procedures carried out annually Keep under review and minimise	
5	Exposure time during one procedure (in hours) Include time for waste handling (if applicable)	
6	Maximum annual exposure time (in hours) Use for dose estimate below	

C Annual whole body dose estimate		
	Refer to data in Delacroix, D., Guerre, J.P., Leblanc, P. and Hickman, C., 2002, Radionuclide and radiation protection data handbook, Radiation Protection Dosimetry Vol 98 no. 1 Nuclear Technology Publishing Ashford, Kent.	
1	Deep tissue dose 30 cm from source, unshielded	Calculate exposures as described in Section 4.c mSv/year
2	How does this figure compare with the whole body effective dose limit and with natural doses?	Results from this will determine the control measures used to reduce exposure – see section I below

D Annual extremities and skin dose estimates		
1	External hand contact dose (consider realistic handling times)	Calculate exposures as described in Section 4.c mSv/year
2	How does this figure compare with the extremity dose limit?	For example as a percentage. Results from this will determine the control measures used to reduce exposure – see section I below
3	Skin dose at 30 cm from source	Calculate exposures as described in Section 4.c mSv/year
4	How does this figure compare with the skin dose limit?	For example as a percentage. Results from this will determine the control measures used to reduce exposure – see section I below

E Accident scenarios from ingestion, inhalation or skin contamination		
1	Internal radiation (Ingestion). Estimate 1% from one procedure	Calculate exposures as described in Section 4.c mSv
2	Internal radiation (Inhalation). Estimate 1% from one procedure – even if not normally volatile	Calculate exposures as described in Section 4.c mSv
3	E1 + E2 Total accidental internal dose estimate	mSv
4	How does this figure compare with the whole body effective dose limit and with natural doses?	Results from this will determine the control measures used to reduce exposure – see section I below
5	Undetected skin contamination Estimate 1% from one procedure remaining on the skin for one hour	Calculate exposures as described in Section 4.c mSv
6	How does this figure compare with the skin dose limit?	Results from this will determine the control measures used to reduce exposure – see section I below

F Previous exposures in the last year, if applicable		
	This section records the cumulative dose of radiation to staff from different activities – check records and include all procedures done in the same year	
1	Whole body dose (use dosimetry results if applicable)	mSv/year

2	Hand dose (use dosimetry results if applicable)	mSv/year
3	Other dosimetry/monitoring (if applicable)	

G	Waste: Please justify the work you are planning to undertake considering BAT (Best Available Technique) with the aim of minimising the environmental impact.	
1	Has the RWA been consulted. If not please justify.	The RWA must be consulted regarding any significant new work or if setting up a new work area
2	How will the waste be minimised?	<input type="checkbox"/> Using minimum amounts of materials and tools which will need to be disposed of <input type="checkbox"/> Avoiding secondary waste through contamination of equipment/work areas
3	Expected waste routes	Check with the RPW to ensure waste is disposed of correctly and is properly recorded
4	Solid waste	MBq per procedure
5	Other waste – please specify:	MBq per procedure
6	Is the proportion of waste going to the above routes measured, calculated or estimated?	

H	Contingency planning/accident scenario Consider staff and others who may be affected (including members of the public if applicable)	
1	What are the most likely accident/incident scenarios? Consider human error and technical failures (including failures of control measures). Specify likely doses to anyone if greater than those estimated above.	
2	Who will be affected (staff/ public)?	
3	Key contacts	Include RPS and RPA contact information
4	Brief outline of steps to take in the event of an accident (e.g. breakage, skin contamination etc.)	
5	Is additional training required by any staff? (give details)	

I Control measures to minimise exposure and prevent accidents		
1	Designation of area proposed for this work: non-designated, supervised or controlled?	
2	What warning signs and demarcation are in place?	
3	Written arrangements (i.e. System of Work) for controlled areas?	
4	Access arrangements for controlled areas?	
5	What training is required and how is training for new/existing users recorded?	
6	How are principles of time and distance applied in practice?	i.e. what procedures are used to reduce exposures by minimising time spent on the work and the distance of the worker from the objects
7	List likely sources of contamination (airborne and/or surface) and preventative measures	
8	Measures to minimise spread of contamination from the work area including monitoring arrangements	
9	Required radiation shielding	Unlikely for most museum objects
10	Other engineering controls (Perspex screen, glove box)	Unlikely except for conservation treatments
11	Personal Protective Equipment (PPE) – list all required	
12	Additional Precautions for those handling solid waste (if applicable)	
13	Additional precautions/ for pregnant or breastfeeding staff. If none, state why – consider even if situation not expected.	
14	Any additional actions needed to ensure doses are kept as low as reasonably practicable	
15	Has RPA advice been sought? Necessary for any significant new work or if setting up a new work area	

J Effectiveness of control measures		
With control measures in place, is it likely that the following groups could receive <i>significant</i> doses? If yes, please specify and consult RPA		
1	Anyone directly involved in the work, whole body dose over 2 mSv/year?	
2	Anyone directly involved in the work, hand/skin dose over 50 mSv/year?	

3	Anyone NOT directly involved in the work, whole body dose over 0.3mSv/year?	
4	Likelihood of accident – High, medium or low if above control measures are used:	

K	Additional risks and control measures: refer to separate risk assessments or add details of significant risks and control measures to this assessment. Consider all hazards associated with the work: e.g. chemical hazards, manual handling etc.

<u>Assessment Agreed</u>
Supervisor/ line manager: Name:
Date: Signature:
RPS: Name:
Date: RPS Signature:
Specify a revision date for this assessment
Review on or before
Ensure that the assessor and Supervisor are aware that <u>re-assessment</u> will also be required for any significant change in this work, for instance, changed activity limits or different category of workers (including pregnancy).