## Contents

<ul><li>1. Introduction 7</li><li>1.1. Properties and behaviour of radon and its progeny 7</li><li>1.2. Geological overview 7</li></ul>
2. Brief history of Radon Programme in the Czech Republic 10
3. Methods of measurements 11 3.1. Instantaneous measurements 11 3.1.1. Soil gas sampling 11 3.1.2. Determination of soil gas radon concentration 12 3.1.3. Observed variations 14 3.2. Integral and continual measurements 15 3.3. Intercomparison measurements 15
4. Instrumentation 16 4.1. Scintillation method 16 4.2. Ionization chambers 17 4.3. Continual measurement of soil gas radon concentration 18
5. Permeability of soils 19 5.1. Permeability in the original method 19 5.2. Changes in the period 1994–2004 20 5.3. Permeability in nowadays practice 23 5.4. RADON-JOK 24 5.5. Permeability units 25
<ul> <li>6. Building site assessment method 25</li> <li>6.1. Original method 1990 25</li> <li>6.2. Modified method 1994 26</li> <li>6.3. Research project 2000–2002 26</li> <li>6.4. New method for assessing the radon risk of building sites 2004 27</li> <li>6.5. Verification of the new method for radon index assessment 28</li> <li>6.6. Comparison of large scale radon risk maps and results of detailed in situ measurements 29</li> </ul>
7. Mapping of radon index 30 7.1. Purpose of radon risk maps 30 7.2. Radon database 31 7.3. Scales of mapping 31 7.3.1. Scale 1: 200 000 31 7.3.2. Scale 1: 500 000 32 7.3.3. Scale 1: 50 000 34 7.4. Radon index maps 1: 50 000 – method of processing 34 7.5. GIS and internet applications for radon risk mapping – CD-ROM and Map server 35
8. Statistics of radon in the rock types 36 8.1. Magmatic and volcanic rocks 38 8.2. Metamorphic rocks 40 8.3. Sedimentary rocks 42
<ul> <li>9. Radon and tectonics 44</li> <li>9.1. Influence of tectonics in the crystalline and Proterozoic bedrock 44</li> <li>9.2. Soil gas radon and distance from the faults 44</li> <li>9.3. Indoor radon and tectonics in low radon index areas 46</li> <li>9.4. Radon and tectonics in the SE part of the Bohemian Massif 47</li> </ul>
10. Geostatistical methods for radon risk evaluation 48

10.1. Radon risk derived from geological basement 49

11. Comparison of radon in soil gas and indoor radon 56	
11.1. Method and data sources 56	
11.2. Pilot study of soil gas and indoor radon correlations 56	
11.3. Comparison in Central Bohemian Plutonic Complex 57	
11.4. Comparison of soil gas Rn and indoor Rn in Domažlice and Prachatice districts 59	
11.5. Radon profile across the major granitoid bodies 59	
11.6. Indoor and soil gas Rn in major rock types of the Czech Republic 61	
11.7. Soil gas Rn and indoor Rn comparison based on gamma dose rate categories 61	
11.8. Indoor radon in municipalities related to radon index from bedrock 62	
11.9. Percentage of radon index categories within the municipalities 63	

50

10.2. Spatial evaluation of radon risk based on administrative units10.3. Grid methods for expressing the radon risk 53

**Conclusions** 65

10.4. Combined methods 55

References 66