Remediation on Nuclear Sites – the decision making process

SAFESPUR members'
Report E9403

Report of a workshop organised by Safespur held at David Langdon LLP, Colmore Plaza, Colmore Circus Queensway on the 07th October 2009

Speakers	Dr Trevor Jones	NUVIA
	Mr Mike Pearl	UKAEA
	Mr Lori Fellingham	NUVIA
	Mr Rob Sweeney	CL:AIRE
	Prof Phil Morgan	SIRIUS
	Mr David Bennett	ENVIRONMENT AGENCY
Chairman	Mr Peter Booth	NATIONAL NUCLEAR LABORATORY

The SAFESPUR meeting was held jointly with the Brownfield Risk Management Forum (BRMF) network and gave delegates the opportunity to hear the latest developments in support of the remediation of nuclear sites.

Peter Booth from National Nuclear Laboratory (NNL) chaired the meeting. The morning session included three speakers and the meeting was opened with a presentation that informed the delegates of the developments with regards to the remediation targets for contaminated land. This was followed by an insight into the Remediation options for the Zone 4 Dounreay case study. The final presentation of the morning session compared the practice with regards to remediation, of sites that have constrained and unconstrained decision making. The morning session was concluded with a question and discussion session.

The afternoon session featured three further speakers. It began with a talk outlining CL:AIRE initiatives and a demonstration project on a nuclear licensed site. The second presentation provided an insight into the use of Monitored Natural Attenuation as a long term management technique for contaminated sites. The final presentation pulled together the meeting by highlighting differences in the regulatory regime between non-radiological and radiological contamination. Before the meeting closed an open discussion was allowed to let delegates and speakers share their experience and potential concerns with the topics introduced during the meeting..

INTRODUCTION

The chair of the meeting opened the session by highlighting the topics that would be covered. These topics outline the regulatory regime, the decision making processes behind radioactive and non radioactive remediation and the remediation that has been and is currently undertaken on contaminated sites, the latter is highlighted using a number of case studies.

Over the last decade the management of contaminated land has changed alongside amendments in legislation and regulations. Advances in remediation technologies have advanced but appear to be better established for non radiological contamination than radiological. Furthermore, both these types of contamination are often considered in isolation.

In order to develop a land quality management strategy for non radiological contamination the Contaminated Land Report (CLR11), EA 2004, is often integrated into the decision making process. This is now seen by many to be applicable to the assessment of radiologically contaminated land. It is also important for both site owners and operators to consider all of the options for the long term management of contaminated land and how these may interact with other site activities over the life cycle of the site.

TREVOR JONES, NUVIA
Development of remediation targets for contaminated land

- Chartered Geologist and registered Specialist in Land Contamination with 20 years of experience in the characterisation of remediation in contaminated land.
- Experience has spanned the evolution of contaminated land policy and legislation over the years, including the introduction of Part 2A in 2000 and its subsequent extension to cover radiological contamination.

The focus of the presentation was to outline the CLR11 model procedures and to discuss the guidance available for carrying out assessment that fits inside the procedures. CLR11 consolidated the UK best practice procedures and is recognised by all UK environmental regulators. Its development was aimed at assisting consistent procedures throughout planning regimes, Part 2A and voluntary investigation and remediation. In essence CLR11 is an iterative three stage process in which stage one consists of a tiered risk assessment, stage two is an options appraisal where a decision is made on whether further investigation is required of if remediation should be undertaken and finally stage three involves the implementation of the remediation strategy itself.

The CLR11 procedures set out a framework for the risk assessment which can map out uncertainties, costs and benefits of the process. Tier one outlines the context and the objectives of the assessment before a conceptual site model is produced which is refined as more investigation data become available. This refinement of the site model is in fact the core of the overall process. During the tier one stage the site risks are identified in a preliminary risk assessment and an option appraisal is carried out to determine whether remediation or further investigation is required. Tier 2 is a generic quantitative risk assessment which implements the use of generic assessment criteria derived using conservative assumptions regarding characteristics and behaviours of sources, pathways and receptors. Tier 3 is a detailed qualitative risk assessment which requires the use of site specific information on the characteristics and behaviours of contaminants, pathways and receptors. After each tier the option appraisal process is iterated and the conceptual site model in updated. As the tier level is increased the more information and effort is required but it reduces the conservatism in the risk assessment and hence allows a more informed remediation strategy to be chosen.

Risk assessment guidance was reviewed. It was highlighted that CLR11 references a number of documents giving guidance for conducting different types of risk assessment but many have been revised and superseded since its publication in 2004. A number of guidance documents that are currently available are discussed below.

Revised Human Health Toxicological Assessment was published this year (2009). It applies to non-radiological contamination and was primarily developed for use under the Part 2A and planning regimes. It gives standardised methodologies for deriving health criteria values (HCV’s) which include Tolerable Daily Intake values (TDI’s) and Index Dose (ID) for non–threshold contaminants. The most relevant data for a particular pathway should be assessed during the assessment, and the document standardises the approach for level of confidence and level of conservatism that you apply to the standardised data. Furthermore, it sets out the framework for deriving Soil Guideline Values (SGV’s), which enables them to be derived for contaminants that currently have no SGV data published in the UK.

The Remedial Targets Methodology was published by the EA, SEPA & NIEHS in 2006 for hydrogeological risk assessment. The methodology is for deriving remedial objectives for contaminated soils and/or groundwater. The procedure involves creating a conceptual site model and identifies a compliance point which is the point at which the criteria must be met. It involves a tiered approach in which the tiers can be exited at any point. The higher the tier the more detail is required.

RCLEA is Defras recommended approach for assessment of radioactive contaminated land under Part 2A and it largely complements CLEA. It considers 47 radionuclides and a number of generic exposure scenarios. Its main limitations are that it does not include the exposure from Radon and cannot assess non-radioactive contaminants.

The HPA methodology for estimating doses to members of the public was developed in 2003 and looks at a smaller number of radionuclides than RCLEA but more exposures scenarios. Annual effective dose per unit activity concentration in soil for generic exposure scenarios are calculated and the results are tabulated for use in generic assessment to find the most critical pathway. Site specific assessments can be carried out by varying the parameters.

Further documents were identified including the EA Science Report, published in 2008 which provides a structural framework for ecological risk assessment and is implemented by using a three stage methodology, and the ERICA methodology (2007) which includes a software package that references large databases in order to produce an intergrated decision making framework. This is a tiered approach and calculates environment remediation concentration limits. The EA and English Heritage guidance on assessing risks posed by land contamination and remediation on archaeological resources assesses the risk to archaeology which is a requirement under Part 2A and the planning regime. Finally, the EA generic guidance on assessment and management of risks to building, building materials and services was mentioned. This is a relatively dated document that looked at the risks from aggressive substances, combustible materials, expansive slags and unstable fill.

The presentation was concluded with a brief overview of some Risk Assessment Models that are available and that are currently used. In addition to the above, the CLEA model, the EA Remedial Targets worksheet and ConSim were highlighted.

MIKE PEARL, UKAEA
Remediation Options for Zone 4, Dounreay

- 18 years of involvement in land quality and contaminated land issues with the last 13 being within the Nuclear industry
- Worked in the Safegrounds Project Steering Group since its inception over 10 years ago

An introduction to the case study site was given to open the presentation. The site was Zone 4 of the Dounreay Site and an options study was carried out – essentially using the SAFEGROUNDS approach. Zone 4 has multiple areas of contamination and two points at which radioactive active groundwater would discharge into the environment if protection measures were not in place. There are also a number of “Barriered Areas” which are controlled under the ionising radiation regulations.

The remediation strategy for Zone 4 was required to marry with the strategy for the overall decommissioning and restoration strategy for the Dounreay site. This essentially involved meeting the end state criteria that had previously been decided through extensive stakeholder consultation. Two end states and end points are recognised – (i) an interim end at year 2025 after which residual hazards left on the site can be managed using passive measures (land use controls and monitoring to achieve the required standard of safety; and (ii) a final end state, at ~2300, where the site can be released without any land use restrictions.

High levels goals were set and included satisfying current regulatory requirements for the site; consideration of the goals of the Dounreay Contaminated Land Strategy; ensuring that post 2025 any contamination left in the ground can be managed passively; ensuring that the management and remediation of contaminated land is compatible with the overall Dounreay life time plan; and ensuring that radioactive waste disposal is kept to a minimum, particularly in the near term.

To summarise the options assessment process, a conceptual site model was developed in order to identify contamination source areas. This was followed by the identification of the decommissioning and restoration constraints in each area. For each area generic remedial solutions were then identified and options were screened out if they conflicted with the constraints or were incompatible with the characteristics of the site. The remediation options were then assessed in an optioneering workshop with Dounreay stakeholders using a MADA approach. Three timeframes were considered for each option - Pre (short term), during (Medium term) and post decommissioning (Long term).

The types of options considered were of two types - provisional measures and durable solutions, where provisional measures were considered as "holding" measures which could be implemented until more sustainable and durable solutions could be implemented. It was envisaged that the overall remedial solution could involve a combination of provisional and durable solutions.

The presentation concluded with a summary of the optioneering approach and lessons learned. These lessons were as follows: (i) the conceptual site model is important in providing a focus to identifying where the remedial options need to be applied; (ii) options need to be considered generically (what the option does e.g. remove all contamination, remove the most hazardous contamination, immobilise the contamination, isolate the contamination, intercept groundwater from the contaminated land) as opposed to being specific descriptions of technologies; (iii) options need to be considered relative to a number of timeframes in order to integrate with the decommissioning and restoration strategy for the site; and (iv) remedial solutions need to take into account a wide range of Dounreay stakeholder concerns.

LORI FELLINGHAM, NUVIA
Remediation of sites with constrained and unconstrained decision making – a comparison in practice

- Chartered chemical nuclear engineer with over 30 years experience in the UK nuclear industry for a wide range of companies
- Experience includes various aspects of radioactive waste management, decommissioning and environmental restoration and is now responsible for environmental and waste management in NUVIA.

This presentation covered the clean up of two sites in terms of methodology and remediation. The sites were the former British nuclear weapons site in Australia and the Southern Storage Area at Harwell. Both of the sites required extensive consultation due to political issues and the Australian site was constrained further because nothing was allowed to be disposed off site.

The Southern Storage Area at Harwell site is approximately 7 hectares and its historical land use includes a Munitions storage compound for WWII bomber and training base, waste storage, treatment and disposal area for AERE Harwell, a Waste storage/disposal area for RRD and Industrial Chemistry Groups. Currently the site is surrounded by the Rutherford Appleton Laboratory and Chilton county primary school. The site contained a mixture of radioactive and chemical disposal facilities and contamination was present including left over ammunitions.

A classic safeground approach was used to analyse the site. The site was characterised for chemical and radiological contaminants through extensive surveys and this highlighted a groundwater problem. A risk assessment and review of potential management strategies was then carried out and the site could then be separated into areas based on contamination type. These areas were Beryllium Pits, Chemical Pits and Common Land areas. The options for treatment were primarily whether to leave the contamination in the pits on site and secure them or to infact remove it. Stakeholders were also a key issue here, and these included site users, Planning permission for the remediation of the site, so that the longer term goal of building houses, was required.

The planning constraints meant that the beryllium pits could not be left in place and this lead to approximately 250000m^3 of material being removed off site and the majority of it recycled. This was infact more than the actual BPEO required. The remediation work commenced and excavated all content of the pits, cleaned up the surrounding land and all the land was to reach the remediation targets. The remediation programme was extensive and required continuous monitoring as a number of unrecorded pits were uncovered. Remediation targets were set based on risk based clean up levels. Furthermore, the residual material on site needed to be lower than the authorisation levels. Due to the extent of the chemicals analysed the remediation targets were much more detailed than the CLEA model would have produced on its own. In addition to remediation all of the land on the site was processed for munitions. When it came to carrying out monitoring for nuclear contamination was much the simpler by use of Arial methods, where as in contrast the chemical monitoring required a sampling regime.

The site was restored at a cost of approximately £1.5million per hectare processed and part of it is now being used for recreational purposes. Part will become a housing development.

The Nuclear Weapons Test site in Australia went through a similar process. The site was large and approximately 15000Km^2 with many stakeholders and the reports and site data were placed in the public domain. The radioactive contamination included Plutonium, Uranium and Beryllium. An extensive risk assessment was carried but no assumptions were made about the risk assessment and every part of it was re-examined and the pathways were assessed. Assessment and decision making was by public consultation and number of groups were set up including a Technical Assessment group; Stakeholders group and the Maralinga Commission.

The differences between this site and the Harwell site were the constraints on the removal of material off site and that when the options stage had been carried out the Australian government set the price limit of £50 million for the remediation (which was a major constraint). This meant that the options had to be reassessed and costed out in order to find the best strategy to meet the remediation targets and the budget.

The remediation carried out involved a large amount of land being processed and a number of pits excavated. The remediation is now complete and deemed a success with all the reports still available in the public domain.

The presentation was concluded with Lori explaining that the constrained cost on the Australian site worked out well and possibly saved up to 4 times the amount of money that may otherwise have been spent. There may be scope for this type of practice to be implemented in the UK.

MORNING DISCUSSION

Q. The discussion commenced with Peter Booth (National Nuclear Laboratory) highlighting that a wide variety of tools and processes were currently used to access contamination risks and asked is there enough advice to non experts on which to use and is inconsistency a problem?

A. Trevor Jones (NUVIA) agreed that a wide variety of tools are available. The thought was that the early stage of risk assessment is relatively simple for inexperienced people to carry out, however, more experience is required at later stages, and stakeholder views have to be taken into consideration. He also mentioned that inconsistencies between radiological and non radiological assessments exist which emphasises the need for development of formal guidance.

Mike Pearl (UKAEA) commented that there is inconsistency in stakeholder knowledge, which could be achieved through a greater streamlined approach.

Lori Fellingham (NUVIA) stated that nuclear sites are government sites and so lie in the public domain. It is vital that best practice procedures are followed. All data can be requested and subject to scrutiny

Q. Anthony Johnson (British Energy) asked a question on whether remediation decisions are influenced by costs?

A. Peter Booth felt that when a team works on a project from an early stage they generally already have in their mind what the likely solution will be. In these cases this option often proves to be the final one too. Independent influences should be involved with the option decisions to provide fresh ideas and to avoid potential bias within the decision making process.

ROB SWEENEY, CL:AIRE
A CL:AIRE demonstration project on a nuclear licencesd site and other CL:AIRE initiatives.

- 8 years experience in contaminated land and remediation
- His roles involve the management of a number of remediation technology demonstration and research projects

CL:AIRE is a not for profit organisation set up by government and SAGTA with the objective of stimulating regeneration of contaminated land by raising awareness of, and confidence in, practical and sustainable remediation technologies. Projects that CL:AIRE become involved with have been accepted by the review process. This process is started by the CL:AIRE Management Team (CMT) who discuss the application and ensure it fits within their remit. Once accepted, the Techology and Research Group (TRG), which consists of twelve volunteer members from academic and industry backgrounds, will carry out a further evaluation which will result in the final acceptance or rejection.

The presentation discussed a successful application which was titled the TDP24 Case study. The site considered had been subject to varied land uses over the past 80 years and was contaminated with chlorinated solvents and other chemicals. Project objectives were to target contamination, reduce loading significantly and minimise emissions; undertake a pilot trial and undertake phased remediation as NDA funding becomes available. The pilot trial involved a site characterisation of the unsaturated zone contamination profile and to test the SVE technology. The testing of the technology was deemed a key advantage of this project in assessing the best remediation option. It was recommended that SVE should be carried out in the vicinity of the former chemical waste disposal pits and thermal enhancement of the SVC in areas of gross contamination notably beneath the footprint of the most severely contaminated disposal pits.

Based on the recommendations a methodology was produced to enable implementation, which included the re use of existing wells. The conclusions drawn from the case study were that the thermal heating speeded up the remediation and that no free product was recorded in nearby groundwater monitoring wells and these will be outlined in the final report which will be made available by the end of year 2009. The TRG favoured the methodology of this project because of the assessment of multiple treatment options during the pilot trial and also the link between pilot trial and full scale treatment. The TRG were responsible for reviewing the final report and adding comment.

In addition to this report, CL:AIRE have had a wide range of projects (including research projects) covering remediation technologies and site investigation & monitoring. The list is extensive and they continue to look for new projects. Their current initiatives include work on the sustainable remediation forum UK (SuRF) and the Cluster which will be a method for developing and remediating a group of sites that are relatively close to each other. Another valuable report that has been produced includes the Definition of Waste Code of Practice which provides a greater clarity over what is and is not waste.

The presentation concluded, by highlighting that training is provided on what CL:AIRE learn about remediation technologies and that membership is large and increasing as it provides access to their reports and good networking opportunities.

PHIL MORGAN, SIRIUS
Monitored natural attenuation (MNA) as a long-term management technique for contaminated sites

- 25 years experience in contaminated land and a member of the CL:AIRE technology and research group.
- Previously a member of the steering group for Environment Agency guidance on MNA

Natural attenuation (NA) is described as the effect of naturally occurring physical, chemical and biological processes, or any combination of these, to reduce the load, concentration, flux or toxicity of polluting substances in groundwater. For natural attenuation to be effective as a remedial action, the rate at which these processes occur must be sufficient to prevent polluting substances entering identified receptors. Risk management by NA is in line with CLR11 guidance. Monitoring is required to confirm that remedial objectives will be achieved within the required timescale. NA can in some cases be effective as a stand alone remediation technique or it can be used in conjunction with other techniques.

Evidence that monitored natural attenuation (MNA) is effectively reducing contamination on a site can be seen from field observations, such as a reduction in plume size and from field data presenting processes contributing to natural attenuation including the appearance of degradation products. The third line of evidence can come from laboratory data but this is rarely done as it is often unnecessary, relatively expensive and hard to interpret.

The MNA evaluation framework consists of four stages. Stage 1 is the primary assessment of whether MNA can be regarded as a viable option and Stage 2 provides evidence that NA is occurring. These stages are relatively easy to think about during the early stages of site assessment. Stage 3 assesses if MNA will meet the risk management objectives in the future and Stage 4 involves verification and monitoring to ensure the objectives continue to be met. The latter stages are more complex to assess.

Following the introduction to natural attenuation, a case study where MNA was implemented was presented. The site, a major supermarket distribution centre close to a river, had a historic diesel spill that had contaminated the soil and groundwater. The remediation needed to be carried out whilst the site remained fully operational. The chosen strategy involved the source being removed and a ground barrier being constructed to avoid oil migration to third party land. The plume was managed by MNA. In line with the lines of evidence approach mentioned previously, stage 1 was completed by the use of attenuation rate calculations per borehole, mass flux calculations and contour plots. The contour plots showed a reduction in plume size, which indicated that NA could cope with the flux of contaminants entering the groundwater after source remediation, had been undertaken. Stage 2 used field data to assess the ratio of readily available degradable hydrocarbon components to pristine and phytane and hydrochemical indicators of biodegradation.

MNA has a long track record, especially for organic materials. A number of inorganics can also be treated by this method such as radionuclides, nitrate and ammonia. For radionuclides there is no specific guidance in the UK. It is important in such cases that the decay chain be evaluated and the effectiveness of NA is likely to be determined by the most mobile and persistent components.

In terms of screening sites for MNA potential, hydrogeology offers some insight. A preliminary low level screening would suggest that a non-aquifer or simple intergranular flow system would be at one end of the spectrum and provide more likelihood of NA effectiveness and easier assessment than a major aquifer with flow through fractures such as Chalk. However, an air of caution should be taken with generic assumptions – there are cases of effective MNA in many aquifer systems.

The presentation concluded that MNA is valuable risk management option for groundwater plumes, that good guidance is available and that it can be used a wide range of environments.

DAVID BENNETT, ENVIRONMENT AGENCY
Non-radioactive and radioactive contamination

- Strategic Policy Manager, Radioactive Substances Regulations
- Member of the Safegrounds project steering group

As far as contaminated land is concerned, the Environment Agency's first priority is to prevent land contamination. However, where there is contamination to a piece of land then it tries to bring it back into use. Where possible this is done voluntarily by the polluter or land owner carrying out remediation, or when a developer cleans a site for redevelopment under a planning regime. In more serious cases, when voluntary action is unlikely or fails, remediation regulatory action within Part 2A is a last resort.

Part 2A was introduced in 2000/01 and extended in2006/07 to include radioactivity. Local authorities have a large part to play, as they are required to inspect their areas and determine contaminated land sites. The Environment Agency inspect potential 'special sites' and enforce their remediation.

The similarities between radioactive and non-radioactive contamination for Part2A include that it only applies to current land use; staged development of a conceptual model is fundamental as set out in CLR11; for land to be contaminated there needs to be a significant pollution linkage (pollutant, a pathway and receptor); and contaminated land is remediated by breaking the linkage.

In terms of differences between radiological and non-radiological contamination, the receptors for under Part 2A for non-radiological contaminants are human, water, non human species and property. For radiological contamination receptors are humans (also water in Scotland, defined in terms of impact on non-human species). Radioactive contaminated land uses the statutory 3m Sv/y dose threshold, the ICRP framework and the non-statutory RCLEA screening methodology. For chemically contaminated land the non-statutory CLEA and SGVs are used.

The CLEA project develops tools which provide a methodology to estimate chronic health risks to people from soil contamination. It also provides generic assessment levels of contamination in soils and a starting point from which risks can be assessed for instance under the Part2A of the Environmental Protection Act 1990. CLEA is an exposure model and can be used for any chemical for which the toxicological data exists. Soil Guideline Values (SGVs) have been developed for 10 substances with more being developed, but their development is a long process.

RCLEA uses the same scenario as CLEA and intends to be the first stage of the tier assessment for Part2A. It is hosted on the Environment Agency's website and applies to long-term radiation exposure situations that may require remedial action to reduce or avert individual doses.

In terms of dealing with contaminated land, the Environment Agency produced a report based on Part 2A which covers Wales. As yet there have been no sites concerning radioactive contaminated land. The report titled 'Dealing with contaminated land in England and Wales' covers the period from the introduction of legislation until March 2007.

With regards to radioactive contamination and Part 2A, the Environment Agency's original estimate is that almost a handful of sites would be classified as radioactively contaminated land. Several sites in England and Wales have been given early consideration, although none look likely to be potential contaminated sites under Part 2A. However, in Scotland at least one site is being seriously considered for possible determination under Part 2A. Radon and its daughter's exclusion in Part 2A have now been removed in Scotland only, but with England and Wales expected to follow suite in the near future.

Various proposals have been made for a European Soil Framework Directive that would seek to identify and remediate contaminated land and provide general requirements to prevent soil pollution could drive large scale changes in the future.

The presentation was concluded with the mention that NDA, HSE, EA and SEPA (i.e. the regulators) are working to set out shared expectations for land quality management. This will aim to provide a framework for dialogue against which progress in land quality management can be mapped.

LEARNING POINTS

1. The CLR11 model procedures provide a structured framework for applying risk management processes when dealing with land affected by contamination. The procedures are consistent with UK government policies and recognised by all UK environmental regulators.

2. There is a variety of guidance available which help produce risk assessments on contaminated land sites. These include the Environments Agencies Human Health Toxicological Assessment report for non-radiological contaminated land and RCLEA for radioactive contaminated land.

3. Conceptual site models are essential in the study of contaminated sites as they provide the focus for where remediation options are required, and the constraints specific to source areas.

4. Remediation of sites with a constrained decision making process, is not necessarily a negative thing as proven by the Remediation of the Nuclear Weapons Test site at Maralinga in Australia. The imposing of a tight budget after the option appraisal stage ensured that a cost effective remediation strategy was produced and it achieved its objectives.

5. Good communication with the stakeholders of sites is key in achieving overall project objectives.

6. CL:AIRE is a not for profit organisation set up by the government the Soil and Groundwater Technology Association (SAGTA) which aims to stimulate the regeneration of contaminated land in the UK by raising awareness of, and confidence in, practical and sustainable remediation technologies and effective methods for monitoring and investigating sites. This is done by the evaluation and approval of selected projects through their Technology and Research Group.

7. Monitored Natural Attenuation (MNA) is a viable risk management option for groundwater plumes subject to site circumstances.

8. Similarities in the assessment of radiological and non-radiological contaminated sites include the importance of conceptual model development which highlights a significant pollution linkage.

9. Use of RCLEA for the assessment of radiological contaminated sites involves the inclusion of fewer receptors to the contamination where as for non-radiological contaminated sites the CLEA and Soil Guideline Values (SGVs) are commonly used.

10. Scotland now includes Radon and any radionuclide present as a result of the radioactive decay of radon in Part 2A radioactive regulations.

AFTERNOON DISCUSSION

The afternoon discussion was led by the chairman and opened up two questions to the delegates. The first asked if there are differences in best practice for radiological, non-radiological and mixed contamination regulatory regimes and if this mattered? The second question opened to the delegates was whether there would be any benefit in having a consistent regulatory regime?

Comments included the following:-

- CLR11, SAFEGROUNDS and other UK guidance documents are available
- International legislation and guidance are driving UK legislation
- Non-radiological guidance in the UK has evolved and is fairly well established whilst radiological guidance has lagged behind
- There is a wide array of guidance documents for conducting different types of risk assessment, but in many cases they use differing assumptions and inconsistent terminology However, there is a lack of overarching summary guidance documentation and hence potentially a need to develop a scope which applies to both radiological and non radiological contamination
- Guidance is required on how to logically carry out an assessment on mixed contamination sites with radiological and non-radiological contamination. How do you prioritise the different risks?
- Policy and legislation applicable to the management of radioactive contamination are not aligned with that for non-radioactive contamination, which has evolved over the past two decades. Several important changes are on the horizon (e.g. Exemption Order review and incorporation of RSA93 into the Environmental Permitting regime in England & Wales), but further fundamental changes to radioactive legislation in the short term seems unlikely
- For mixed contaminated sites there is a mixture of guidance documents which can be confusing to land owners, but no guidance on the assessment of combined risks.

Further comments made are as follows:

- Ultimately, whether the risk is derived from radiological or non radiological contamination is unimportant. The fact that there is a risk is the important issue.
- There is an issue when assessing sites with a mixture of radiological and non radiological contamination as it's not yet known how to add up all the risks and come up with an overall remediation option.

CHAIRMANS SUMMARY

The meeting was concluding by a closing statement from the chairman, which made a recommendation that consistency with regards to the radiological and non radiological contaminated land assessment and remediation should be considered in the future in order to determine if it would improve the assessment of risk. Currently the issue seems to be that the radiological regimes have not advanced as quickly as the non radiological regimes and hence there is a inconsistency in the guidance that is available.

The questions that underlie the issues discussed are that, can the difficulties that are being seen on site be resolved? And if they can, then how easy is the process of resolving them. The resolution process if it related to changes in regulations and/or guidance would require lengthy consultation periods and so any changes will not be expected to happen in the near future.