

# University of Cambridge – initial assessments for exposure to naturally occurring radon in basement areas

This document provides advice on initial assessments for radon exposures in occupied basement areas across University of Cambridge sites. Note that this document does NOT cover radon exposures which result from storage of items such as radium dials and naturally occurring minerals in museum collections (although advised control measures may be similar).

## Introduction

Radon gas is a daughter product of certain radioactive materials which occur naturally in the ground and in building materials. Radon gas can accumulate in poorly ventilated basement rooms. The Cambridge area is not considered to be in a “radon affected area” as the risk is low, but higher concentrations are very occasionally found in poorly ventilated basement rooms. Significant radon concentrations are not expected in rooms at or above ground floor level and therefore these areas do not need to be assessed. From previous measurements, typical concentrations found in well-ventilated rooms across the University are 20-30 Bq/m<sup>3</sup>. This is well below the action value of 300 Bq/m<sup>3</sup> (as an annual average) under the Ionising Radiations Regulations 2017 (IRR17).

Assessments and measurements are required in occupied basement areas even in non-radon affected areas. “Occupied areas” are defined as individual occupancy of more than 50 hours per year. Radon assessments were previously done by qualitative assessments and measurements were only carried out for higher risk areas, but HSE have since stated that measurements are needed as part of the assessment of all occupied basement areas. HSE continue to expect radon assessments to be carried out every 10 years or so, but if there are significant changes to occupancy or to ventilation of any basement areas, please review the initial assessment and contact the Radiation Protection (RP) team at the Safety Office for assistance and advice.

Note that the average concentration is the value for assessment of risk and needs to be assessed over a reasonable period (preferably a week or two for an initial assessment followed by further measurements if advised). Radon levels can fluctuate significantly on an hourly basis but please contact the RP team if any concerns.

## What Departments need to do

Identify any occupied basement areas in your buildings and contact the RP team at the Safety Office if you have any rooms that may meet this description. The RP team at the Safety Office will assist with monitoring as needed. You will need to make a record of the assessment, act on any RPA advice from the Safety Office and keep the assessment under review. The Safety Office will send out periodic requests for information on occupied basement areas and assessments to help keep this issue under review.

## Radon measurements

Depending on availability, initial radon measurements can be made using the Safety Office’s radon monitor (RadonEye<sup>1</sup>).

Alternatively passive monitors (“workplace pack”) can be obtained from UKRadon <https://www.ukradon.org/services/orderworkplace>.

Whether the RadonEye or passive detectors are used:

- Please instruct users of the room not to tamper with, remove or move the detectors.
- The detector should be positioned in the breathing zone, height between 1-2 meters and 1m away from any walls. The RadonEye detector needs mains power, so use an extension cable if necessary.
- Do not put any detector on a windowsill, by a door or other locations of higher air flow.
- Follow the UKRadon instructions for the passive detectors, and these should be firmly fixed (e.g. by cable tie).
- The room should continue to be used as normal during the measurements. A locked, unused room will show a higher reading than when in use.

## Review of data and further advice

The RP team at the Safety Office will review readings and advise as needed taking into account occupancy of the room. We may advise on further measurements with approved, passive radon detectors which need to stay in place for 3 months (from UKRadon).

Remedial measures should ensure the room is safe for all foreseeable continued use and occupancy. Measures would normally include improved ventilation as a first step. Room access will need to be monitored until measures are installed and shown to be effective.

### *<sup>1</sup>Further information on use of the RadonEye*

*The sensor of the RadonEye detector measures alpha radiation from the decay of radon in the air. Any other radiation or electromagnetic waves in the vicinity will not affect the reading. The sensor is sensitive to vibration so must be placed away from sources of vibration.*

*The RadonEye detector will provide a first reading within 10 min and will display the current reading on a small LCD screen on top of the device.*

*The detector will not record the time of day, but will electronically successive hourly averages from the time it is connected to the mains supply. Keep a note of the start time to correlate readings with the time of day.*

*To download and view measurements, connect a phone via Bluetooth using the free Radon Eye app (NOT Radon Eye Plus or Pro) or Safety Office staff will do this if preferred.*

HSD217R

## Initial radon assessment record – University of Cambridge basement areas only

|                                                                                                                                                                                                                                             |  |                         |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------|--|
| <b>Department/building/address/building number:</b>                                                                                                                                                                                         |  | <b>Assessment Date:</b> |  |
| <b>Departmental contact carrying out the initial assessment</b><br><b>Role:</b> _____ <b>Print name and sign:</b> _____                                                                                                                     |  |                         |  |
| <b>Room reference – basement/sub-ground room number:</b><br>Use second form if needed                                                                                                                                                       |  |                         |  |
| <b>Room use:</b><br>consider current use<br>(review occupancy below if room use changes)                                                                                                                                                    |  |                         |  |
| <b>Expected average occupancy of room:</b><br>More than 1 hour per week or 50 hours per year?                                                                                                                                               |  |                         |  |
| <b>Approximate location of monitor (describe):</b>                                                                                                                                                                                          |  |                         |  |
| <b>Date and time of first measurement:</b>                                                                                                                                                                                                  |  |                         |  |
| <b>Date and time of last measurement:</b>                                                                                                                                                                                                   |  |                         |  |
| <b>Average measurement (Bq/m3):</b>                                                                                                                                                                                                         |  |                         |  |
| <b>RPA advice</b><br><br><b>Further action needed?</b> Yes      No<br><br><b>Advised actions:</b><br><br><b>Name / date:</b> _____                                                                                                          |  |                         |  |
| <b>Departmental confirmation that actions noted above are (delete as applicable)</b><br><br><div style="text-align: center;">In progress   /   Completed</div><br><br><b>Further details if applicable</b><br><br><b>Name / Date:</b> _____ |  |                         |  |
| <i>Departmental Safety Officer must return completed copy to the Safety Office, retain a copy of this for Departmental records and review if room use or ventilation significantly changes</i>                                              |  |                         |  |