



SAFEGROUNDS

Approach to managing contaminated land on nuclear-licensed and defence sites – an introduction

D Collier

P Towler

Participation (by organisations or individuals) in the SAFEGROUNDS project must not be taken as an indication of either support for or disagreement with the content of this guidance in its entirety. This is the first version of the guidance and it is not yet tried and tested. It is intended that the guidance will be revised at intervals, taking into account experience in using it and regulatory and other changes



Classic House, 174–180 Old Street, London EC1V 9BP
TEL: +44 (0)20 7549 3300 FAX: +44 (0)20 7253 0523
EMAIL: enquiries@ciria.org WEBSITE: www.ciria.org

SAFEGROUNDS Approach to managing contaminated land on nuclear-licensed and defence sites – an introduction

Collier, D, Towler, P

CIRIA

CIRIA W27

© CIRIA 2009

RP767

<p>Keywords</p> <p>Contaminated land, environmental good practice, ground improvement, ground investigation and characterisation, health and safety, <i>in situ</i> testing and instrumentation, nuclear, site management, sustainable construction</p>	
<p>Reader interest</p> <p>This guidance has been developed primarily for site owners, site operators and their contractors. It is also addressed to governmental and non-governmental organisations and other groups within the public</p>	<p>Classification</p> <p>AVAILABILITY Unrestricted</p> <p>CONTENT Guidance</p> <p>STATUS Committee-guided/ Stakeholder dialogue</p> <p>USER Site owners, site operators, contractors, governmental departments, local authorities, regulators, NGOs, and other groups within the public</p>
<p>Version control</p>	
<p>Document title:</p> <p>Version and date:</p> <p>Primary author:</p> <p>Prepared for:</p> <p>History:</p> <p>Status:</p>	<p>SAFEGROUNDS <i>Approach to managing contaminated land on nuclear-licensed and defence sites – an introduction</i></p> <p>Version 1, May 2009</p> <p>D Collier, prepared by Faulkland Associates and Enviros</p> <p>SAFEGROUNDS Learning Network</p> <p>First issue. Output of stakeholder dialogue</p> <p>The front pages were reformatted in March 2009 for consistency across the SAFEGROUNDS documents</p> <p>SAFEGROUNDS good practice guidance document, prepared with the SAFEGROUNDS Project Steering Group</p> <p>This is a live document, subject to revision. Freely available web publication</p>

Published by CIRIA, Classic House, 174–180 Old Street, London EC1V 9BP, UK.

This publication is designed to provide accurate and authoritative information on the subject matter covered. It is sold and/or distributed with the understanding that neither the authors nor the publisher is thereby engaged in rendering a specific legal or any other professional service. While every effort has been made to ensure the accuracy and completeness of the publication, no warranty or fitness is provided or implied, and the authors and publisher shall have neither liability nor responsibility to any person or entity with respect to any loss or damage arising from its use.

All rights reserved. This document is freely available to download, however if you wish to use any part of the document, such as the figures, text or technical information for reproduction elsewhere (in other documents or publications), please contact the Publishing Department for more details on copyright terms and charges at: publishing@ciria.org or tel: +44 (0) 20 7549 3300.

Summary

This is an introduction to a suite of good practice guidance documents aimed at organisations that are responsible for managing contaminated land on nuclear-licensed and defence sites, but it will also inform other stakeholders. The key principles and a recommended process for managing contaminated land are presented. Detailed technical information is not included, as there are references to other documents, where necessary.

Acknowledgements

Authors

This report was prepared by Faulkland Associates and Enviros under contract to CIRIA, between early 2007 and December 2008, for the SAFEGROUNDS Learning Network. The principal author was D Collier assisted by P Towler.

Project Steering Group

The SAFEGROUNDS project was guided by a Steering Group comprising of project funders and regulatory and policy-making stakeholders. CIRIA and the research contractors wish to express their appreciation for the technical guidance and support given by the Group during the project and in their additional review of drafts of the guidance. The members of the Group during the production of this report were:

Sean Amos	Atomic Weapons Establishment
Dave Bennett	Environment Agency
Peter Booth*	National Nuclear Laboratory
Richard Bramhall*	Low Level Radiation Campaign
Anna Clark	Nuclear Decommissioning Authority
Julian Cruickshank	Sellafield Ltd
Ray Dickinson	Defence Estates
Paul Dorfman*	University of Warwick
Joanne Fisher	Nuclear Decommissioning Authority
Bob Gardner	Ministry of Defence
Colette Grundy	Environment Agency
Ian Hall	Scottish Executive
Dick Haworth	Health & Safety Executive
Mark Hill	Defence Estates
John Kelly	Oxfordshire County Council
Shelly Mobbs	Health Protection Agency
Stephen Moreby	Gloucester City Council
Mike Pearl*	United Kingdom Atomic Energy Authority
George Reeves	North Highland College
Hugh Richards	Magnox Electric North
Colin Rogers	Parents Concerned About Hinkley
Adam Stackhouse	Scottish Environment Protection Agency
Andy Thomas (chairman)	Future Solutions
Gemma Urquhart	British Energy
Stephen Wilmott	Magnox Electric South
Jamie Woolley	UK Nuclear Free Local Authorities

* Also member of the project team, which provides detailed support for the management of the process of the network.

CIRIA's research managers for this project were Mr Jeff Kersey, Mr Mark Bentley and Miss Rajnika Patel, assisted by Miss Gemma Samlal under the direction of Dr Owen Jenkins.

CIRIA, on behalf of all those involved in preparing this guidance, would like to thank everyone who participated in the SAFEGROUNDS project.

Contents

Summary	3
Acknowledgements	4
Figures	6
1 SAFEGROUNDS	7
1.1 Introduction	7
1.2 SAFEGROUNDS Network	7
1.3 Guidance	7
1.4 Contaminated land	8
1.5 Nuclear-licensed sites	9
1.6 Non-nuclear defence sites	10
1.7 Contaminated land regulation	10
2 SAFEGROUNDS key principles	12
2.1 Principle 1: Protection of people and the environment	12
2.2 Principle 2: Stakeholder involvement	13
2.3 Principle 3: Identifying the preferred land management option	14
2.4 Principle 4: Immediate action	14
2.5 Principle 5: Record-keeping	15
3 The SAFEGROUNDS process	16
3.1 Does SAFEGROUNDS process apply?	16
3.2 Assess risks, implement and validate immediate controls	16
3.3 Refine strategy and prioritise areas	18
3.4 Generic and detailed quantitative risk assessment	18
3.5 Appraisal of remedial options	18
3.6 Implementation of strategy	19
4 Stakeholder involvement	20
4.1 SAFEGROUNDS approach to stakeholder involvement	20
4.2 Meaning of proportionality	20
4.3 Designing the process	21
5 Involvement opportunities	23
5.1 Policy development	23
5.2 Statutory sources of site-specific information and consultation	23
5.3 Civil nuclear sites	24
5.4 Site stakeholder groups	24
5.5 Defence sites	25
5.6 NGOs	25
6 Contacts and information	26
6.1 Government	26
6.2 Regulators	28

6.3	Local authorities	30
6.4	Industry	30
6.5	Non-governmental organisations	31
6.6	Campaign groups	32
6.7	Other information sources	32
6.8	Useful guides, documents and websites	33
	Glossary	35
	Acronyms and symbols	43
	Figures	
Figure 1.1	Principle types of human exposure pathway associated with working on radioactive contaminated land	9
Figure 3.1	SAFEGROUNDS Decision flow diagram	17

1 SAFEGROUNDS

1.1 Introduction

This introduction has been published in response to requests from community groups for an overview of the principles (Chapter 2) and processes (Chapter 3) which underpin the guidance and the approach it recommends to decision making and community involvement. It provides local communities, other stakeholders and the wider public with an introduction to the topics covered by the main guidance (particularly stakeholder involvement, Chapter 4) and included links to supporting documents. It also suggests how interested members of the community can get involved in decision making and site monitoring activities (Chapter 5).

All abbreviations and acronyms are listed in the back of this guide.

SAFEGROUNDS covers radioactive, non-radioactive and mixed radioactive contamination, but this introduction reflects stakeholders' priorities and concentrates on radioactively contaminated land. It is not, however, intended as an introduction to radioactivity, radioactive contamination or radioactive waste - advice on sources of information about these topics is given in Chapter 6.

1.2 SAFEGROUNDS Network

SAFEGROUNDS stands for SAFety and Environmental Guidance for the Remediation of UK Nuclear and Defence Sites

The SAFEGROUNDS network is a forum for developing and sharing good practice in the management of land with radioactive, non-radioactive and mixed contamination on nuclear-licensed sites and on defence sites where legacy radioactive contamination is present.

SAFEGROUNDS guidance is primarily aimed at organisations responsible for the management of contaminated land but is also designed to inform other stakeholders about good practice. It was developed with input from a wide range of stakeholders but their participation does not necessarily mean that they agree with everything in the guidance. SAFEGROUNDS guidance has no legal standing so it is not binding.

1.3 Guidance

See main guidance:
SAFEGROUNDS *Good practice guidance for the management of contaminated land on nuclear-licensed and defence sites* (version 2)
<www.safegrounds.com/guidance.htm>

The SAFEGROUNDS *Land management guidance* (version 2) (LMGv2) is the main SAFEGROUNDS guidance with detailed supporting guides and technical papers on specific topics. These supporting documents have been reviewed and updated to be consistent with the 2009 version of the main SAFEGROUNDS guidance. They are all available for free download from: <www.safegrounds.com>.

SAFEGROUNDS guidance documents

COLLIER, D (2005a) *Community stakeholder involvement*, W16, CIRIA, London

COLLIER, D (2009c) *Approach to managing contaminated land on nuclear-licensed and defence sites – an introduction*, W27, CIRIA, London

HILL, M, PENFOLD, J, HARRIS, M, BROMHEAD, J, COLLIER, D, MALLET, H and G SMITH (2002) *Good practice guidance for the management of contaminated land on nuclear and defence sites*, W13, CIRIA, London

HILL, M, PENFOLD, J, WALKER, R, EGAN, M, COLLIER, D, ESLAVA-GOMEZ, A, KRUSE, P, RANKINE, A and TOWLER, P (2009a) *Good practice guidance for the management of contaminated land on nuclear-licensed and defence sites*, version 2, W29, CIRIA, London

PENFOLD, J (2009) *Guide to the comparison of contaminated land management options*, W28, CIRIA, London

SMITH, G (2005) *Assessments of health and environmental risks of management options for contaminated land*, W15, CIRIA, London

TOWLER, P A, RANKINE, A, KRUSE, P and ESLAVA-GOME, A (2009) *Good practice guidance for site characterisation*, W30, CIRIA, London

SAFEGROUNDS information papers

HILL, M D (2005a) *Briefing note on the Energy Bill*, W19, CIRIA, London

HILL, M D (2005b) *The regulatory framework for contaminated land on nuclear-licensed sites and defence sites*, version 4, W17, CIRIA, London

SMITH, G M (2005) *Review and commentary on site end-points and radioactively contaminated land management*, W20, CIRIA, London

1.4

Contaminated land

For more information on radioactivity in the environment, see the SAFEGROUNDS site characterisation guidance document:

Good practice guidance for site characterisation.

Download from www.safegrounds.com/guidance.htm

The term contaminated land is used in SAFEGROUNDS guidance in a general way and means any land in, on or under which there are radioactive or non-radioactive contaminants at levels above the natural and artificial background levels, and are typical of the area of the UK in which the site is located. This definition is broader than the statutory definition in Part 2A of the Environmental Protection Act 1990, which applies only to land in its current use (including any use where planning permission has been granted), and reflects the intention of the Part 2A regime to focus on sites with the potential to give rise to the highest risks to people and the environment. The broader definition is employed to cover all cases where the presence of legacy contaminants is or could be a cause for concern to the owners or operators of the site, the regulators and other stakeholders.

Radioactive contamination may occur from radioactive gases, liquids or particles. Radioactive contamination is typically the result of an uncontrolled release such as a spill or accident during the production or use of radioactive material. Radioactive contamination may also be an inevitable result of natural processes or human activities, such as historical discharges from nuclear facilities. Radioactive material in controlled, sealed and designated containers is not referred to as contamination and SAFEGROUNDS guidance covers only contaminated land, not other types of contaminated material. Radioactively contaminated land, when it is excavated, is classed as radioactive waste and needs to be managed according to the activity present.

For information on potential health effects, refer to the *Health Protection Agency* website.

For an alternative view, see the *Low Level Radiation Campaign* website.

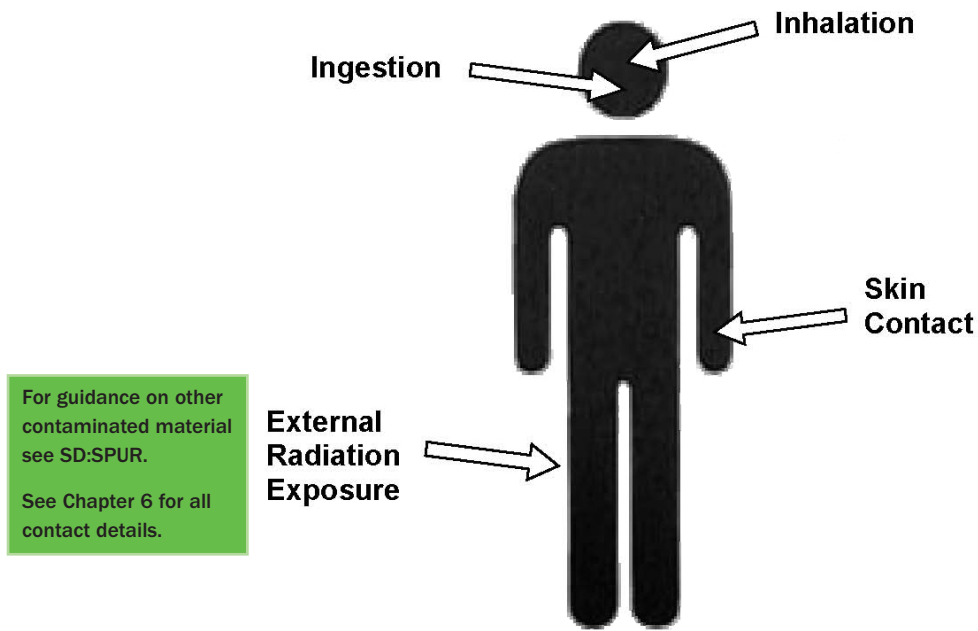
See Chapter 6 for all contact information.

The risks to people and the environment from radioactive contamination of land depend on the nature of the radioactive contaminant itself (the hazard), and the pathway along which the contamination migrates or reaches receptors (people and the environment). The level of risk is based on consideration of both:

- the likelihood of an event (probability – taking into account both the presence of the hazard and receptor and the integrity of the pathway)
- the severity of the potential consequence (taking into account both the potential severity of the hazard and the sensitivity of the receptor).

There are significant differences of opinion about interpreting the severity of the

hazard and the sensitivity of the receptor, and consequently the danger from different levels of contaminant.



For guidance on other contaminated material see SD:SPUR. See Chapter 6 for all contact details.

Figure 1.1 Principle types of human exposure pathway associated with working on radioactive contaminated land

1.5 Nuclear-licensed sites

Nuclear-licensed sites include civil nuclear sites that are being used for electricity generation or other purposes, defence nuclear sites that are being operated for the Ministry of Defence by contractors, and nuclear sites that are being decommissioned. Contaminated land may be found on all types of sites.

Most of the radioactive contamination on such sites is from past licensed activities and has been there for years or decades. Non-radioactive contamination might be present from past, non-nuclear use (for example several nuclear-licensed sites were used for military purposes before nuclear installations were built on them). Now industrial-type activities may also lead to non-radioactive contamination such as hydrocarbon spills.

www.hse.gov.uk/nuclear/licensees/pubregister.pdf

The main civil sites are owned by either British Energy (BE) or the Nuclear Decommissioning Authority (NDA). Other licensees are listed on the Health and Safety Executive (HSE) website.

British Energy owns and runs the operating nuclear power stations at Dungeness B, Hinkley Point B, Hartlepool, Heysham 1 and 2, Hunterston B, Sizewell B and Torness. The NDA is responsible for the UK's historic nuclear legacy, which includes all the older Magnox power stations (whether operating or decommissioning), the Sellafield complex, the research sites at Harwell, Dounreay, and Winfrith, the fuel manufacturing facilities at Capenhurst and Springfields, and the low level waste repository (LLWR) near the village of Drigg. The sites themselves are operated by Site Licence Companies (SLCs) under contract to the NDA.

Contact details for all the organisations mentioned here are given in Chapter 6.

The main nuclear-licensed sites being operated for the Ministry of Defence (MoD) by contractors are the dockyards at Devonport and Rosyth, the Vulcan Naval Reactor Test Establishment at Dounreay, and the Atomic Weapons Establishment (AWE) sites at Aldermaston and Burghfield.

1.6

Non-nuclear defence sites

Low level radioactive contamination may also be present as a result of the historical production, maintenance, storage and disposal of luminised instruments, such as compasses that were used in vehicles, aircraft and on board ships. The peak period for luminising was from the 1930s to the 1970s. In the late 1950s there were 37 factories registered in the UK under the Luminising Regulations 1947 to carry out luminising works of which 14 were owned by the MoD. The luminising paint used originally contained radium though more recently promethium and tritium were used. The contamination if present is associated with paint spillages, the storage of instruments and disposal of redundant equipment. In keeping with practices of the time these materials were often burnt and/or buried and the ashes dispersed.

The MoD has a continuing programme of land quality assessment, which is co-ordinated by Defence Estates, the organisation responsible for the management of the MoD estate.

1.7

Contaminated land regulation

See main guidance:

SAFEGROUNDS Good practice guidance for the management of contaminated land on nuclear-licensed and defence sites (version 2)
<www.safegrounds.com/guidance.htm>

As expected the management of contaminated land is tightly regulated. The prime responsibility for the safe and environmentally responsible management of contamination, radioactive waste and discharges lies with the site operator. The principles by which these are regulated are common to all sites. However, there are differences in the regimes under which radioactively and non-radioactively contaminated land on nuclear-licensed sites and defence sites in the UK are managed.

The main SAFEGROUNDS guidance gives an outline of these regimes, with full details in a supporting report. Broadly speaking:

More detailed information on regulation is contained in the SAFEGROUNDS guidance document:
The UK Regulatory Framework for contaminated land on nuclear-licensed sites and defence sites.
Download from
<www.safegrounds.com/guidance.htm>

For nuclear-licensed sites

- on all sites licensed under Nuclear Installation Act 1965 and those managed by MoD according to this Act, radioactive land contamination is regulated by the Nuclear Installations Inspectorate (NII) until the site (or relevant part) has been fully remediated and delicensed. Internal MoD regulators provide this function on certain sites
- under the Environmental Protection Act 1990 Part 2A local authorities are required to identify non-radioactive contaminated land on nuclear-licensed sites and associated land. Where a nuclear-licensed site is classified as non-radioactively contaminated, then it will be treated as a Special Site and the enforcing authority becomes the NII.

For non-nuclear defence sites

- where the current use of land contaminated with radioactive or non-radioactive contamination may allow prolonged exposure to humans above certain defined levels, the local authority can determine it as contaminated land. The appropriate person is then required to clean it up, and this is controlled under the Environmental Protection Act 1990 Part 2A
- if land with radioactive or non-radioactive contamination is going to be redeveloped it is the responsibility of the developer to control the risks to occupants and users of the proposed development by adherence to regulations under the planning regime.

On both types of site

- cleaning up radioactively contaminated land is likely to result in the accumulation of radioactive material, which is regulated on licensed sites by the NII, and elsewhere by the relevant environment enforcement authority. The disposal of radioactive waste must be authorised by the Environment Agency (EA) or its equivalents in the devolved administrations and Northern Ireland before the work starts. Such work is controlled on nuclear-licensed sites under site licence conditions and safety assessment principles (SAPs) and on other sites under the Radioactive Substances Act 1993 (RSA 93)
- the MoD is not subject to RSA 93 but has in place administrative arrangements at defence sites that are not nuclear-licensed sites to achieve the same standard of control.

See Chapter 2 of the main guidance:

SAFEGROUNDS Good practice guidance for the management of contaminated land on nuclear-licensed and defence sites (version 2)
<www.safegrounds.com/guidance.htm>

A wide range of stakeholders worked together to agree the five SAFEGROUNDS key principles for the management of contaminated land on nuclear-licensed and defence sites. They are complementary and apply at various stages in land management. They are presented in the order of priority agreed by the stakeholders as follows:

Principle 1 Protection of people and the environment

Principle 2 Stakeholder involvement

Principle 3 Identifying the preferred land management option

Principle 4 Immediate action

Principle 5 Record-keeping

The rest of this section explains what these principles mean in practice. The cross references are to the main SAFEGROUNDS guidance.

2.1

Principle 1: Protection of people and the environment

See Section 2.1.1 of the main SAFEGROUNDS guidance.

The fundamental objective of managing contaminated land on nuclear-licensed sites and defence sites should be to achieve a high level of protection of people and the environment, now and in the future.

This is the first and most fundamental objective of any contaminated land programme. Civil nuclear and defence sites are tightly regulated and radioactively and chemically contaminated land is covered by a wide range of legislation. Protection of people covers the health and well-being of the public and workers. The environment includes land, water (including groundwater), air, plants and animals, crops, buildings and sites of historical and cultural importance.

There is no single definition of a high level of protection. Regulatory frameworks set certain limits but these are minimum standards and owners/operators are required by regulation to do more, until the cost involved in reducing the risk further would be grossly disproportionate to the benefit gained. Safety regulators refer to this principle as low as reasonably practicable (ALARP).

SAFEGROUNDS guidance documents propose a case-by-case approach to contaminated land management with stakeholder involvement. This will include assessment of the impact of any waste arising to avoid unacceptable transfer of risk from one area or group to another.

Account also needs to be taken of important scientific uncertainties that have the potential to impact what is held reasonable in terms of ALARP. Different stakeholder views need to be recognised and explicitly considered in the decision making process.

The main SAFEGROUNDS guidance document explains how this Principle is achieved through regulation of contaminated land and through application of good management practice.

2.2

Principle 2: Stakeholder involvement

See Section 2.1.2 of the main SAFEGROUNDS guidance.

Site owners/operators should involve stakeholders in the management of contaminated land particularly to inform decision making.

Stakeholders are all those interested in the management of the contaminated land. They include institutional stakeholders, such as regulators, local and national government, and others who could be affected by, or have a direct interest in, land management decisions, such as employees, local residents, community-based organisations (CBOs) and non-governmental organisations (NGOs). Key individuals within the owner's/operator's organisation will also be involved as stakeholders.

The intent of Principle 2 is for effective stakeholder involvement in the decision making process, whether or not it is required by organisational policy or regulatory frameworks. The aim is not just to satisfy stakeholder expectations, but also to be useful input into the process demonstrating the effectiveness of stakeholder contributions within the decision making process, and to make better and lasting decisions.

Stakeholder involvement includes communication, provision of information, consultation and participation throughout the decision making process. For legal and practical reasons, final decisions on how to manage contaminated land have to be the sole responsibility of the site owner or operator, but it is essential that they take stakeholders' views into account and demonstrate the impact of those views on the final decision.

More information on the objectives and mechanisms for stakeholder involvement is contained in the SAFEGROUNDS guidance document:

Community stakeholder involvement

Download from:
<www.safegrounds.com/guidance.htm>

Compliance with Principle 2 does not mean that all stakeholders have to be involved in all decision making steps for every contaminated land issue on every site. The involvement ought to be proportionate to the significance of the contaminated land problem (technical and societal) and will vary according to the stage in the land management process. Here it should be remembered that opinions may differ on what is and what is not considered significant. Nevertheless stakeholders have emphasised the need for all parties to be clear on the proposed stakeholder involvement plans. Agreement is generally sought at part of a scoping process.

These issues are covered in more depth in Chapter 4 and in Collier (2005a) *Community stakeholder involvement*. SAFEGROUNDS does not advocate particular involvement methods and the choice of method will depend on the circumstances. There is already a wide range of guidance available in the public domain (see other SAFEGROUNDS guidance Section 6.8 and the box in Section 4.3).

2.3

Principle 3: Identifying the preferred land management option

See Section 2.1.3 of the main SAFEGROUNDS guidance.

Site owners/operators should identify their preferred management option (or options) for contaminated land by carrying out a comprehensive, systematic and consultative assessment of all possible options. The assessment should be based on a range of factors that are of concern to stakeholders, including health, safety and environmental effects and various technical, social and financial factors.

SAFEGROUNDS guidance and the regulatory frameworks require that site owners and operators select the appropriate management approach for contaminated land by systematically assessing all the options as an input to the final decision.

This Principle applies to individual cases and specific situations but it is particularly important to take a structured, participative approach when developing an overall strategy for managing all the contaminated land on a site. The overall strategy for the site provides the framework for individual studies. The options for different areas of the site can be considered together and alternative strategies for the whole site can be compared. It is not usually appropriate to look for solutions for individual areas one at a time.

Further information on option selection is contained in the SAFEGROUNDS guidance document:

Guide to the comparison of contaminated land management options.

Download from:
<www.safegrounds.com/guidance.htm>

SAFEGROUNDS guidance does not recommend any particular approach to option identification and assessment. Instead, the main SAFEGROUNDS guidance describes the overall decision making process. A supporting SAFEGROUNDS guidance document includes guidelines that the proposed methodology should follow and gives examples of different approaches. In summary, the guidelines are:

- comparison of contaminated land management options should be undertaken in a structured, systematic and transparent manner with the involvement of stakeholders
- stakeholder involvement is an integral and defining part of the options comparison process. The extent of stakeholder involvement depends on the technical and societal significance of the contaminated land issue
- the level of detail in which the options are compared should be commensurate with the magnitude of the contaminated land issue, whether it is strategic or specific, and its potential impact on people or the environment
- the options comparison process will require information and data, which should be at an appropriate level of detail for the study. Uncertainties should be identified and taken account of in the options comparison
- the output of the options comparison should be a clear record of the information considered, the assessment of options, the views expressed, and the conclusions reached. Unless issues of national security dictate, it should be available to anyone interested.

2.4

Principle 4: Immediate action

See Section 2.1.4 of the main SAFEGROUNDS guidance.

Site owners/operators should assess both potential and known areas of land contamination and where appropriate implement a prioritised programme of investigation and any appropriate monitoring. On confirmation of areas of land contamination being present, control measures should be instigated until an appropriate management option has been identified and implemented.

The type of action taken depends on the scale, nature and complexity of the contamination. Different things may have to be done in different areas. The need for

immediate action depends on the potential risk, the need for regulatory compliance and the implications of delaying.

For instance, sites with stable historic contamination may well be in a period of monitoring and interim control pending agreement of the eventual end state of the site and the selection of a long-term management strategy. At the other extreme, immediate clean-up of any new spills is likely to be needed to minimise the risk of contamination spreading. Stakeholder involvement on such matters may be unrealistic, but after the event stakeholder groups should be informed of the actions taken.

Where there are different areas of contamination on site it makes sense to prioritise them taking account of overall hazard reduction.

2.5

Principle 5: Record-keeping

See Section 2.1.5 of the main SAFEGROUNDS guidance.

Site owners/operators should make comprehensive records of the nature and extent of contamination, the process of deciding on the management option for the contaminated land and the findings during the implementation and validation of the option. All records should be kept and updated as necessary.

SAFEGROUNDS Principle 5 requires site owners/operators to make comprehensive records about the management of contaminated land, to keep these records, and to update them as necessary. This is in line with statutory obligations and specific guidance provided by regulators. The aim is to record the condition of the land, particularly anything that might cause risk to future users of the site. The records need to cover all developments of the land quality management strategy, risk assessment work, selection of management options, carrying out and checking the effectiveness of the measures taken, and stakeholder involvement. SAFEGROUNDS stresses that owners/operators should make every effort to avoid relying on commercial confidentiality or national security as reasons for denying the public access to records.

Further information on record-keeping is contained in the SAFEGROUNDS guidance document:

Good practice guidance for land quality records management for nuclear-licensed and defence sites

Download from:
<www.safegrounds.com/guidance.htm>

SAFEGROUNDS supporting guidance introduces the concept of a land quality file to be created for each site with a suggested formalised structure for the records that need to be retained to cover each of these activities as appropriate.

Most stakeholders involved in the SAFEGROUNDS consultation want long-term records to be kept by public bodies rather than owners/operators and for them to be accessible to the public. The NDA is now setting up a National Nuclear Archive.

3

The SAFEGROUNDS process

The SAFEGROUNDS main guidance document explains how the land quality management process is integrated with the established procedures prepared by the Environment Agency in the Contaminated Land Report 11 (CLR 11) *Model procedures for the management of land contamination* (2004). These model procedures are endorsed by SEPA.

The process takes a tiered approach to increasing knowledge and the level of detail, and is divided into three elements:

- 1 Risk assessment.
- 2 Options appraisal to identify the preferred remediation strategy.
- 3 Implementation of the preferred remediation strategy.

The text below and figure overleaf summarise the main features.

3.1

Does SAFEGROUNDS process apply?

The process begins with a decision as to whether the SAFEGROUNDS guidance applies. It applies if it is known, or suspected, that legacy radioactive contamination is present on a nuclear-licensed or defence site, with or without non-radioactive contamination.

A preliminary land quality management strategy is developed at the earliest stages of the process, starting with the definition of the context and objectives of the risk assessment. Compatibility with any existing plans or decisions, such as the proposed end state need to be considered.

According to SAFEGROUNDS guidance owners/operators should tell stakeholders about any known or suspected radioactive contamination on the site, and involve them in the development and implementation of the land quality management strategy. The appropriate level of stakeholder involvement varies from one type of site to another and from one stage in land management to another. The stakeholder involvement strategy has to be proportionate and tailored to the situation, noting differing opinions on what is regarded as significant contamination.

3.2

Assess risks, implement and validate immediate controls

When contamination is known or suspected, the next step is to consider the risks to safety and the environment. The preliminary risk assessment could be undertaken to give an indication of the likely nature and extent of the problem. The important question at this stage is: Do the risks identified require active management? If so, any immediate actions should be identified and the activities prioritised.

On a large site it may take years to fully identify and characterise everything and so early emphasis will be on control while areas of suspected contamination are investigated and management strategies developed. At the other end of the scale, immediate clean-up of spill incidents is likely to be needed to minimise the risk of contamination spreading. Once clean-up or control is achieved then the effectiveness of the work should be validated by monitoring and sampling.

The extent of stakeholder involvement in decision making on immediate and short-term management methods varies from one type of site to another. Site owners/operators do not need to involve anyone in advance when they take immediate action on small patches of contamination. Where the extent of contamination is greater, and other factors such as the sensitivity of the site or the potential impact are higher, then appropriate stakeholder involvement will be necessary.

SAFEGROUNDS process

The SAFEGROUNDS Decision flow diagram is based on the process of managing land contamination outlined in CLR 11 with some modifications. As such, CLR 11 should be consulted when interpreting the decision flow diagram. The modifications incorporate the SAFEGROUNDS key principles and highlight extra factors to be considered on nuclear-licensed sites (civil and defence), particularly in relation to managing radiological hazards, which may also be pertinent to non-nuclear defence sites. The modifications to the original CLR 11 diagram are highlighted in dark red boxes and text on the decision flow diagram.

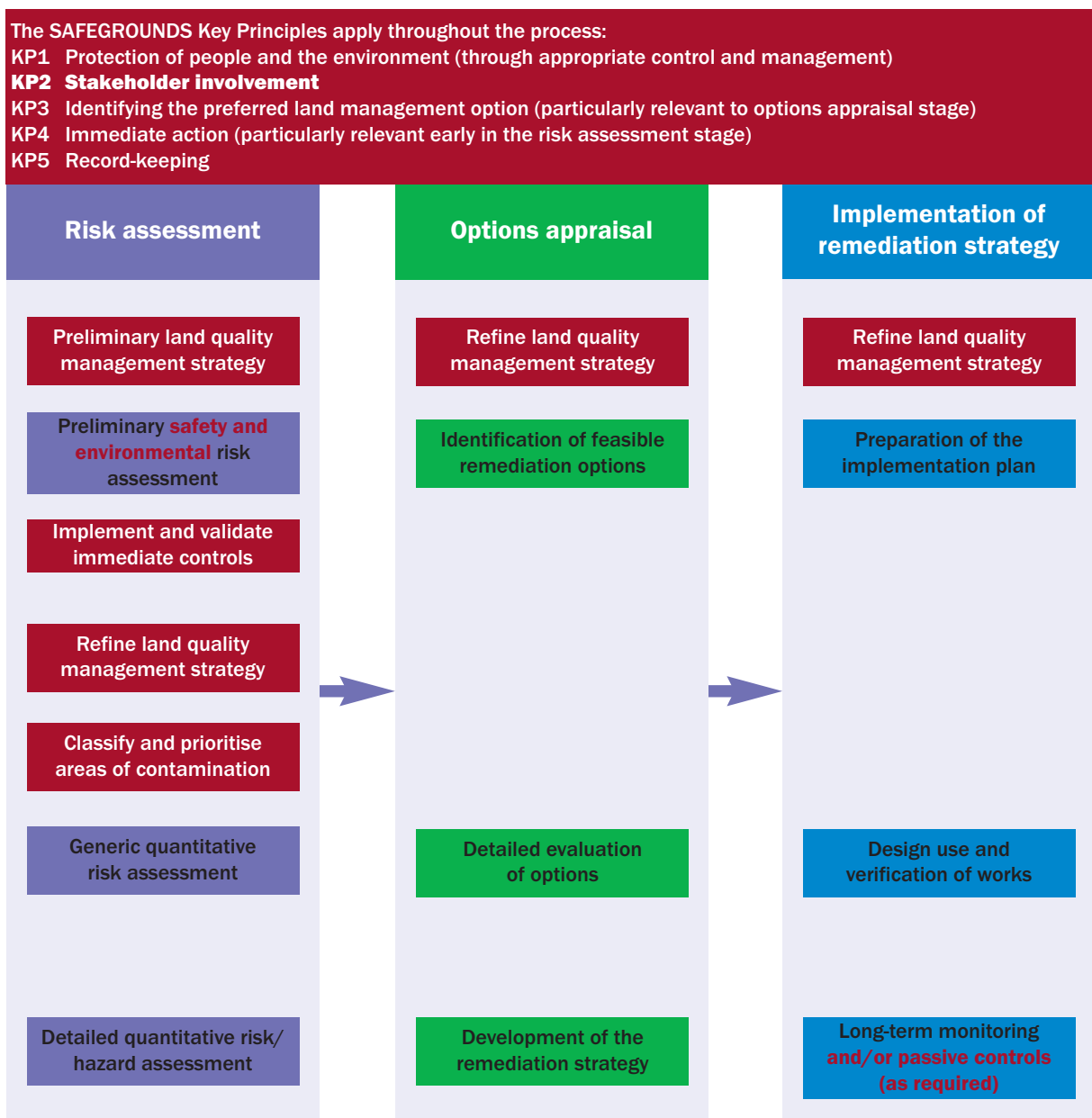


Figure 3.1 SAFEGROUNDS Decision flow diagram

3.3

Refine strategy and prioritise areas

The land quality management strategy is a live document that can be refined as more information becomes available about the nature of the contamination, its extent and possible management options.

Further information on characterisation is contained in the SAFEGROUNDS guidance document:

Good practice guidance for site characterisation

Download from:
<www.safegrounds.com/guidance.htm>

The guidance also applies to deciding the best course of action for specific areas on a site. The outcome could be that no further action is needed to reduce long-term risks, or that it would be best to monitor the area and reassess options at a later date.

If action is required, input from stakeholders may be needed to help decide what management approaches or technology should be employed. Detailed planning can then start. The main SAFEGROUNDS guidance notes that there is generally less stakeholder involvement needed in the smaller studies to decide what to do with particular areas than for overall site strategies, especially for low priority areas. However, stakeholders should be informed and given opportunities to review and discuss progress.

3.4

Generic and detailed quantitative risk assessment

Further information on risk assessment is contained in the SAFEGROUNDS guidance document:

Assessment of the health and environmental risks of management options for contaminated land.

Download from:
<www.safegrounds.com/guidance.htm>

Before detailed remediation plans can be developed, site owners/operators should have enough understanding of the contaminants present and their concentrations, where they are and whether they are likely to spread. If there is not already sufficient information available, investigations have to be carried out. This process, known as site characterisation, may involve research into past site operations and records, taking measurements and collecting samples for analysis.

The information gathered during site characterisation is then assessed at increasing levels of detail to define any risks to human health and the wider environment.

3.5

Appraisal of remedial options

The steps in establishing a preferred land quality management strategy on a site may involve integrating short, medium and long-term solutions, as follows:

- 1 Site owner/operator and stakeholders identify, assess and compare feasible strategies.
- 2 Site owner/operator and stakeholders undertake detailed evaluation of candidate strategies.
- 3 Site owner/operator identifies preferred strategy, with stakeholder input.
- 4 Regulators, decision makers and stakeholders assess proposed strategy.
- 5 Site owner/operator decides on strategy to be implemented – demonstrating effective impact of stakeholder input into the decision making process.

The strategy for contaminated land management will be developed, refined and implemented alongside the equivalent strategies for decommissioning and other activities.

3.6

Implementation of strategy

The overall objective of the SAFEGROUNDS process is to obtain the desired outcome for the site so that it can continue to be used safely in whatever way has been agreed, including the possibility that use may be restricted.

Plans and designs for implementing the preferred strategy will be prepared. Whether the works will be completed all at one time or whether they will be phased over a longer period will depend on other site activities and any time constraints on development.

The NDA has consulted on the end state for each of its nuclear-licensed sites. In many cases the initial objective is to achieve an interim state, followed by a long period of control and monitoring (also known as care and maintenance). Sites in this situation will not be de-licensed but their continued safe management will be ensured through the licence conditions regulated by the NII. Such a period will allow radioactive material to decay and reduce the risk to workers involved in the final stages of decommissioning. In some cases, it may never be a realistic objective to clear all the contamination and restrictions may have to be placed on future use. This implies the need for long-term institutional control for example through the proportionate regulation of disused nuclear-licensed sites by the NII.

The final step will always be to check that everything has worked as anticipated and that there are no unacceptable residual risks to people or the environment from the area in question. Surveys are required throughout implementation and when work has been completed. Continued monitoring may also be needed over many years (eg to check that contaminants are not moving into groundwater).

The main SAFEGROUNDS guidance gives recommendations of stakeholder involvement in these activities. It highlights that, especially where land is to be released for new uses, final checks will be mandatory and under strict regulatory oversight. Involvement of an independent organisation in this procedure will be valuable and stakeholders may wish to have a say in who that might be and what measurements they carry out.

4 Stakeholder involvement

4.1 SAFEGROUNDS approach to stakeholder involvement

SAFEGROUNDS brings together a wide range of stakeholders, from nuclear operators to anti-nuclear non-governmental organisations (NGOs). Given goodwill and the building of trust, different perspectives need not be a barrier to working together to make lasting decisions and solving problems. Dialogue does not mean having to agree on everything. This type of experience is now common throughout the civil and defence nuclear industry and there is willingness to involve local communities and other stakeholders, as well as willingness on the part of stakeholders to participate. Communities, regulators, and other stakeholders now expect it and there is a shared desire for better decisions and approaches that can be implemented with community support.

SAFEGROUNDS guidance emphasises the importance of:

- giving a wide range of stakeholders the opportunity to participate and allowing them to make the decision as to what they wish to be involved in, rather than restricting involvement arbitrarily
- beginning early, to build relationships and allow stakeholders to help shape the work programme and the stakeholder involvement plan
- allowing people to help formulate the questions as well as helping answer them. Restricting the scope to fit the project context and ruling out wider or related questions that trouble stakeholders will cause frustration
- a continued programme of stakeholder involvement covering overall planning and the decision making process is most effective. Separate involvement initiatives on individual projects are less likely to be satisfactory. This may mean setting up an overarching site stakeholder group.

4.2 Meaning of proportionality

SAFEGROUNDS recognises that stakeholder involvement has both financial and other resource costs, both for the sponsoring organisation and for stakeholders. This may be particularly so for members of the community who sometimes give up very substantial amounts of their own time and participate in decision making and consultation exercises. SAFEGROUNDS emphasises what it refers to as proportionality.

Compliance with Principle 2 does not mean that all stakeholders have to be involved in all decision making steps for every contaminated land issue on every site. Each situation is different and the history, local situation and wider context will affect the appropriate scale and scope of involvement and the techniques used. However, the involvement should still be proportionate to the extent of the contaminated land issue and the significance of this may be perceived differently by stakeholders. The nature of involvement will also vary according to the stage in the land management process.

For example a broad range of national stakeholders will be involved in strategic decision making for problems that are seen as significant by many groups within society. Lower profile decisions for smaller problems will have a more local focus.

SAFEGROUNDS states that the presumption in case of doubt should be to invite involvement – stakeholders have limited time available and can generally be trusted to respond appropriately.

If there is doubt about who to involve and how, then SAFEGROUNDS guidance recommends that the site owner/operator should consult stakeholders representing broad groups with a view to making the process as inclusive as possible. Communities remote from the site also need to be consulted if they may be affected by management of the contaminated land for a site, for example where communities live near, or on route to, a disposal facility that could be used for remediation wastes.

4.3 Designing the process

Some useful guidance from other sources is listed in Chapter 6.

SAFEGROUNDS guidance does not specify the use of any particular involvement methods or approaches. It makes the point, however, that in general the larger the scope and reach, the better defined and more formal the stages will need to be. In a smaller consultation the stages may be implicit or merged together. More information on the structure of stakeholder programmes is presented below. This illustrates how involvement might work in practice (note that not all activities are listed).

Proportionate stakeholder involvement

In all cases:

- anticipate, support and comply with regulatory requirements for notification, provision of information and consultation
- check for factors that might indicate extra measures are appropriate.

For a routine operational local contamination or clean-up issue with no effect on the community and unlikely to cause concern:

- in many cases, it will be sufficient for the owner/operator to notify the local community liaison group at the next routine meeting.

For a contamination or clean-up issue with the potential to generate significant local interest and debate:

Owner/operator to:

- invite a diverse range of local stakeholders (including local authorities) to provide input on issues to be taken into account and potential options
- keep local community and local stakeholders informed
- consider external input into option selection, eg options assessment panel
- consider event or other means of communicating with the public
- invite local stakeholders to provide input on implementation issues.

For a contamination or clean-up issue with strategic significance, likely to involve stakeholders at national level:

Owner/operator to:

- plan and make resources available for a significant stakeholder involvement programme, co-ordinated with other consultations as necessary
- develop stakeholder, communication and (if required) training programmes. Make background and project specific information available (typically through website and links)
- initiate front end stakeholder programme to explore issues, perspectives, strategic implications and options with local and national level stakeholders. Pass on to third parties as appropriate
- integrate external stakeholder input explicitly into option selection
- initiate stakeholder programme to review option selection and implementation issues.

Stakeholder to:

- organise, join or affiliate to an organisation to strengthen information exchange and representation
- as an individual, be vigilant in seeking and responding to stakeholder involvement information
- accept and comply with invitations for prompt involvement
- negotiate for mutually acceptable involvement formats, venues, information and timings
- negotiate for any special needs requirements
- consider engagement of specialist support
- seek funding to support stakeholder involvement activities.

5 Involvement opportunities

This section provides advice to people who want to find out what is happening at national policy or local site level and get involved in consultations and stakeholder involvement initiatives. Contact details and website links for the organisations mentioned are given in Section 6.


5.1 Policy development

Policy on radioactive waste management and discharge policy generally originates with Defra and its equivalents in Scotland, Wales and Northern Ireland. Defra does not operate a generic stakeholder register or a newsletter, so interested individuals are likely to find out about developments through other stakeholders who do (eg NGOs), or through national and specialist media (eg ENDS Report). Several commercial organisations and NGOs provide routine summaries of media coverage of nuclear issues (sometimes free, sometimes paid for).

Consultation documents are usually available on the Defra website and on request as hard copies. Individuals and organisations can usually register their interest as stakeholders with the project team or the contractor running the programme. They will then typically receive updates and may be invited to events and regional meetings.


5.2 Statutory sources of site-specific information and consultation

The Nuclear Decommissioning Authority (NDA) is the other major source of consultation on policy and strategy matters. Interested individuals and organisations can register for email alerts and news feeds on its website, as well as regular updates from the NDA Convenor for Stakeholder Engagement. It operates a National Stakeholder Group and runs regular consultations on strategy and other matters. Consultation documents are usually available on the NDA website and hard copy on request. Separate stakeholder groups operate at each of its sites (see below).



www.unece.org/env/welcome.html

The UN Espoo 1991 and Aarhus 1998 conventions initiate the development of practice in access to environmental information, multi-stakeholder involvement in decision making, environmental justice, and trans-boundary consultation respectively.



www.hse.gov.uk/nuclear/llc/links.htm

The Health and Safety Executive's Local Liaison Committees (LLC)/Site Stakeholder Group (SSG) reports are issued as part of its commitment to making information about inspection and regulatory activities relating to licensed nuclear sites available to the public, this may include issues relating to contaminated land and associated activities. Each major nuclear-licensed site has a liaison committee or stakeholder group, run by the licensee that can include local authorities, trade unions, particular interested local groups and members of the public. The LLC/SSG reports are distributed to members of the committees on a quarterly basis and are available on the HSE website. Links are also provided to the LLC websites where more information can be obtained. See Section 5.4 for more information on LLCs/SSGs.

The HSE is also responsible for the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended 2006) (EIADR).

Before a decommissioning project is granted consent an Environmental Statement will need to be submitted for approval to the regulator. The Environmental Statement will consider, among other things, the effects on soil including contaminated land issues. The HSE will consult on the Environmental Statement describing the environmental effects of the project.

5.3 Civil nuclear sites

There is a wide range of consultations linked to site-specific issues relevant to contaminated land matters. The following normally offer interested individuals and organisations the option of commenting on proposals or participating in the decision making process.

- options assessments carried out by the site licence companies (SLCs)
- regulatory consultations on discharge authorisations
- planning applications, eg change of use.

All of these advertise consultations and events in the local media but also it would be wise to register with the local SLC communications team as an interested stakeholder – the addresses will be on the website. Most maintain a register and invite those on it to become involved as opportunities arise.

All such initiatives usually include consultation documents, supplemented by other mechanisms for getting stakeholder input such as open meetings, drop-in days, focus groups, workshops and opinion polls.

Most local NGOs and pressure groups operate mailing lists, though they may not all include information on forthcoming consultations in their newsletters and email bulletins.

5.4 Site stakeholder groups

All nuclear-licensed sites have standing site stakeholder groups (SSGs), although they may be called something different. They meet up to four times a year and provide both a channel for communication between the site and the community and a mechanism for community oversight of operations. Members usually represent a local stakeholder organisation. Their websites normally list members and set out the terms of reference.

Most SSG websites also give details of meeting dates and venues and allow people to download papers and meeting reports. Attending these meetings is a good way of finding out what is happening on site. Agendas include reports from representatives of the SLCs and regulators and there will usually be an opportunity to meet them and discuss any issues of concern.

The NDA has a portal page for SSGs covering its sites. British Energy has web pages for each of its sites that have links to its site stakeholder groups and local community liaison committees.

Where there is concern that these groups may not adequately represent local stakeholders concerned about radioactive contaminated land in their area, SAFEGROUNDS recommends broader and more engaging stakeholder involvement.

5.5

Defence sites

With the exception of MoD nuclear sites, the level of community liaison may vary and the first point of contact should be the head of establishment or alternatively Defence Estates. The naval bases at Clyde and Devonport have local liaison committees, and the Vulcan Naval Reactor Test Establishment shares a joint SSG with the NDA Dounreay site. All these are open to the public. The Atomic Weapons Establishment (AWE) has sites at Aldermaston and Burghfield. It has been managed since 1993 on behalf of MoD by AWE Management Ltd. AWE has a local liaison committee that is not open to the public.

5.6

NGOs

Non-governmental organisations are another route by which people who share their perspective can become involved and find out more about the issues. Some organisations such as Friends of the Earth and Greenpeace campaign on nuclear issues as part of a wider campaign portfolio, while others (eg Low Level Radiation Campaign <www.llrc.org/>) have a narrower focus. There are local campaign groups generally opposed to nuclear power and nuclear weapons associated with many of the main civil and MoD nuclear-related sites.

6

Contacts and information

A list of the main nationwide organisations involved in stakeholder activities related to nuclear-licensed sites and MoD sites is provided, but the reader is encouraged to research the internet, libraries, local authority information and contact the national organisations to identify local interest groups.

6.1

Government

Defra

The Department for Environment, Food and Rural Affairs is responsible for environmental protection generally (including contaminated land) and is the sponsoring department for the Environment Agency. The Radioactive Substances Division at Defra is responsible for policy on radioactive waste management and radioactively contaminated land issues.

Radioactive Substances Division
Area 4C Ergon House
17 Smith Square
London
SW1P 3JR
<www.defra.gov.uk/environment/radioactivity/index.htm>

BERR

The Department for Business, Enterprise & Regulatory Reform has a varied role in respect of nuclear issues, encompassing: industry ownership and supervision, regulatory activities to protect the public and international safety. BERR is the sponsoring department for the NDA and HSE.

Energy Group
Department for Business, Enterprise & Regulatory Reform
1 Victoria Street
London
SW1H 0ET
<www.berr.gov.uk/energy/sources/nuclear/index.html>

Scottish Government

The Scottish Government Radioactive Waste Team

Radioactive Waste Team
Scottish Government
Victoria Quay
Edinburgh
EH6 6QQ
<www.scotland.gov.uk/Topics/Environment/Waste/16293>

Welsh Assembly Government

Department for Environment, Sustainability and Housing

Welsh Assembly Government
Cathays Park
Cardiff
CF10 3NQ

NDA

The Nuclear Decommissioning Authority has strategic responsibility for the UK's civil nuclear legacy and for decommissioning civil public sector nuclear sites.

Nuclear Decommissioning Authority
Herdus House
Westlakes Science & Technology Park
Moor Row
Cumbria
CA24 3HU

The main NDA website is <www.nda.gov.uk>. There is a stakeholder portal page at <www.nda.gov.uk/stakeholders>, which gives access in turn to pages for the National and Stakeholder Group and to current and past consultations. Links to the Site Stakeholder groups for NDA sites can be found at: <www.sitestakeholdergroups.org.uk>.

HPA

The National Radiological Protection Board merged with the Health Protection Agency forming its new Radiation Protection Division (RPD). The RPD provides expert information and has a significant advisory role in the UK. It provides advice to the public and its website is a useful resource.

Health Protection Agency
Centre for Radiation, Chemical and Environmental Hazards
Radiation Protection Division
Chilton
Oxfordshire
OX11 0RQ
<www.hpa.org.uk/radiation/>

Ministry of Defence

Regional Defence Estates Offices should be contacted in the first instance and details can be found at: <www.defence-estates.MoD.uk>

Alternatively Defence Estates can be contacted via:

Defence Estates Head Office
Kingston Road
Sutton Coalfield
West Midlands
B75 7RL

General enquiries
Tel: 0121 311 2140

The naval dockyard web pages are at <www.royal-navy.MoD.uk/server/show/nav.3109> (Devonport) and <www.royal-navy.MoD.uk/server/show/nav.3157> (Clyde). No web page is available for the Vulcan Naval Reactor Test Establishment operated by Rolls Royce adjacent to the NDA's Dounreay main site.

The Atomic Weapons Establishment has sites at Aldermaston and Burghfield. It has been managed since 1993 on behalf of the MoD by AWE Management Ltd <www.awe.co.uk>

Head of Communications
AWE
Aldermaston
Reading
RG7 4PR

6.2 Regulators

Environment Agency

The Environment Agency (EA) has responsibility for the regulation of the Radioactive Substances Act 1993 which covers the disposal of radioactive waste, for example they will comment on the aspects of a planning application where they have a regulatory responsibility. This means their advice is limited to the requirements of the Radioactive Substances Act 1993 for the accumulation and disposal of radioactive waste resulting from remediation (clean-up) or development works on the land. They will not advise local authorities or developers on the characterisation, radiological assessment or remediation of land contaminated with radioactivity.

With respect to Part 2A of the Environmental Protection Act 1990 in England and Wales, only local authorities have the power to determine land, other than on nuclear-licensed sites, as radioactive contaminated land (the Environment Agency has no such powers). Once the Local Authority has determined that a site is radioactive contaminated land it becomes a 'Special Site' and the Environment Agency takes over as the regulator.

The EA do have specific responsibilities under Part 2A to help local authorities inspect potential radioactive contaminated land. These include:

- informing the relevant local authority of any relevant information on sites that may require inspection
- giving advice to local authorities on how to carry out desk-based investigations and select contractors for non-intrusive surveys
- making any necessary intrusive investigations on behalf of the local authority.

As enforcing authority for Special Sites for the remediation of radioactive contaminated land, in certain circumstances, where there is no other person liable for the remediation, the EA have a duty to remediate.

The EA will not advise land owners or members of the public on whether a particular site needs to be regulated as radioactive contaminated land under the extended Part 2A regime. Anyone concerned or seeking advice about whether a site should be regulated should contact their local authority.

To contact the EA:

National Customer Contact Centre
PO Box 544
Rotherham
S60 1BY
enquiries@environment-agency.gov.uk
<www.environment-agency.gov.uk>

SEPA

The Scottish Environment Protection Agency (SEPA) is responsible for regulating the disposal of radioactive waste from nuclear-licensed sites and from other premises such as non-nuclear industrial sites, offshore installations, hospitals, universities and research premises. Their main objective is to minimise the impact of the use of radioactive material and the disposal of radioactive waste on the environment and on human health. To do this, they use the Radioactive Substances Act 1993 (RSA 93) and other legal instruments.

SEPA is involved with contaminated land in several ways, they:

- regulate industries so that future land contamination is prevented
- control the disposal of waste so that future land contamination is prevented
- provide comments in relation to their regulatory duties, in particular pollution of the water environment associated with land affected by contamination, when consulted
- issue licences as appropriate for activities associated with the remediation of contaminated land.

SEPA Corporate Office
Erskine Court
Castle Business Park
STIRLING
FK9 4TR
<www.sepa.org.uk/radioactivity/index.htm>

HSE/OCNS

The Health and Safety Executive regulates the nuclear industry through its Nuclear Directorate (ND). The Directorate's primary goal is to ensure that those it regulates have no major nuclear accidents. It regulates worker safety and waste management. The Nuclear Directorate includes the Nuclear Installations (NII) and the Office of Civil Nuclear Security (OCNS). It is responsible for the UK safety regulation of nuclear power stations, nuclear chemical plants, decommissioning, nuclear defence facilities, nuclear safety research and strategy, and for civil nuclear operational security and safeguard matters.

HSE Nuclear Directorate
4N.1 Redgrave Court
Merton Road
Bootle
L20 7HS
NDenquiries@hse.gsi.gov.uk
<www.hse.gov.uk/nuclear/index.htm>

Food Standards Agency

The Food Standards Agency oversees local authority enforcement activities for food law. It sets and monitors standards and audits local authorities' activities to ensure enforcement arrangements are proportionate, consistent and transparent. Powers to enable the Agency to monitor and audit local authorities are contained in the Food Standards Act 1999 this includes the regulation of radioactivity in food.

Food Standards Agency
Aviation House
125 Kingsway
London
WC2B 6NH
<www.food.gov.uk>

6.3 Local authorities

NuLeAF

The Nuclear Legacy Advisory Forum seeks to build capacity within local government to engage effectively with nuclear legacy management and works to represent the views of member local authorities to national bodies.

Nuclear Legacy Advisory Forum
c/o Suffolk County Council
Endeavour House
Russell Road
Ipswich
Suffolk
IP1 2BX
<www.nuleaf.org.uk>

Cumbria County Council

Cumbria County Council covers Sellafield and LLWR. It has a specialist nuclear issues team and maintains a nuclear issues web page at:

<www.cumbria.gov.uk/planning-environment/nuclear/nuclear_intro.asp>

Nuclear Issues Manager
Cumbria County Council
County Offices
Kendal
LA9 4RQ

6.4 Industry

British Energy

British Energy Group Plc operates the UK AGR and PWR nuclear power stations.

Systems House
Alba Campus
Livingston
EH54 7EG
<www.british-energy.com>

NDA site licence companies

The best starting point for the NDA site licence companies is the NDA site portal at: <www.nda.gov.uk/sites>. The new SLC names are as follows:

- Sellafeld Ltd comprises Sellafeld, including Calder Hall, Windscale and Capenhurst.
- Magnox North Ltd comprises Chapelcross, Hunterston A, Trawsfynydd, Wylfa and Oldbury
- Magnox South Ltd comprises Berkeley, Bradwell, Dungeness A, Hinkley Point A and Sizewell A
- Dounreay Site Restoration Ltd comprises the Dounreay site only
- Research Sites Restoration Ltd comprises the Harwell and Winfrith facilities
- LLW Repository Ltd comprises the low level waste repository near Drigg in Cumbria
- Springfields Fuels Ltd comprises the Springfields plant near Preston, Lancashire

NIA

The Nuclear Industry Association is the trade association and information body for the UK civil nuclear industry.

Nuclear Industry Association
Carlton House
22a St James's Square
London
SW1Y 4JH
<www.niauk.org>

6.5

Non-governmental organisations

Greenpeace

Greenpeace UK's nuclear issues team campaigns on bringing an end to nuclear power, nuclear reprocessing and nuclear waste dumping.

Greenpeace Ltd
Canonbury Villas
London
N1 2PN
<www.greenpeace.org.uk/nuclear>

Friends of the Earth

Friends of the Earth's climate change team campaigns on similar issues to Greenpeace in this arena

Friends of the Earth
26-28 Underwood Street
London
N1 7JQ
<www.foe.co.uk>

6.6

Campaign groups

Low Level Radiation Campaign

The LLRC campaigns on a wide range of issues associated with the risks associated with effects of low levels of radiation, including radioactive waste management, and radioactively contaminated land. It also presents an alternative view of radiological risk to that advised by HPA.

The LLRC is represented on the SAFEGROUNDS Steering Group.

LLRC
The Knoll
Montpellier Park
Llandrindod Wells
Powys LD1 5LW
<www.llrc.org>

No 2 Nuclear Power

Campaign website opposing new nuclear build, but with useful resources pages:
<www.no2nuclearpower.org.uk>

6.7

Other information sources

- ENDS Report: a monthly journal for environmental policy and business in the UK:
<www.endsreport.com/>
- The Virtual repository of Nuclear Information: a subscription website giving access to independent information and news on international radioactive waste management: <www.thevirtualrepository.info>
- Radwaste.org – the primary purpose of this US site is to provide links to reference sources for radioactive waste management professionals but the information is more generally useful: <www.radwaste.org>
- N-base a free access database of newspaper articles on the UK nuclear industry and related issues. Also publishes weekly e-mail briefings for subscribers:
<www.n-base.org.uk>
- Soil and Groundwater Technology Association (SAGTA) is a non-profit making association of member organisations drawn from UK companies representing many of the major industry sectors. Its members actively address technical challenges associated with the management of landholdings which are potentially contaminated <www.sagta.org.uk>
- Contaminated Land:Applications in Real Environments (CL:AIRE) is an independent not-for-profit organisation established in 1999 to stimulate the regeneration of contaminated land in the UK by raising awareness of, and confidence in, practical and sustainable remediation technologies
<www.claire.co.uk>
- NICOLE is a leading forum on contaminated land management in Europe, promoting co-operation between industry, academia and service providers on the development and application of sustainable technologies <www.nicole.org>
- news websites from the BBC, Guardian etc
- website providing information about the nature of nuclear consultation
<www.nuclearconsult.com>.

Contamination and radioactivity

- Radiation health and nuclear safety. An industry view from the Nuclear Industries Association: <www.niauk.org/images/stories/pdfs/radiation-health-safety.pdf>
- Health Protection Agency Radiation Protection Division web pages. Information for the public on a range of radiation-related topics: <www.hpa.org.uk/radiation/default.htm>
- European Committee on Radiation Risk web pages. It is analogous to the International Committee on Radiological Protection (ICRP) and challenges ICRP's views: <www.icrp.org/>. Investigates and reports on contamination and low level radiation issues: <www.euradcom.org/>

Decision making

- Guidance for the Environment Agencies' *Assessment of best practicable option assessment studies at nuclear sites*. EA & SEPA (2004). Download from: <www.environment-agency.gov.uk/static/documents/PMHO0204BKHK-e-e.pdf>

Stakeholder involvement

- Dialogue by Design has produced a useful *Handbook of public and stakeholder engagement*. Download from: <www.dialoguebydesign.net/consultation/resources_handbook.htm>
- BERR. The Government has a code of practice on consultation. Download from: <www.berr.gov.uk/files/file47158.pdf>

SAFEGROUNDS <www.safegrounds.com>

COLLIER, D (2005a) *Community stakeholder involvement*, W16, CIRIA, London

COLLIER, D (2009c) *Approach to managing contaminated land on nuclear-licensed and defence sites – an introduction*, W27, CIRIA, London

CRUICKSHANK, J and GEORGE, S (2007) *Good practice guidance for land quality records management for nuclear-licensed and defence sites*, W21, CIRIA, London

HILL, M D, PENFOLD, J, HARRIS, M, BROMHEAD, J, COLLIER, D, MALLET, H and G SMITH (2002) *Good practice guidance for the management of contaminated land on nuclear and defence sites*, W13, CIRIA, London

HILL, M D (2005a) *Briefing note on the Energy Bill*, W19, CIRIA, London

HILL, M D (2005b) *The regulatory framework for contaminated land on nuclear-licensed sites and defence sites*, version 4, W17, CIRIA, London

HILL, M D, PENFOLD, J, WALKER, R, EGAN, M, COLLIER, D, ESLAVA-GOMEZ, A, KRUSE, P, RANKINE, A and TOWLER, P (2009a) *Good practice guidance for the management of contaminated land on nuclear-licensed and defence sites*, version 2, W29, CIRIA, London

PENFOLD, J (2009) *Guide to the comparison of contaminated land management options*, W28, CIRIA, London

SMITH, G M (2005) *Review and commentary on site end-points and radioactively contaminated land management*, W20, CIRIA, London

SMITH, G (2007) *Assessments of health and environmental risks of management options for contaminated land*, W15, CIRIA, London

TOWLER, P A, RANKINE, A, KRUSE, P and ESLAVA-GOME, A (2009) *Good practice guidance for site characterisation*, W30, CIRIA, London

SD:SPUR (Site Decommissioning: Sustainable Practices in the Use of Resources)
<www.sdspur.com>

MILLER, W and TOOLEY, J (2005) *Good practice guidance on the application of sustainable practices to the management of decommissioning wastes from nuclear-licensed sites*, W009, CIRIA, London

HILL, M D (2007) *Good practice tools for use in the development of strategies, plans and procedures for the management of decommissioning wastes and redundant buildings, plant and equipment on nuclear sites*, Information paper, W22, CIRIA, London

HILL, M D (2007) *The UK regulatory framework for decommissioning and the management of decommissioning wastes*, Information paper, W23, CIRIA, London

Radioactive waste management

Radioactive waste management involves dealing safely with the wastes from processes involving radioactivity. This waste comes from several sources, and ranges from paper towels used in hospitals to nitric acid solution formed as a result of reprocessing nuclear fuel.

Most radioactive waste is now stored safely on major sites under license from the Health and Safety Executive's Nuclear Installations Inspectorate and is subject to strict regulatory control.

For an overview of radioactive wastes in the UK, the radioactive waste inventory can be consulted at www.nda.gov.uk. Reports are also available on this site on the development of the concepts for a geological disposal facility.

Recent developments in government policy include:

- 1 June 2008 *White Paper on managing radioactive waste safely*
- 2 January 2008 *Summary of responses: consultation on managing radioactive waste safely: a framework for implementing geological disposal*
- 3 March 2007 *Policy for the long-term management of solid low level radioactive waste in the United Kingdom*

Information can be found at:

<www.defra.gov.uk/environment/radioactivity/waste/index.htm>

CoRWM, the Committee on Radioactive Waste Management provides independent scrutiny and advice on the UK's management of its solid radioactive waste, including plans for interim storage and geological disposal of higher activity waste. Information about the work of CoRWM and about radioactive waste and its management, as well as its consultation process is available on: <www.corwm.org.uk>.

Glossary

Key:

Bold = terms with special meanings in the SAFEGROUNDS context

Underlined = terms with defined meanings in other contexts (eg regulatory contexts or units definitions).

Plain text = technical terms to assist non-technical audiences.

Activity	See <i>Radioactivity</i>
<u>As low as reasonably practicable (ALARP)</u>	<u>A standard for assessing necessary control measures taking into account the practicalities of the task in hand. Note: reasonably practicable has a defined legal meaning in the UK. ALARP incorporates this legal meaning as opposed to any other meaning that may be implied from technical publications such as those by the International Commission on Radiological Protection (ICRP).</u>
Background (radioactivity)	Radioactivity from naturally occurring radionuclides, and anthropogenic radionuclides from man-made sources (such as global fallout as it exists in the environment from the testing of nuclear weapons or from accidents like Chernobyl) that are not under the control of the owner/operator.
<u>Becquerel (Bq)</u>	<u>The International System of Units (SI) of activity equal to one nuclear transformation (disintegration) per second.</u>
Contaminant	A substance that is in, on or under the land and that has the potential to cause harm or to cause pollution of controlled waters.
Contamination	The presence of a substance that is in, on or under the land and that has the potential to cause harm or to cause pollution of controlled waters.
Contaminated land	Any land in, on or under which there are radioactive or non-radioactive contaminants at levels above the natural and artificial background levels that are typical of the area of the UK where the site is located.
Context	The existing situation where decisions on the management of the contaminated land need to be taken. The context will include information about the contamination and its status, time, regulatory factors and stakeholders and any issues of particular importance.
<u>Controlled waters</u>	<u>Defined in Part III (Section 104) of the Water Resources Act 1991, which includes all groundwater, inland water, estuaries and coastal water to three nautical miles from the shore.</u>
Criterion	A property or measure of an option's performance that is relevant to the comparison of options. Criteria should be capable of being objectively quantified for all options under consideration (even if only with a simple scoring or ranking scheme). Criteria should also be unique and independent of one another and be defined at a similar level of detail. Criteria are sometimes referred to as attributes.
<u>Decay</u>	<u>See <i>Radioactive decay</i></u>
Decision making	The process of deciding which option should be implemented. A major input into decision making is a formal comparison of options. However, other factors may play a role in determining which option is to be implemented.

Decommissioning	The set of actions taken at the end of a nuclear facility's operational life that take it permanently out of service. It includes actions to systematically and progressively reduce the level of hazard on a site and may include the physical dismantling of facilities. The ultimate aim of decommissioning of a nuclear-licensed site is to make the site safely available for other purposes. The endpoint for decommissioning may be delicensing or reuse of the site for nuclear purposes, or the keeping of the site under institutional control.
Defence site	In this guidance, defence sites include non-nuclear sites that have been or are being used for defence activities and nuclear sites that are operated for MoD by contractors and that are licensed and regulated by HSE under the Nuclear Installations Act (nuclear-licensed sites).
Desk-based investigation	Interpretation of historical, archival and current information to establish where previous activities were located, and where areas or zones containing distinct and different types of contamination may be expected to occur, and to understand the environmental setting of the site in terms of pathways and receptors.
<u>Delicensing</u>	<u>The process of releasing a nuclear-licensed site from regulation under the Nuclear Installations Act and of releasing the operator from their period of responsibility for any nuclear liability.</u>
<u>Detailed quantitative risk assessment</u>	<u>Risk assessment carried out using detailed site-specific information to estimate risk or to develop site-specific assessment criteria.</u>
<u>Discharge Environment</u>	<u>Any emission of a contaminant into the environment.</u> <u>The environment includes land, water (including groundwater), air, flora, fauna, buildings, animals, crops and sites of historical and cultural importance. In this guidance, people are regarded separately from the environment. The distinction is made for consistency with health and safety, and radiological protection, terminology.</u>
End state	The state beyond which no further regulatory controlled action by the current site owner/operator is required. Note this differs from the NDA definition: <i>“The end state of a site is the physical condition of the site at the point at which the NDA has finished its business”.</i> This definition does not necessarily require all radiological material to be removed from the site because it is possible for the site to remain under long-term institutional control even after the NDA has finished its work. It is possible that a site's end state may be mixed – it may consist of several areas remediated to standards appropriate for differing potential reuses.
External radiation	In relation to a person means radiation coming from outside the body.
Future use	The range of uses that contaminated land can be put to after the selected option has been implemented successfully. The range of future uses may be restricted to reduce the

	potential hazards associated with residual contamination. Alternatively, the site may be made available for any future use but lower levels of residual concentrations of contaminants are likely to be required.
Generic assessment criteria	Criteria derived using general assumptions about the characteristics and behaviour of sources, pathways and receptors. These assumptions will be protective in a range of defined conditions.
Generic quantitative assessment	Risk assessment carried out using generic assumptions to estimate risk or to develop generic assessment criteria.
Groundwater	All water that is below the surface of the ground in the saturation zone and is in direct contact with the ground or subsoil.
Half-life	The time required for half of the atoms of a particular radionuclide present to decay (disintegrate).
<u>Harm</u>	<u>Adverse effect on the health of living organisms, or other interference with ecological systems that they form a part of. For humans this includes property.</u>
Hazard	A property of situation that in particular circumstances could lead to harm or pollution.
High level of protection	The level of potential impacts on people and the environment that all stakeholders agree can be tolerated. SAFEGROUNDS does not recommend a particular level of protection, rather it is recommended that the level of protection should be reviewed in each case.
Ingestion	Contaminant entering the stomach and gastrointestinal tract through eating contaminated food, imbibing fluids or hand to mouth contact.
Inhalation	Breathing contaminant (eg particulate material, vapour, gas) in through the mouth or nose.
Injection	Contaminant entering the body tissue and blood stream directly through cuts and abrasions.
Interest	A person or organisation participating as a stakeholder to acquire information and knowledge about a topic, as well as contributing to involvement activities.
Internal radiation dose	Exposure received internally to the body via inhalation, absorption, ingestion or injection routes.
Involvement	The processes of communication, consultation and participation of stakeholders.
Key principle	A fundamental principle that should be adhered to during land management. Through consultation, SAFEGROUNDS has developed five key principles on: the protection of people and the environment, stakeholder involvement, the identification of the preferred land management option, taking immediate action and record-keeping.
Land quality	The condition of ground (soil, water and buried structures) due to natural or man-made factors that can affect people or the environment.

Land quality management strategy	A document (or document suite) establishing a framework of arrangements, processes and broad objectives for all aspects of management of contaminated land on a site (or part of a site).
<u>Licensee</u>	<u>The organisation that is the holder of the nuclear site licence on a nuclear-licensed site. The licensee is responsible for nuclear safety on the site and for discharging all the obligations and liabilities associated with the nuclear site licence.</u>
Management of contaminated land	Aspects of actions taken to detect, characterise, control, monitor or remove (wholly or partially) contamination in on or under land (including groundwater) and all the processes that contribute to the decisions for taking such actions.
Monitoring	A continuous or regular period check to determine the presence or absence of contamination, its nature and the performance of any remediation works, which includes measurements undertaken for compliance purposes, and those undertaken to assess remedial performance.
Naturally occurring radionuclides	Radionuclides and their associated progeny produced during the formation of the earth or by interactions of terrestrial matter with cosmic rays.
Non-radioactively contaminated land	Any land in, on or under (including groundwater) which there are non-radioactive contaminants above natural and artificial background levels that are typical of the area of the UK where the site is located.
Nuclear fission	Process when an atom splits into two or more pieces. Each one is an entirely separate nuclide.
<u>Nuclear-licensed site</u>	<u>Sites that are regulated by HSE under the provisions of the Nuclear Installations Act 1965 (as amended) with a nuclear-site licence. The Act applies to fixed sites for the purposes of constructing and operating nuclear reactors and other prescribed nuclear installations. The guidance applies to operating sites and those being decommissioned, whether or not they are to be delicensed.</u>
Objectives	This is what management of contaminated land intends to achieve. Objectives are set by considering factors such as government policy, corporate/organisational policy and the views of stakeholders. It is recommended that environment and health and safety objectives are established separately from those that are commercial or administrative.
Option	Any potential method of managing the contaminated land that is relevant to the objectives. Options can include, but may go further than, some or all of the actions defined as remediation in Part 2A of the Environmental Protection Act 1990. In evaluating options, consideration should always be given to doing nothing more to the contamination or to removing contamination to background levels.
Owner/operator	The organisation with responsibility for the site and any associated contaminated land. At nuclear-licensed sites the operator is the licensee. Owners/operators are responsible for taking final decisions to implement the proposed option for land management.

Pathway	A route or means by which a contaminant can reach, or be made to affect, a receptor.
People	Individuals that could be affected by contaminated land. People are distinguished from environment following health and safety and radiological protection convention. Separate consideration may be given to workers (who receive a direct financial benefit from the owner/operator) and the public (who do not). Consideration should also be given to people now and in the future.
Pollutant linkage	The relationship between a contaminant, a pathway and a receptor.
Possible options	All the options that would be effective for managing the contaminated land.
Preferred option	An option that, on the basis of the options comparison, represents the best balance of features to achieve the overall objectives for the management of the contaminated land.
Preferred strategy	The strategy that is identified by an owner/operator as preferred. It follows a comprehensive, systematic and consultative assessment of potential strategies derived by considering the options for the various areas on a site.
Preliminary risk conceptual assessment	First tier of risk assessment that develops the initial model of the site and establishes whether or not there are any potentially unacceptable risks.
Proposed option	The option that is formally submitted by an owner/operator to regulators and decision makers for approval to implement. This follows a comparison of options, identification of a preferred option, and consideration of this preferred option in regulatory and other acceptance procedures.
Proposed strategy	The strategy that is formally submitted by an owner/operator to regulators and decision makers for approval to implement. This follows the comparison of strategies, identification of a preferred strategy, and consideration of this preferred strategy in regulatory and other acceptance procedures.
Radiation	The emission of energy by particles or waves (alpha, beta, gamma and X-rays, and neutrons.
Radioactive decay	The spontaneous transformation of an unstable atom into one or more different nuclides accompanied by either the emission of energy and/or particles from the nucleus, nuclear capture or ejection of orbital electrons, or fission. Unstable atoms decay into a more stable state, eventually reaching a form that does not decay further nor has a very long half-life.
<u>Radioactive material</u>	<u>Often used to describe any material containing radionuclides. The statutory definition of radioactive material is given in the Radioactive Substances Act 1993.</u>
Radioactively contaminated land	<u>Any land in, on or under which there are radioactive contaminants at levels above the natural and artificial background levels that are typical of the area of the UK where the site is located.</u>

Note that in, on or under includes soils, rocks, groundwater and below ground structures but excludes authorised disposals of radioactive and non-radioactive wastes. These definitions are for the purposes of SAFEGROUNDS only. They have been chosen because they best reflect the views of stakeholders on the levels of contamination that SAFEGROUNDS guidance should be concerned with. The term “radioactively contaminated land” also has a precise legal definition taken from the EPA 1990 Part 2A.

Radioactivity	The mean number of nuclear transformations occurring in a given quantity of radioactive material per unit time. The International System of Units (SI) for radioactivity is the Becquerel (Bq).
Radionuclide	An unstable nuclide that undergoes radioactive decay.
Receptor	An entity (persons, living organisms, ecological systems, controlled waters, atmosphere, structures , utilities) that may be adversely affected by a contaminant.
Records	Information including details of site characterisation work, the process of deciding on the land management option/strategy, implementing the option/strategy and validating its implementation, as well as interaction with stakeholders throughout the process. There is a key principle about the keeping of records.
Remediation	Any measures that may be carried out to reduce the risks from legacy contamination of land areas through action applied to the contamination itself (the source) or to the exposure of pathways to humans or other receptors.
Remediation (Part 2A)	<p>Defined in Section 78A(7) as:</p> <ul style="list-style-type: none"> a) <u>The doing of anything for the purpose of assessing the condition of:</u> <ul style="list-style-type: none"> (i) <u>the contaminated land in question</u> (ii) <u>any controlled waters affected by that land</u> (iii) <u>any land adjoining or adjacent to that land</u> b) <u>The doing of any works, the carrying out of any operations or the taking of any steps in relation to any such land or waters for the purpose:</u> <ul style="list-style-type: none"> (i) <u>of preventing or minimising, or remedying or mitigating the effects of any significant harm, or any pollution of controlled waters, by reason of which the contaminated land is such land</u> (ii) <u>of restoring the land or waters to their former state</u> c) <u>The making of subsequent inspections from time to time for the purpose of keeping under review the condition of the land or waters.</u> <p><u>OR with respect to radioactive contamination defined in Section 78A(7)(as modified) as:</u></p> <ul style="list-style-type: none"> a) <u>The doing of anything for the purposes of assessing the condition of:</u> <ul style="list-style-type: none"> (i) <u>the contaminated land in question</u> (ii) <u>any land adjoining or adjacent to that land.</u>

	<p>b) <u>The doing of any works, the carrying out of any operation or the taking of any steps in relation to any such land for the purpose:</u></p> <p>(iii) <u>of preventing or minimising, or remedying or mitigating the effects of any harm by reason of which the contaminated land is such land</u></p> <p>(iv) <u>of restoring the land to their former state</u></p> <p>c) <u>The making of subsequent inspections from time to time for the purpose of keeping under review the condition of the land.</u></p>
Remediation strategy	A strategy to organise and manage the action taken to prevent, minimise, remedy or mitigate the effects of any unacceptable risks.
Risk	A combination of probability, or frequency of occurrence, of a defined hazard and the size of the consequences.
Risk assessment	The formal process of identifying, assessing and evaluating the health and environmental risks that may be associated with a hazard.
Risk management	The processes involved in identifying, assessing and determining risks, and/or the implementation of actions to mitigate the consequences or probabilities of occurrence.
Site	A contiguous area of land where contamination is known or suspected to be present. In most cases, a site will have a single owner/operator. Sites considered in this guidance are further classified as nuclear-licensed sites or defence sites.
Site characterisation	The process of gathering information about a site (or group of sites) and its setting(s) for the purposes of assessing and, where necessary, managing health and environmental risk. Guidance on site characterisation has been developed by SAFEGROUNDS.
Site investigation	On-site investigation that involves the collection and analysis of soil, surface water, groundwater and/or soil gas as a means of further informing the site conceptual model and the risk assessment. The investigation may be undertaken in a single number of successive stages.
Site-specific assessment criteria	Values for concentrations of contaminants that have been derived using detailed site-specific information on the characteristics and behaviour of contaminants, pathways and receptors. These correspond to relevant criteria in relation to harm or pollution for deciding whether there is an unacceptable risk.
Source	A hazardous substance or agent that is capable of causing harm, eg a contaminant).
Stakeholder	A person or organisation interested in the management of contaminated land. There are various groups of stakeholders: institutional stakeholders include the owner/operator, regulators, government departments and local authorities. External stakeholders are all those outside the owner/operator organisation. Those stakeholders involved in decisions on the management of contaminated land are participating stakeholders and may include local residents, CBOs and NGOs.

Validation

The process of demonstrating, by inspection, sampling, testing and recording, that the risk has been reduced to meet remediation criteria and objectives based on a quantitative assessment of remediation performance.

Acronyms and symbols

AGR	Advanced gas-cooled reactor
ALARP	As low as reasonably practicable
AWE	Atomic Weapons Establishment
BE	British Energy
BERR	Department of Business, Enterprise & Regulatory Reform (formerly the DTI)
BPEO	best practicable environmental option
Becquerel (Bq)	A unit of radioactivity (one nuclear transformation per second)
CBO	Community based organisation
CL:AIRE	Contaminated Land: Applications in Real Environments
DE	Defence Estates
Defra	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EIADR	Environmental Impact Assessment for Decommissioning Regulations
ENDS	Environmental Data Services Report, but known as ENDS Report
ES	Environmental Statement
HPA	Health Protection Agency
HSE	Health and Safety Executive
HSWA	Health and Safety at Work etc Act 1974
IAEA	International Atomic Energy Agency
LLC	Local liaison committees
LLRC	Low Level Radiation Campaign
LLW	Low-level radioactive waste
LLWR	Low level waste repository
LQF	Land quality file
LMGv2	Land management guidance (version 2)
OCNS	Office of Civil Nuclear Security
MoD	Ministry of Defence
MHSW	Management of Health and Safety of Work Regulations 1999
ND	Nuclear Directorate
NDA	Nuclear Decommissioning Authority
NFLA	Nuclear Free Local Authorities
NGO	Non-governmental organisation
NIA	Nuclear Installations Association
NII	Nuclear Installations Inspectorate
NuLeAF	Nuclear Legacy Advisory Forum
Part 2A	Environmental Protection Act 1990: Part IIA Contaminated Land (inserted by the Environment Act 1995)
PWR	Pressurised Water Reactor
RPD	Radiation Protection Division

RSA 93	Radioactive Substances Act 1993
SAFEGROUNDS	SAFety and Environmental Guidance for Remediation Of UK Nuclear and Defence Sites
SAGTA	Soil and Groundwater Technology Association
SAPs	Safety assessment principles
SD:SPUR	Site Decommissioning: Sustainable Practices in the Use of Resources
SEPA	Scottish Environment Protection Agency
SI	International System of Units
SLC	Site licensee company
SSG	Site Stakeholder Group
UK	United Kingdom
UN	United Nations