CIRIA

SAFEGROUNDS Approach to Managing Contaminated Land on Nuclear and Defence Sites - A Citizens Guide

CONSULTATION ON SECOND FULL DRAFT

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Please Note: Graphics are indicative only at this stage

Acknowledgements

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1.1 SAFEGROUNDS Network

"SAFEGROUNDS" stands for **SAF**ety and **E**nvironmental **G**uidance for the **R**emediation **o**f **U**K **N**uclear and **D**efence **S**ites

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 which also have radioactive contamination.

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 it. It is not binding and has no legal standing.

1.2 Guidance

Good Practice Guidance for the Management of Contaminated Land on Nuclear and Defence Sites

A full list of supporting documents is given in Section 6.

All can be downloaded from 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. All these supporting documents have been reviewed and updated to be consistent with the 2008 version of the main SAFEGROUNDS guidance. They are all available for download from the SAFEGROUNDS website.

1.3 The Citizens Guide

This Citizens Guide has been published in response to requests from community groups for a non-technical overview of the principles (Section 2) and processes (Section 3) which underpins 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, Section 4) and provides links to supporting documents. It also suggests how interested members of the community can get involved in decision making and site monitoring activities (Section 5).

SAFEGROUNDS covers radioactive and mixed contamination, but this Citizens Guide 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 Section 6.

1.4 Contaminated Land

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

Best Practice Guidance for Site Characterisation (download from www.safegrounds.com/guidance.htm)

SAFEGROUNDS guidance uses the terms contaminated and radioactively contaminated land to mean the following[1].

Contaminated land – any land on or under which radioactive or non-radioactive contaminants are, or are suspected to be, present at concentration levels above the natural and artificial background concentration levels that are typical of the area of the UK in which the site is located.

Radioactively contaminated land – any land in, on or under which radioactive contaminants are, or are suspected to be, present at concentration levels above natural and artificial background levels that are typical of the area of the UK in which the site is located.

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. Contaminated land is not classed as radioactive waste, though it may have to be classed as waste if it is dug up.

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

For an alternative view, see the Low Level Radiation Campaign website (contact details in Section 6)

The hazards to people and the environment from radioactive contamination depend on the nature of the radioactive contaminant, its concentration, and the extent to which it is spread. High levels of radioactive contamination may pose major risks to people and the environment. Low levels of radioactive contamination can still be detected by radiation instrumentation and are generally considered to pose less risk. However, there are differences of opinion as to whether any level of contamination can be considered 'safe'.

Fig 1 Principle types of exposure pathway associated with working on contaminated land

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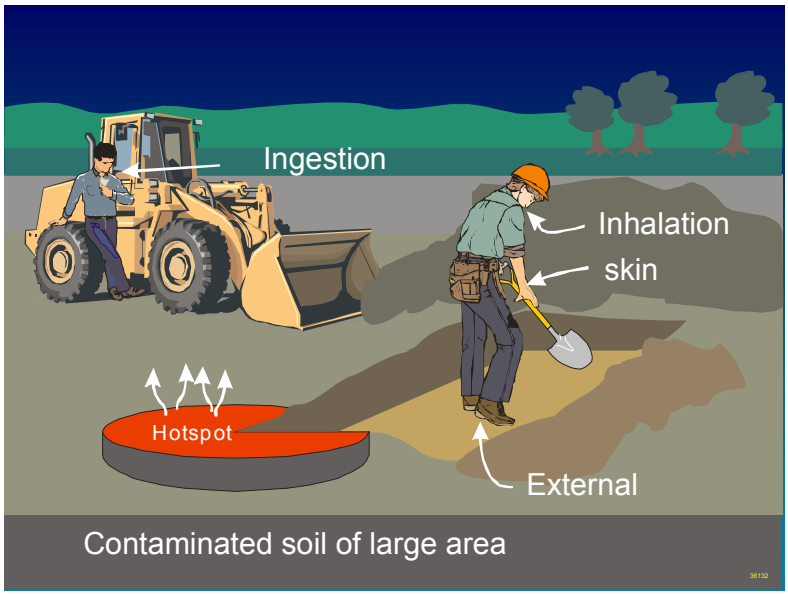


Figure courtesy of Health Protection Agency taken from HPA, 2003.

[1] Note that these are not legal definitions.

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.

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

http://www.hse.gov.uk /nuclear/licensees/pub register.pdf)

The main civil sites are owned by either British Energy or the Nuclear Decommissioning Agency (NDA). Other licensees are listed on the 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 has responsibility 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, Winfrith and Culham, 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 License Companies (SLCs) under contract to the NDA.

Contact details for all the organisations mentioned here are given in Section 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 sites at Aldermaston and Burghfield.

1.6 Non-nuclear defence sites

Radioactive contamination may also be present or suspected present at other MOD sites that are not nuclear licensed sites. The most common source of radioactive contamination on defence sites is from the former production, maintenance and disposal of instruments with luminous dials for vehicles, aircraft and ships. The peak period for luminising was from the 1930s to the 1970s.

Mixed radioactive and non-radioactive contaminants are often present on MOD sites. Hydrocarbons have for instance been used widely as fuel, lubricants and solvents and there may well have been spills and leakage over the years. MOD nowadays has stringent accounting procedures but explosive ordnance and ammunition may still be present on land used for training purposes and research facilities. Other contaminants commonly found on MOD land include asbestos, metals and general waste from workshops, storage and operational facilities. On certain sites more unusual contamination could be encountered, including chemical weapon residues.

The MOD has a programme of work to clean-up its non-nuclear sites and sell those that it no longer needs. The MOD Defence Estates organisation is responsible for the MOD's land and buildings and for managing this process.

1.7 Contaminated land regulation

See main SAFEGROUNDS guidance Section 3.1

As one would expect 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 chemically 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 a separate SAFEGROUNDS guidance document:

The UK Regulatory Framework for Contaminated Land on Nuclear-Licensed Sites and Defence Sites (download from www.safegrounds.com/gui

- If land contaminated with radioactivity is going to be developed on but there is no immediate danger, it is the responsibility of the developer to control the risks to occupants and users of the proposed development – controlled under planning regulations.
- Where the current use of land contaminated with radioactivity gives rise to prolonged exposure to humans above certain defined levels, the local authority can determine it as radioactive contaminated land. The 'appropriate person' is then required to clean it up – controlled under the Environmental Protection Act 1990 Part 2A.
- Land contaminated with radioactivity on civil or MOD nuclear licensed sites is regulated by the Health and Safety Executive (HSE) and (on certain sites) by internal MOD regulators.
- Cleaning up radioactively contaminated land is likely to result in the accumulation and disposal of radioactive waste. This must be authorised by the Environment Agency or its equivalents in the devolved administrations and Northern Ireland before the work starts – controlled on nuclear licensed sites under site license conditions and safety assessment principles and on other sites under the Radioactive Substances Act 93 (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 a similar standard of control.

2 SAFEGROUNDS Principles

See main SAFEGROUNDS guidance Section 2

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

- 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.

See main SAFEGROUNDS guidance Section 3.1

2.1 Principle 1: Protection of people and the environment

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 as one would expect 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 tend to refer to this principle as ‘As Low as Reasonably Practicable’ (ALARP). The environmental equivalent is ‘As Low As Reasonably Achievable’ (ALARA).

SAFEGROUNDS guidance documents recommend doing this through a case-by-case approach with stakeholder involvement. This would include assessment of the impact of any waste arisings to avoid unacceptable transfer of risk from one area or group to another.

Account also needs to be taken of important scientific uncertainties. 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 best management practice.

See main SAFEGROUNDS guidance Section 3.2

2.2 Principle 2: Stakeholder involvement

Site owners/operators should involve stakeholders in the planning and informing the decision-making processes for the management of contaminated land.

Stakeholders are all the people with an interest 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 to ensure that there is 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 get useful input into the process and thus make better 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 that they have carefully considered their input.

More information on the objectives and mechanisms for stakeholder involvement is contained in a separate 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. Stakeholders have emphasised the need for all parties to be clear on the proposed stakeholder involvement plans. Agreement is generally sought at part of 'scoping'.

These issues are covered in more depth in Section 4 below and in a separate SAFEGROUNDS guidance document. SAFEGROUNDS does not advocate particular involvement methods and the choice of method will depend on the circumstances. There is already a good range of guidance available in the public domain.

See main SAFEGROUNDS guidance Section 3.3

2.3 Principle 3: Identifying the preferred land management option

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 impacts and various technical, social and financial factors.

SAFEGROUNDS guidance and 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.

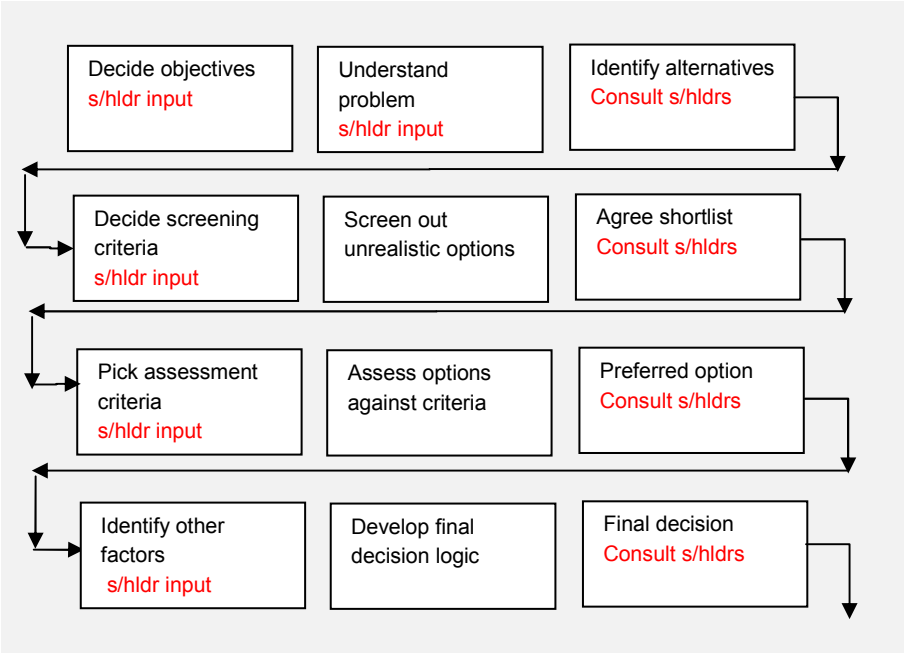
Further information on option selection is contained in a separate SAFEGROUNDS guidance document:

Guide to the Comparison of 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 describes the principles that the proposed methodology must satisfy and gives examples of different approaches. In summary, they are:

- Comparison of land management options should be undertaken in a structured, systematic and transparent manner with the involvement of stakeholders.
- The extent of stakeholder involvement depends on the technical and societal significance of the contaminated land problem.
- The level of detail in which the options are compared must be commensurate with the magnitude of the contaminated land issue, whether it is strategic or specific, and its potential impact on people.
- 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 must 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 all relevant stakeholders.

Fig 2 Typical Option Selection Process



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See main SAFEGROUNDS guidance Section 3.4

2.4 Principle 4: Immediate action

Site owners / operators should assess the potential threat from all known or suspected areas of contamination and implement a prioritised programme of monitoring and investigation. On confirmation of the threat, control measures should be instigated until an acceptable management option has been identified, implemented and validated.

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

For instance, sites with widespread, 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.

Where there are different areas of contamination on site it makes sense to prioritise them taking account of overall hazard reduction, but SAFEGROUNDS emphasises that low risk should not be used as an argument for delaying action to control and monitor contamination.

See main SAFEGROUNDS guidance Section 3.5

2.5 Principle 5: Record-keeping

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. The aim is to document the condition of the land, particularly anything that might give rise to risk to future users of the site. The records need to cover all site characterisation work, the 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 a separate SAFEGROUNDS guidance document:

Good Practice Guidance for Land Quality Records Management of Land Contamination (download from www.safegrounds.com/gui

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 currently setting up a National Nuclear Archive.

3 The SAFEGROUNDS Process

See main SAFEGROUNDS guidance Section 4

The SAFEGROUNDS main guidance document explains how the management strategy for contaminated land should be developed and proposes a generic flowchart applicable to all types of site. An appendix in the main SAFEGROUNDS guidance provides more detail and includes all the various feedback loops that are needed in detailed application.

The text below and figure overleaf summarise the main features.

3.1 Stage 1: Does SAFEGROUNDS apply?

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

SAFEGROUNDS guidance is that owners/operators should tell stakeholders about any known or suspected radioactive contamination on the site, certainly no later than Stage 3 (when they are consulted about the way forward) and earlier if appropriate.

3.2 Stage 2: Assess, monitor and implement immediate controls

When contamination is known or suspected, the next step is to consider whether any immediate actions are needed to protect people and the environment. On a large site it may take years to fully identify and characterise everything and therefore the early emphasis will be on control whilst 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.

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.

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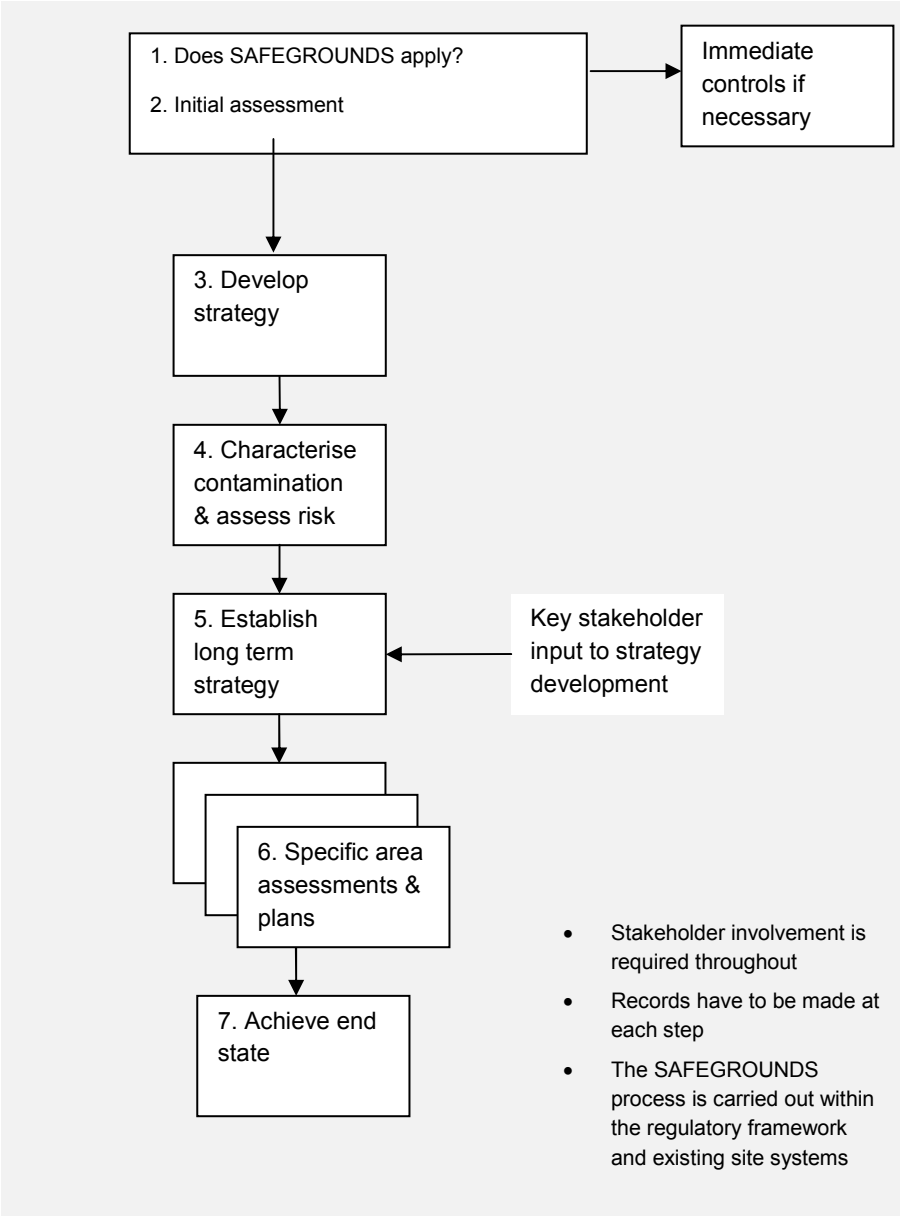
FIG 3: SAFEGOUNDS Process



3.3 Stage 3: Develop contaminated land strategy

There may well be an existing strategy and in some case the end state of the site might already have been decided. In this case, the contaminated land strategy should be consistent with existing site plans and strategies and the defined end state of the site.

A preliminary risk assessment could be undertaken initially 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?”

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 tailored to the situation.

3.4 Stage 4: Characterise contamination and assess risk

Further information on characterisation is contained in a separate SAFEGROUNDS guidance document:

Best Practice Guidance for Site Characterisation (download from www.safegrounds.com/guidance.htm)

Before detailed remediation plans can be developed, site owners/operators must 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 using mathematical models for the site contamination hydrogeology.

The main SAFEGROUNDS guidance suggests that stakeholders might be asked for their views on the priorities in terms of different contaminants, different areas of the site and the approaches to be used. Members of the community may also be able to offer an insight into past operations and/or possible causes of contamination which can be helpful.

3.5 Stages 5: Establish long term management for entire site

The steps in establishing a long-term management strategy for all the contaminated land on a site, which might mean integrating short, medium and long term solutions, are:

1. Site owner/operator and stakeholders assess and compare candidate strategies
2. Site owner/operator identifies preferred strategy, with stakeholder input
3. Regulators and decision-makers assess proposed strategy
4. Site owner/operator decides on strategy to be implemented

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

Stakeholders will be involved to some extent in all these steps; specific advice is given alongside the SAFEGROUNDS technical guidance. For steps 1 and 2 above, see the Option Comparison Guidance (Principle 3 above), for steps 3 and 4 see the main SAFEGROUNDS guidance text on Stage 5

3.6 Stage 6: Specific areas assessments and plans

The guidance for Stage 5 above also applies to deciding the best course of action for specific areas on a site. The outcome could be that action is taken, 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 well 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 in the smaller studies needed to decide what to do with particular areas than for overall site strategies, especially for low priority areas. However, stakeholders need to be informed and given opportunities to review and discuss progress.

3.7 Stage 7: Achievement of end-state

The overall objective of the SAFEGROUNDS process is to achieve the desired ‘end state’ for the site such that it can be reused safely in whatever way has been agreed.

The NDA is consulting on the end state for each of its sites. In many cases the initial objective is to achieve an ‘interim end state‘, followed by a long period of control and monitoring. This will allow radioactive material to decay and thus 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 long term ‘institutional control’.

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. On-going monitoring may also be needed over many years (for example, to check that contaminants are not moving into groundwater).

The main SAFEGROUNDS guidance makes recommendations as to the nature of stakeholder involvement in these activities. It makes the point that, especially where land is to be released for new uses, final checks by an independent organisation are valuable and that 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, ranging from nuclear operators to anti nuclear non-Governmental Organisations (NGOs), and clearly demonstrates that, given goodwill and trust, different perspectives need not be a barrier to working together to make decisions and solve 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 a greater willingness to involve local communities and other stakeholders as well as a greater willingness on the part of stakeholders to participate. Communities, regulators, and other stakeholders nowadays expect it, but the real driving force is the 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 frame 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.
- An ongoing programme of stakeholder involvement that covers the overall planning and decision-making process as shown in Fig X below. Separate involvement initiatives on individual projects are less likely to be effective. This may mean setting up an overarching site stakeholder group.

Fig 4: Typical involvement framework

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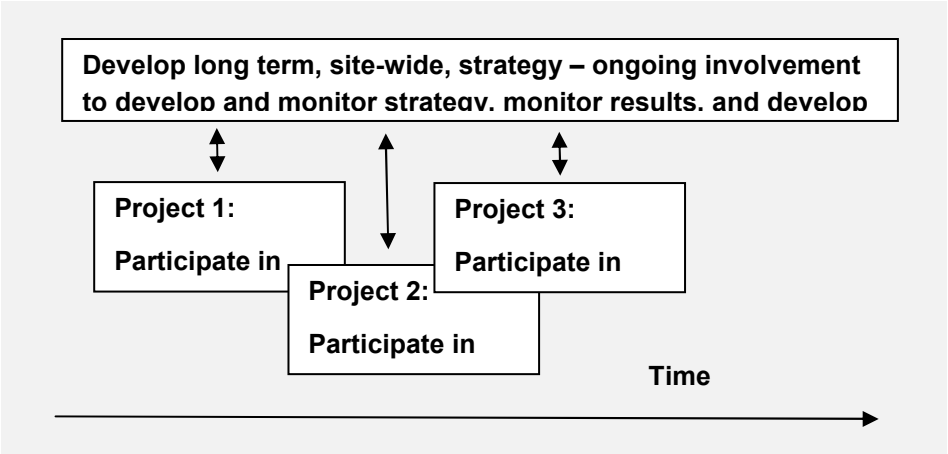

4.2 Meaning of ‘proportionality‘

SAFEGROUNDS recognises that stakeholder involvement has costs, both for the sponsoring organisation and for stakeholders – particularly for members of the community who sometimes give up very substantial amounts of their own time to sit on site stakeholder groups 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. Every 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 significance of the contaminated land problem in technical terms or more generally to the community and will vary according to the stage in the land management process.

For instance, 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, SAFEGROUNDS guidance recommends that the site owner/operator should consult key stakeholders about what ought to be done. 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 Section 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 be. In a smaller consultation the stages may be implicit or merged together. Supporting reports provide more information on the structure of stakeholder programmes. The table below illustrates how this might work in practice (note that not all activities are listed).

This is a placeholder for eventual figure.

Fig 5 Proportionate involvement

In all cases:

- Check for factors that might indicate additional measures are appropriate.
- Anticipate, support and comply with regulatory requirements for notification, provision of information & consultation.

A 'routine' operational local contamination or clean-up issue with no impact 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.

A contamination or clean-up issue with the potential to generate significant local interest and debate.

- Raise with local liaison group as soon as practicable and seek their advice on the appropriate level & scope of stakeholder input.
- Owner/operator invites key 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. BPEO panel.
- Consider event or other means of providing public with information.
- Invite local stakeholders to provide input on implementation issues.

A contamination or clean-up issue with strategic significance, likely to involve stakeholders at national level.

- Raise with local liaison group as soon as practicable and seek advice on the appropriate level & scope of stakeholder input.
- Plan and make resources available for a significant stakeholder programme, co-ordinated with other consultations as necessary.
- Develop stakeholder, communication and (if required) training programmes. Make backgrounds and project specific information available (typically through web site & links).
- Initiate 'front end' stakeholder programme to explore issues, perspectives, strategic implications & options with local and national level stakeholders. Pass on to 3rd parties as appropriate.
- Integrate external stakeholder input explicitly into option selection.
- Initiate stakeholder programme to review option selection and implementation issues.

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 equivalent 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 (e.g. NGOs), or through national and specialist media (e.g. ENDS Report). A number of 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 'road show' events and regional meetings.

The Health and Safety Executive's Local Liaison Committees (LLC) / Site Stakeholder Group (SSG) reports are issued as part of the 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 licensed nuclear site has a liaison committee or stakeholder group, run by the licensee which includes local authorities, trade unions, interested local groups and members of the public.

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

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 web sites where more information can be obtained.

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 (ES) will need to be submitted for approval to the regulator. The Environmental Statement would need to consider, amongst other things, the impacts to soil, which includes contaminated land issues. The HSE would consult on the environmental statement describing the environmental impacts of the project.

The Nuclear Decommissioning Agency (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. 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 on request as hard copies. Separate stakeholder groups operate at each of its sites (see below).

http://www.unece.org/ env/welcome.html

The UN 'Arhuus' and 'Espoo' conventions are drivers for the development of practice in access to environmental information and trans-boundary consultation respectively.

5.2 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 e.g. 'change of use'.

All of these advertise consultations and events in the local media but it would be wise also 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.

5.3 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 in turn have links to its site stakeholder groups and local community liaison committees.

5.4 MOD Sites

The MOD sites relevant to submarine reactor operations are the naval bases at Clyde and Devonport, which have local liaison committees. Vulcan Naval Reactor Test Establishment shares a joint SSG with the NDA Dounreay site. All these are open to the public. AWE has a Local Liaison Committee which is not currently open to the public.

Several MOD sites in the Defence Estates portfolio also have radioactive or mixed contamination. For other MOD sites community liaison arrangements may vary and the first point of contact should be the Head of Establishment or Defence Estates

5.5 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 such as Friends of the Earth and Greenpeace campaign on nuclear issues as part of a wider campaign portfolio; others (e.g. Low Level Radiation Campaign) have a narrower focus. There are local campaign groups generally also generally opposed to nuclear power and nuclear weapons associated with many of the main civil and MOD nuclear-related sites.

6 Contacts and Information

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 3 JR
www.defra.gov.uk/environment/radioactivity/index.htm

BERR

The Department for Business, Enterprise & Regulatory Reform's role in respect of nuclear issues a varied one, 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 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. 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
Oxon, OX11 0RQ
www.hpa.org.uk/radiation/

Ministry of Defence

Defence Estates manages the MOD's built estate and land.

DE Environmental Support Team
Building 21
Westdown Camp
Tilshead
Salisbury, SP3 4RS
www.defence-estates.mod.uk

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 has responsibility for the regulation of the Radioactive Substances Act 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 in England and Wales, only local authorities have the power to determine land as radioactive contaminated land (the Environment Agency has no such powers). Once the local Authority has determined that a site has 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 if we identify any relevant information on sites that may require inspection;
- giving advice for local authorities on how to carry out desk-based investigations and select contractors for non-intrusive surveys; and
- 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.

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 a number of 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 Office of Civil Nuclear Security is also now part of the HSE.

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, IP1 2BX
www.nuleaf.org.uk

NFLA

The Nuclear Free Local Authorities aim is to identify the impact of national nuclear policy on local communities; increase local accountability over national nuclear policy; and, work to minimise nuclear hazards and increase public safety.

NFLA Secretariat
Town Hall
Manchester, M60 2LA
www.nuclearpolicy.info

Cumbria County Council

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

The best starting point for the NDA Site Licence Companies is currently the NDA site portal at www.nda.gov.uk/sites. The new SLC names are as follows.

- Sellafield Ltd comprises Sellafield, including Calder Hall; Windscale & Capenhurst.
- Magnox North Ltd comprises Chapelcross; Hunterston A; Trawsfynydd; Wylfa & Oldbury
- Magnox South Ltd comprises Berkeley; Bradwell; Dungeness A; Hinkley Point A & Sizewell A
- Dounreay Site Restoration Ltd comprises the Dounreay site only
- Research Sites Restoration Ltd comprises the Harwell & 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 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.

The LLRC is represented on the SAFEGROUNDS Steering Group.

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

Local site campaign groups

There are too many to list in this Guide but the resources page of the 'no 2 nuclear power' campaign site (below) provides links to most.

No 2 Nuclear Power – campaign website opposing new nuclear build, but with useful resources pages. www.no2nuclearpower.org.uk

6.7 Other Information Sources

SAFEGROUNDS Members are invite to suggest additional sources

To be completed through consultation. Will probably include:

- ENDS Report - monthly journal for environmental policy and business in the UK. www.endsreport.com/
- The Virtual repository of Nuclear Information – 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 – 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,

6.8 Useful Guides and Documents

SAFEGROUNDS Members are invite to suggest additional guides and documents

To be completed through consultation. Will probably include:

Contamination and Radioactivity

- Radiation Health & Nuclear Safety. An industry view from the Nuclear Industries Association. http://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. http://www.hpa.org.uk/radiation/default.htm
- Low Level Radiation Campaign web pages. Comments on contamination and low level radiation issues, stating from the premise that the risks are significantly higher that generally assumed. http://www.llrc.org

Decision-Making

- Guidance for the Environment Agencies' Assessment of Best Practicable Option Assessment Studies at Nuclear Sites. Environment Agency & SEPA (2004).

Stakeholder Engagement

- Dialogue by Design have produced a useful 'Handbook of Public & Stakeholder Engagement'. Download from http://www.dialoguebydesign.net/consultation/resources_handbook.htm
- Environment Council

SAFEGROUNDS

Cruickshank J & George S (2007). SAFEGROUNDS Good Practice Guidance for Land Quality Records Management for Nuclear-licensed and Defence Sites. See www.safegrounds.com

Hill MD (2007) SD:SPUR regulatory framework paper (version 5)

Penfold JSS (2007). SAFEGROUNDS Guide to the Comparison of Land Management Options, in preparation

Smith, GM (2005). Assessment of the Health and Environmental Risks from Contaminated Land. A Paper from the SAFEGROUNDS Learning Network. See www.safegrounds.com.

Smith, GM (2005). Review and commentary on site-end-points and radioactively contaminated land management. See www.safegrounds.com.

Towler P, (2007) SAFEGROUNDS Site Characterisation Guidance. In preparation.

Towler P, Kruse P, M Hill, J Penfold, R Walke, M Egan, D Collier (2007) SAFEGROUNDS Good Practice Guidance for the Management of Contaminated Land on Nuclear and Defence Sites Version 2. In preparation

Glossary and Acronyms

Some terms are given more than one definition, suggestions for amendments to the definitions within the SAFEGROUNDS context is sought as part of the consultation.

activity	See *radioactivity*.
activity concentration	Terminology used to describe *radioactivity* levels relative to the mass or volume of the sample matrix (eg Bg kg^{-1} in soil, Bg L^{-1} in water).
Becquerel (Bq)	The International System (SI) unit of *activity* equal to one nuclear transformation (disintegration) per second.
characterisation	Establishing information on the presence and characteristics of contaminants, details of the environment in which they are present, and potential pathways to man and other environmental *receptors*. This can be achieved by various investigation methods. Guidance on site characterisation has been developed by SAFEGROUNDS.
contaminant	An undesirable concentration or quantity of a substance, e.g. *activity concentration* of a *radionuclide*, present in water, atmosphere or soil.
contamination	An undesirable concentration or quantity of a substance, or activity concentration of a radionuclide, present in water, atmosphere or soil.
contaminated land	Any land on or under which radioactive or non-radioactive contaminants are suspected to be present at concentration levels above the natural and artificial background concentration levels that are typical of the location of the site. This is not the same as the statutory definition in Part IIA of the Environmental Protection Act, 1990 which defines the presence of contamination by the possibility of significant harm or the pollution of controlled waters.
context	A definition of the existing situation in which the decisions on the management of the contaminated land need to be taken. The context will include information about the contamination and its status, timescales, regulatory factors and stakeholders and any issues of particular importance.
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".
decay chain	A series of *radionuclides*, each of which decays into the next *radionuclid*e in the series until a stable nuclide is reached.
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 to 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 re-use of the site for nuclear purposes, or the keeping of the site under institutional control.
defence site	In this guidance, non-nuclear sites that have been or are being used for defence activities and for which a change of use and/or ownership is planned. Nuclear sites that are operated for MoD by contractors and that are licensed and regulated by HSE under the Nuclear Installations Act are *nuclear-licensed sites*.
discharge	Any emission of a *contaminant* into the environment.
environment	The environment includes, but is not limited to, people's property (e.g. houses and land), existing and potential resources (e.g. groundwater, water quality, air

	quality) and natural ecosystems. In this guidance, *people* are regarded separately from the environment. The distinction is made for consistency with health and safety, and radiological protection, terminology.
future use	The range of uses to which the *contaminated land* will be able to be put 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, in which case lower levels of residual concentrations of contaminants are likely to be required.
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 one-half of the atoms of a particular *radionuclide* present to disintegrate (decay).
harm	Adverse effect on the health of living organisms, or other interference with ecological systems of which they form a part, and, in the case of humans, including property.
hazard	The potential for harm posed by a *contaminant* or circumstance, taking no account of the likelihood of exposure.
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.
ionising radiation	Any form of radiation that is capable of ionising matter. Typically this ionisation takes the form of displacing an electron from an atom.
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 manmade factors which could have an impact on people or the environment.
licensee	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.
management of contaminated land	The taking of any actions to detect, characterise, control, monitor or remove (wholly or partially) contamination in on or under land (including groundwater) and all the processes that lead up to decisions to take such actions.
monitoring	A continuous or periodic 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.
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 in which the site is located.
nuclear-licensed site	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.*
objectives	This is what management of contaminated land is intended 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, health and safety objectives are established separately from those of a commercial and administrative nature.

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 IIA 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 mechanism or route by which a *contaminant* can reach, or be made to affect, a *receptor.*
people	Those 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 at present and in the *future*.
pollutant linkage	The relationship of a *contaminant*, a *pathway* and a *receptor.*
preferred option	An option which, 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 their preferred one following a comprehensive, systematic and consultative assessment of potential strategies derived by considering the *options* for the various areas on a site.
proposed option	The *option* that is formally submitted by an *owner/operator* to regulators and decision-makers for approval to implement, following the 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, following the comparison of strategies, identification of a *preferred strategy,* and consideration of this preferred strategy in regulatory and other acceptance procedures.
radiation	Normally used in place of ionising radiation, radiation is the emission of energy by means of particles or waves.
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*.
radioactive material	Often used to describe any material containing *radionuclides.* The statutory definition of *radioactive material* is given in the Radioactive Substances Act 1993.
radioactively contaminated land	Any land in, on or under which there are radioactive contaminants above natural and artificial background levels that are typical of the area of the UK in which the site is located. The phrase "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 with which the SAFEGROUNDS guidance should be concerned. 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 (SI) unit of 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 of contaminated land	The taking of any actions to reduce the risks to humans or other organisms from contamination in, on or under land (including the groundwater).
remediation (SAFEGROUNDS)	Any measures that may be carried out to reduce the exposure from existing contamination of land areas through action applied to the contamination itself (the *source*) or to the exposure *pathways* to humans or other organisms.
remediation (Part IIA)	Defined in Section 78A(7) as: (a) The doing of anything for the purpose of assessing the condition of: (i) the contaminated land in question (ii) any controlled waters affected by that land (iii) any land adjoining or adjacent to that land b) 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: (i) 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 (ii) of restoring the land or waters to their former state c) The making of subsequent inspections from time to time for the purpose of keeping under review the condition of the land or waters. OR with respect to radioactive contamination defined in Section 78A(7)(as modified) as: a) The doing of anything for the purposes of assessing the condition of: (i) the contaminated land in question (ii) any land adjoining or adjacent to that land. b) 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: (iii) of preventing or minimising, or remedying or mitigating the effects of any harm by reason of which the contaminated land is such land (iv) of restoring the land to their former state c) The making of subsequent inspections from time to time for the purpose of keeping under review the condition of the land.
risk	An assessment of the potential for harm or damage posed by a *contaminant* or circumstance taking account of the likelihood, or probability, of occurrence.
risk assessment	The process of identifying, assessing and evaluating the health and environmental risks that may be associated with the 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.
screening (related to options)	The process of excluding options from detailed consideration. Screening is usually undertaken with reference to one or more “screening criteria” that represent basic expectations that must be met by any option. Screening criteria usually reflect the need for legality, technical feasibility, and a measure of proportionality between effort and benefits.
site	A contiguous area of land on which *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*.
source	A contaminant which is in, on or under the land and which has the potential to cause harm to an identified receptor or to cause pollution of controlled waters.
Source-receptor pathway	Is a statutory tool for establishing a pollutant linkage between a source of contamination and a potential receptor.

stakeholder	A person or organisation that has an interest in the management of the *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.
strategy	A broad plan for the management of all the *contaminated land* on a *site*, probably comprising of several *options*.

Acronyms and Symbols

ALARA	As Low As Reasonably Achievable
ALARP	As Low as Reasonably Practicable
AWE	Atomic Weapons Establishment
BERR	Department of Business, Enterprise & Regulatory Reform (formerly the Department of Trade and Industry
BPEO	best practicable environmental option
Bq	Becquerel – a unit of radioactivity (one nuclear transformation per second)
CBO	community based organisation
DE	MoD Defence Estates Organisation
Defra	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EIADR	Environmental Impact Assessment for Decommissioning) Regulations
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
LLW	low-level radioactive waste
LLWR	low level waste repository
LQF	Land Quality File
OCNS	Office of Civil Nuclear Security
MOD	Ministry of Defence
MHSW	Management of Health and Safety of Work Regulations 1999
NDA	Nuclear Decommissioning Authority
NFLA	Nuclear Free Local Authorities
NGO	non-governmental organisation
NIA	Nuclear Installations Association
NuLeAF	Nuclear Legacy Advisory Forum
Part 2A	Environmental Protection Act, 1990: Part IIA Contaminated Land (inserted by the Environment Act, 1995)
RSA 93	Radioactive Substances Act, 1993
SAFEGROUNDS	SAFety and Environmental Guidance for Remediation Of Uk Nuclear and Defence Sites
SEPA	Scottish Environment Protection Agency

SLC	Site Licensee Company
SSG	Site Stakeholder Group
UN	United Nations