Update on the Radioactive Waste Position in the UK - 11435

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ABSTRACT

This paper provides an update on recent activities in the UK with regard to the long-term management of higher activity radioactive wastes. It provides some background to explain the UK Government's Managing Radioactive Waste Safely (MRWS) programme, particularly the MRWS White Paper that sets out the framework for implementing geological disposal.

It details progress that the UK is making in dealing with its higher activity radioactive wastes and implementing geological disposal. It addresses the necessary regulatory measures that will have to achieved and how a site will be selected using a voluntarism and partnership approach.

It also provides an update on the latest position on how local communities have responded to the invitation to, make 'without commitment expressions of interest' to host a geological disposal facility.

The paper also provides an update on the progress of the implementation body (Nuclear Decommissioning Authority (NDA)) and its delivery organisation the NDA's Radioactive Waste Management Directorate (RWMD) – and what has happened in planning to implement UK Government's policy of geological disposal. It will explain the strategies and plans that have been put in place to enable the NDA to progress implementation, for example, the Public Stakeholder and Engagement and Communications Strategy, Sustainable Assessment and Environmental Appraisal Strategy, and the R&D Strategy. It will also describe the key publications that will provide information to a range of stakeholders including local communities. These include *Geological Disposal: Steps towards implementation.* A key deliverable will be the generic disposal system safety case documentation.

INTRODUCTION

This paper provides an update on what has recently happened in the UK with regard to the long-term management of higher activity radioactive wastes. It provides some background to explain the UK Government's Managing Radioactive Waste Safely (MRWS) programme, particularly the consultation undertaken to establish a framework for implementing geological disposal. This built on the work of the independent Committee on Radioactive Waste Management (CoRWM) which led to the publication of the MRWS White Paper in June 2008.

Background

The United Kingdom (UK) has been producing radioactive waste since the 1940s and since the Flowers report [1] in 1976 has recognised a need to establish arrangements for its long-term management.

In 2001 Government initiated the Managing Radioactive Waste Safely (MRWS) programme to find a practicable solution for the UK's higher activity wastes that:

- achieved long-term protection of people and the environment
- did this in an open and transparent way that inspired public confidence
- was based on sound science, and
- ensured the effective use of public monies.

The timetable for this programme is shown below in Table I.

Table I – Managing Radioactive Waste Safely (MRWS) Programme

Stage	Work	Timing
1	The MRWS consultation process, consideration of responses, planning for stage 2	2001-02
2	• Establishment of CoRWM • Research and public debate, led by CoRWM, involving option evaluation, using best public and stakeholder engagement and the best available scientific knowledge • Government decision on the option(s) to implement	2002-06
3	Consultation on the Government's framework for implementing its preferred option(s)	2007
4	Implementation of preferred option(s)	2008 onwards

Following the Stage 1 consultation, the independent Committee on Radioactive Waste Management (CoRWM) was established to review options and to recommend a long term solution to managing higher activity radioactive wastes in the UK.

After significant public and stakeholder engagement activities CoRWM made 15 recommendations in 2006 [2]. On 25 October 2006 the Government accepted CoRWM's principle recommendations of geological disposal, coupled with safe and secure interim storage along with a programme of ongoing research and development as the way forward [3].

The Environment Secretary of State said in October 2006 that planning and development of geological disposal will be based on the following four pillars:

- The Nuclear Decommissioning Authority (NDA) acting as a strong, effective implementing organisation with clear responsibilities and accountabilities;
- Strong independent regulation by the statutory regulators: the Health and Safety Executive, the environment agencies and the Office for Civil Nuclear Security;
- Independent scrutiny and advice to Government by a successor body, built on CoRWM principles;

- Open and transparent partnerships with potential host communities for disposal facilities.

Following a consultation [4], Government published the MRWS White Paper: A Framework for Implementing Geological Disposal in June 2008 [5]. This confirmed that the Government's framework for managing higher activity radioactive waste was geological disposal, with safe and secure interim storage and underpinned by R&D. In parallel it explained that the Government has invited communities to open without commitment discussions about possible future hosting of a geological disposal facility.

Roles and responsibilities

The MRWS White Paper [5] sets out the roles and responsibilities for those parties involved in the implementation of geological disposal as follows:

- **Government** is responsible for the policy, will take final decisions and engage with stakeholders to ensure that the objectives of the MRWS programme are met
- **The NDA** is the implementing organisation, responsible for planning and delivering the geological disposal facility and, as part of this process, will engage with communities and other stakeholders.
- **Communities** with a potential interest in hosting a geological disposal facility will have the opportunity to work with the NDA and others in a partnership approach during the process.
- **Local government** will be fully engaged in a partnership approach and will play a part in local decision-making during the site selection process.
- **Independent regulators** will ensure robust, independent regulation in relation to statutory responsibilities for ensuring that national, EU and international safety, security and environmental legislation and standards are met.
- **Committee on Radioactive Waste Management (CoRWM)** will provide independent scrutiny and advice to Government on the plans and programmes for delivering geological disposal including interim storage.

INVENTORY OF HIGHER-ACTIVITY WASTES

The higher activity radioactive wastes to be managed in the long-term through geological disposal are those that:

- cannot be managed under the "Policy for the Long-term Management of Solid Low Level Radioactive Waste in the United Kingdom" published in March 2007 [6]
- are not managed under the Scottish Executive's (SE's) policy for higher activity waste, currently interim near-surface, near-site storage as announced on 25 June 2007 [7].

In the MRWS White Paper the Baseline Inventory has been given, this is shown below in Table II.

Table II: Baseline Inventory

Materials		**Packaged volume**		**Radioactivity** (At 1 April 2040)	
	Notes	**Cubic Metres**	**%**	**Terabequerels**	**%**
HLW	1, 2, 3, 5	1,400	0.3%	36,000,000	41.3%
ILW	1, 2, 5	364,000	76.3%	2,200,000	2.5%
LLW (not for LLWR)	1, 2, 5	17,000	3.6%	<100	0.0%
Spent nuclear fuel	1, 4, 5	11,200	2.3%	45,000,000	51.6%
Plutonium	1, 4, 5	3,300	0.7%	4,000,000	4.6%
Uranium	1, 4, 5	80,000	16.8%	3,000	0.0%
Total		**476,900**	**100**	**87,200,000**	**100**

Notes:

1. Quantities of radioactive materials and wastes are consistent with the 2007 UK Radioactive Waste Inventory (UKRWI) [8].
2. Packaging assumptions for HLW, ILW and LLW not suitable for disposal at the existing national LLWR are taken from the 2007 UKRWI. Note that they may change in the future.
3. The HLW packaged volume may increase when the facility for disposing the canisters, in which the vitrified HLW is currently stored, has been implemented.
4. Packaging assumptions for plutonium, uranium and spent nuclear fuels are taken from the 2005 CoRWM Baseline Inventory [9]. Note that they may change in the future.
5. Radioactivity data for wastes and materials was derived using the 2007 UK Radioactive Waste Inventory. 2040 is the assumed start date for the geological disposal facility.
6. It should be noted that at present the Baseline Inventory is based on UK Inventory figures, and as such, currently contains waste expected to be managed under the Scottish Executive's policy of interim near-surface, near-site storage as announced on 25 June 2007 [7].

These figures are calculated on a number of detailed assumptions and can only be taken as indicative because legacy waste amounts will change over time due, for example, to changes in planned operations and ability to reduce the amounts of waste for disposal through application of the waste hierarchy[1]. In practice, there may also be some types of waste – for example, the graphite cores from Magnox nuclear reactors – where alternative management options could alter the inventory of waste destined for geological disposal. NDA competitions will introduce international expertise in decommissioning and waste management that could lead to other options being proposed and implemented in due course.

We periodically publish an inventory of radioactive waste in the UK. As shown in Table II this was based on the position as at 1 April 2007. Changes in the UKRWI, and hence the Baseline Inventory, will occur and our next inventory will be based on the position as at 1 April 2011. The estimated quantity and the types of waste to be consigned to a disposal facility needs to be visible and regular UKRWI updates will ensure transparency and indicate the nature of these changes. Any final agreement

[1] This is the use of a hierarchical approach to minimise the amounts of waste requiring disposal. The hierarchy consists of; non-creation where practicable; minimisations of arisings where the creation of waste is unavoidable; recycling and reuse; and, only then disposal.

with a community on a preferred site for the geological disposal facility will need to address possible changes to the Inventory in future years.

GEOLOGICAL DISPOSAL

Geological disposal involves isolating radioactive waste deep inside a suitable rock formation to ensure that no harmful quantities of radioactivity ever reach the surface environment. It is a multi-barrier approach, based on placing wastes deep underground, protected from disruption by man-made or natural events. Geological disposal is internationally recognised as the preferred approach for the long-term management of higher activity radioactive waste and is the policy adopted by the UK Government.

The MRWS White Paper [5] sets out how geological disposal of higher activity radioactive waste will be implemented, including safe and secure interim storage up until disposal. It also acknowledges the need for ongoing research and development to support safety case development and explains the generic design features that a disposal facility would need to include.

The NDA will engage with stakeholders and the public throughout the development and implementation process. Some of the more detailed aspects of facility design will be addressed in more detail over future years and some aspects will depend on discussions with potential host communities.

It is recognised that a robust programme of interim storage will play an integral part in implementing geological disposal. The Nuclear Decommissioning Authority (NDA) has reviewed the UK waste storage arrangements [10]. The regulators and Government have been closely involved in this work and possible consolidation of waste storage will be reflected in the next NDA Strategy due to be published in 2011.

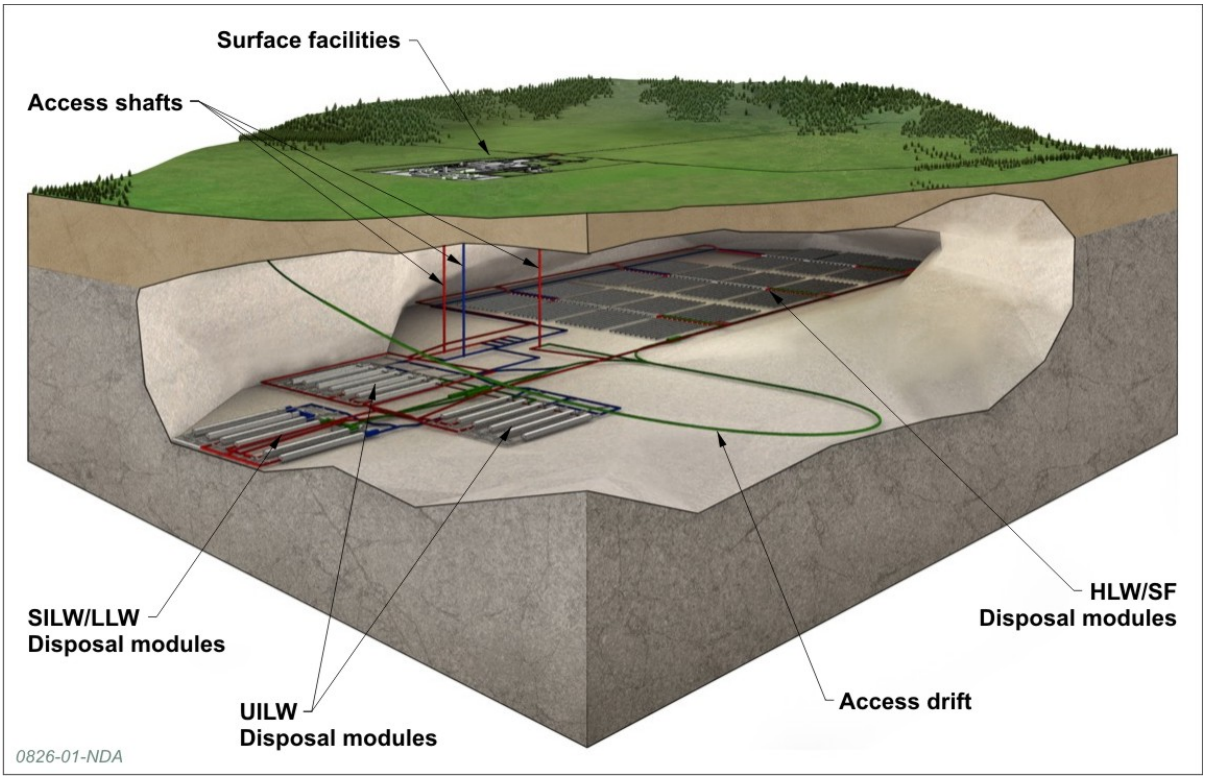
Some of the waste to be placed in a geological disposal facility will remain radioactive and thus potentially hazardous for hundreds of thousands of years. The principle of geological disposal is to isolate the waste deep inside a suitable rock formation to ensure that no harmful quantities of radioactivity reach the surface environment. Meanwhile the process of radioactive decay will continue reducing the hazard of the waste until it eventually presents no further danger.

To achieve this, the waste will be placed in an engineered underground containment facility - the ‘geological disposal facility’. The facility will be designed so that natural and man-made barriers work together to minimise the escape of radioactivity. It is possible that some radioactivity from the facility will eventually reach the surface. But the disposal facility will be designed to ensure that risks arising from such release would be insignificant compared to the levels of radioactivity all around us in the environment from natural background sources. The natural process of radioactive decay over time will assist this aim.

The detailed layout and design of the basic geological disposal facility, both above and below ground, will be tailored to the Baseline Inventory and the geography and specific geological characteristics at the site in question. An illustrative co-located facility structure is shown in Figure 1 (it should be noted that the underground areas

need not necessarily be constructed on a single level but can be layered to take account of the most advantageous local geology).

Figure 1 – An illustrative co-located facility



The need for more research and development has been recognised. The NDA has statutory responsibility under the Energy Act 2004 for carrying out research to support the activities for which it is responsible. The NDA is undertaking further research during the geological disposal facility development process to, for example: refine facility design and construction; improve understanding of the chemical and physical properties and interactions of emplaced waste; address specific issues raised by regulators; and support the development of site-specific safety cases.

The NDA's Radioactive Waste Management Directorate already has a focused research and development programme in support of geological disposal. Following a consultation exercise a revised R&D Strategy has been published [11].

IMPLEMENTATION ARRANGEMENTS

In the MRWS White Paper the Government has placed responsibility for planning and implementing geological disposal with the NDA, so as to enable the NDA to take an integrated view across all waste management activities, with both long and short term issues addressed in planning and strategy development. Since then the NDA has established a new Radioactive Waste Management Directorate (RWMD), incorporating resources from the former United Kingdom Nirex Ltd, which it will develop into an effective delivery organisation to implement geological disposal.

It is envisaged that RWMD will evolve under the NDA into the 'NDA's delivery organisation'. This organisation will be responsible for the delivery of the geological disposal facility and in due course its ownership can be opened up to competition in line with other NDA sites. Further dialogue with Government, the regulators and the supply chain will be required before this step is taken to determine whether this is the appropriate implementation approach.

As part of this evolution the Environment Agency, Health and Safety Executive and Department for Transport (collectively termed 'the regulators') as the principal regulators for the development of a geological disposal facility (GDF) undertook a review of RWMD's organisation. This was to guide the NDA's development of Radioactive Waste Management Directorate (RWMD) into a Site Licence Company (SLC) to implement geological disposal.

Establishing a Site Licence Company (SLC) to implement geological disposal will take some years. Plans involve the establishment of RWMD as separate subsidiary organisation to NDA , and then establishing an organisation capable of holding the environmental permits needed to enable intrusive site investigations at a candidate site (or sites). At a later date, before the start of underground operations, the organisation will need to be capable of holding a nuclear site licence. During this time RWMD will need to ensure it continues to support the disposability assessment process as a means of providing advice on the compatibility of proposals for packaging wastes with the requirements of geological disposal.

The regulators agreed that RWMD should aim to develop into a "Prospective" Site Licence Company by December 2009 as a first step towards RWMD achieving the appropriate organisational status. This intermediate status would assist transparent oversight by regulators and would be termed 'Prospective SLC'.

Together with NDA and RWMD we agreed that the 'Prospective SLC':

- will provide separation between the strategic responsibilities of corporate NDA and RWMD's development work (including, for example, planning for implementation, investigating and assessing specific candidate sites and specifying packaging standards and the associated LoC process);

- will embody the culture and demonstrate the competences, of a company that is to hold an environmental permit and a nuclear site licence including having an independent assurance function; and

- will be a stable organisation that meets the immediate needs of the business, its regulators and others.

A regulatory review of the RWMD policies and procedures took place with a report being published in December 2009 [12]. This sets out the regulators findings. In brief they believe that RWMD has made significant progress in working towards the status of 'Prospective SLC'. While this is a positive step, they believe that further development is needed to demonstrate that the principles (including the criteria) have been fully achieved. This will require RWMD to start operating as a Prospective SLC under voluntary regulatory scrutiny to address the issues raised in our review. They

are confident that this is achievable and are committed to working with RWMD to support this, and further organisational development to ensure the success of the geological disposal programme. RWMD is working on the list of recommendations that were produced. For example the RWMD Executive is undertaking a review of RWMD's organisational structure to ensure we have the right organisation to deliver our programme, mission and objectives in the most efficient manner.

Public and stakeholder engagement

NDA and RWMD will work in partnership with potential host communities throughout the process of geological disposal facility siting, development and operation. This will enable engagement with those stakeholders and members of the public who would be affected by development of a geological disposal facility. It is also likely that some high level engagement with Host Communities and their Decision Making Body/ies will need to be led by central Government.

Following consultation, the NDA has published its *Public Stakeholder and Engagement and Communications Strategy* [13]. Stakeholders provided comments and views on what they want from; engagement with the NDA, the timing of that involvement and their preferred means of engagement.

Public consultation is also a requirement both of the planning permission process, where the public will be consulted on the planning application and the accompanying environmental statement, and as part of the environmental regulator's decision on whether to grant an authorisation to dispose of radioactive waste. The SEA, SA and EIA processes will also provide opportunities for public engagement. The NDA has also consulted on and published its *Sustainable Assessment and Environmental Appraisal Strategy* [14].

REGULATION

Robust, effective and independent regulation is vital for public confidence in a geological disposal facility programme which meets high safety, security and environmental standards based on comprehensive risk assessment and management.

The UK Government is committed to achieving this with strong and effective control and regulation of the geological disposal facility development process. This will be enforced in the following way:

- The NDA and RWMD will comply with the appropriate regulatory and planning processes
- Government will look to early and continued involvement of the safety, environmental, security, transport and nuclear safeguard regulators throughout the MRWS implementation programme
- The regulators will make clear their regulatory requirements to RWMD at an early stage
- Government will expect the RWMD, in discussion with relevant planning authorities and the regulators, to develop a coordinated strategy for seeking the necessary planning permission and regulatory approvals, with roles, responsibilities and any 'hold-points' clearly identified

- Environmental impact and sustainability issues will be assessed through application of the Strategic Environmental Assessment (SEA), Sustainability Appraisal (SA) and Environmental Impact Assessment (EIA) processes
- Regulatory processes for granting any necessary licences or authorisations will provide opportunity for input and assessment of public and stakeholder views
- Regulatory reviews will be published, and regulatory decision-making processes will be open and transparent while taking account of necessary issues such as national security and commercial confidentiality.

The UK has a strong and effective regulatory regime delivered principally through the following bodies:

- Health and Safety Executive (HSE)
- Office for Civil Nuclear Security (OCNS)
- Environment agencies (the Environment Agency, and the Environment and Heritage Service of the Department of the Environment, Northern Ireland)
- Department for Transport (DfT).

Regulatory bodies will work closely together to ensure the regime as a whole is coherent, effective and efficient. Individual aspects of regulation will be carried out in accordance with the statutory responsibilities of each regulatory body and will be clearly delineated. Implementation of the geological disposal facility programme by the NDA will comply fully with relevant UK and international legislation and conventions.

The NDA's delivery organisation will meet all relevant regulatory requirements in its delivery of the geological disposal facility. It will be the responsibility of the delivery organisation to ensure that its programme is appropriately coordinated as part of a staged application and approval process to ensure that permissions are obtained in the right order. The geological disposal facility will comply fully with the requirements of the independent regulators.

Independent scrutiny

The UK Government and the devolved administrations' statement of October 2006 [3] made clear that Government will ensure strong independent scrutiny of the proposals, plans and programmes to deliver geological disposal.

Accordingly, the Committee on Radioactive Waste Management (CoRWM) has been reconstituted, with modified terms of reference and expertise. The Committee will provide independent scrutiny and advice to UK Government and devolved administration Ministers on the long-term radioactive waste management programme, including storage and disposal. CoRWM will undertake its work in an open and consultative manner.

VOLUNTARISM AND PARTNERSHIP

Government believes that an approach based on voluntarism and partnership is the best means for siting a geological disposal facility. Government does not wish to be over-prescriptive about the way that the voluntarism and partnership arrangements

should work at the outset as individual local circumstances differ and, to a degree, a tailored approach to any discussions will need to be taken. However, this does not apply to the way in which technical issues, such as geology, are assessed, where there will be objective and consistent assessment.

'An approach based on voluntarism' means one in which communities voluntarily express an interest in taking part in the process that will ultimately provide a site for a geological disposal facility. Initially communities will be invited to express an interest in finding out more about what hosting a geological disposal facility would mean for the community in the long-term.

Participation up until late in the process, when underground operations and construction are due to begin, will be 'without commitment' to further stages, whether on the part of the community or Government. If at any stage a community or Government wished to withdraw then its involvement in the process would stop. In practice, development could also be halted by the independent regulators at any point in the process through a refusal to grant authorisations for the next stage of work.

The MRWS White Paper [5] identifies three types of community;

- **Host Community** - the community in which any facility will be built. This will be a small geographically defined area and include the population of that area and the owners of the land. For example, it could be a town or village.
- **Decision Making Body** – the Local Government decision-making authority for the host community.
- **Wider Local Interests** - other communities that have an interest in whether or not a facility should be built in the Host Community. Such as the next village, a neighbouring district or a community on the local transport routes to the Host Community.

All three levels of community, will need to liaise closely with one another as the process is taken forward. Both Government and the NDA will engage with all three 'communities'.

By a partnership approach Government means the setting up of a formal Community Siting Partnership such that the Host Community, Decision Making Bodies and Wider Local Interests will work with the NDA's delivery organisation and with other relevant interested parties to achieve a successful outcome. This could be by ensuring that questions and concerns about the geological disposal facility siting, construction, operation, closure and post-closure are addressed and resolved as far as reasonably practicable and that the project contributes to a community's further development and well-being.

The Right of Withdrawal (RoW) is an important part of the voluntarism approach intended to contribute to the development and maintenance of community confidence. Up until a late stage, when underground operations and construction are due to begin, if a community wished to withdraw then its involvement in the process would stop. As with other key local decisions in the siting process, the Decision Making Body will be responsible for exercising the RoW, based on advice and recommendations from the Community Siting Partnership.

All parties in a Community Siting Partnership should work positively to seek to avoid the need to exercise the RoW. This will be particularly important following a surface-based investigation programme, when considerable investment will have already been made.

To help avoid the need to exercise the RoW late in the process, it is proposed that the stated objectives of a Community Siting Partnership include seeking to develop partner and local community confidence that:

- there is a good prospect for developing an acceptable environmental safety case
- the potential development is likely to be able to address the planning requirements of the planning authority.
- a Community Benefits Package will be agreed such that the overall balance of benefits and any perceived detriments will reflect the needs of local communities and their future generations
- the question of potential retrievability of wastes has been adequately considered taking account of regulatory constraints.

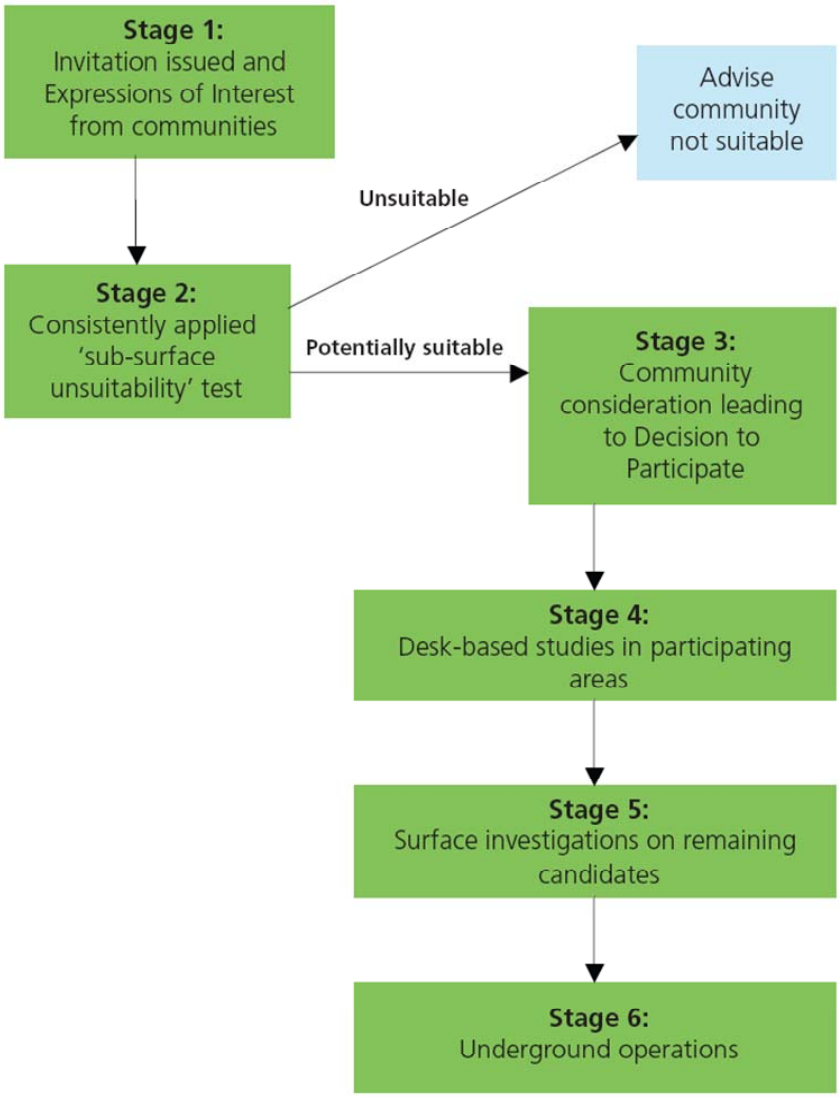
Government has decided that an Engagement Package and a Community Benefits Package will form part of its voluntarism and partnership approach, subject to them being affordable and offering good value for money. This would recognise that a community which expressed an interest in hosting a facility should be enabled to participate in the selection process; and that a community which hosts a geological disposal facility for higher activity radioactive wastes will be volunteering an essential service to the nation. A community will want to ensure that the impact of a geological disposal facility on their long term social and economic prospects is understood and that the needs of future generations are addressed appropriately.

It could be at least a century until final closure of an entire facility is possible and so the development and operation of a geological disposal facility is an intergenerational issue. The local needs arising from the development are also likely to have an inter-generational element.

Site selection process

The site selection process will be a staged process, allowing all those involved to take stock before deciding whether or not to move to the next stage at a particular site. Figure 2 below indicates the main stages in the process.

Figure 2 – Stages in the Site Selection Process



The programme for developing a geological disposal facility needs to be flexible and able to incorporate both robust technical site investigations and ongoing interactions between the project and the Host Community. This may mean accommodating longer discussion periods and more research to address stakeholders' concerns. There is nevertheless, the need to maintain momentum in taking forward this important programme to ensure the safe and secure long-term management of higher activity radioactive waste in the UK.

LATEST POSITION

The Government continues with the siting process for a geological disposal facility based on a voluntarism and partnership approach. The MRWS White Paper published on 12 June 2008 marked a significant milestone. At the same time Government also invited communities to express an interest in opening up without commitment discussions on the possibility of hosting a geological disposal facility at some point in the future.

Since then some progress has been made, Allerdale Borough Council and Copeland Borough Council in West Cumbria and Cumbria County Council have formally expressed an interest 'without commitment' to Government.

They have established the West Cumbria MRWS Partnership as an advisory body aiming to "make recommendations to Allerdale Borough Council, Copeland Borough Council and Cumbria County Council on whether they should participate or not in the geological disposal facility siting process, without commitment to eventually host a facility". They have established a web site (http://westcumbriamrws.org.uk/) where more information can be found. The Partnership is aware that significant public and stakeholder engagement (PSE) will be required in its work programme. This is due firstly to the requirements set out in the MRWS White Paper and secondly due to the moral and practical need to engage widely on an issue of such sensitivity, especially given the history of nuclear waste management in West Cumbria.

The NDA is also helping inform the debate by publishing key publications. In spring of 2010 it published *Geological Disposal: Steps towards implementation* [15] and in early 2011 the plan is to publish a suite of documents supporting a generic disposal system safety case.

The British Geological Survey (BGS) was commissioned by the Department of Energy and Climate Change (DECC) to look at the Copeland and Allerdale areas. It published a report on 28 October 2010 entitled *Initial Geological Unsuitability Screening of West Cumbria* [16]. This report does not show where a facility would eventually be located, but is simply intended to avoid unnecessary work in areas which are clearly unsuitable for the underground facilities based on high level geological exclusion criteria.

All of this shows that steady progress is being made in the UK. Different stakeholder groups including; the Government, regulators, local communities and the NDA are working in partnership to successfully implement geological disposal.

9. References

1. Royal Commission on Environmental Pollution, Sixth Report, "Nuclear Power and the Environment", September 1976, Cm. 6618.

2. Committee on Radioactive Waste Management, "Managing our Radioactive Waste Safely- CoRWM's Recommendations to Government", July 2006. CoRWM Document 700. Available at http;//www.corwm.org.uk

3. UK Government and the devolved administrations, "Response to the Report and Recommendations from the Committee on Radioactive Waste Management (CoRWM)", (PB 12303) October 2006. http://www.defra.gov.uk/environment/radioactivity/waste/pdf/corwm-govresponse.pdf

4. Defra, BERR and the Welsh and Northern Ireland devolved administrations, "Managing Radioactive Waste Safely: A Framework for Implementing Geological Disposal", 25 June 2007. http://www.defra.gov.uk/corporate/consult/radwaste-framework/index.htm

5. Defra, BERR and the devolved administrations for Wales and Northern Ireland, Managing Radioactive Waste Safely: A framework for implementing geological disposal, A White Paper, June 2008.

6. Defra, DTI, Scottish Executive, Welsh Assembly Government, Northern Ireland Department of the Environment, "Policy for the Long Term Management of Solid Low Level Radioactive Waste in the United Kingdom", March 2007. http://www.defra.gov.uk/environment/radioactivity/waste/pdf/llw-policystatement070326.pdf

7. The Scottish Government, "Ministers Decline to Endorse Deep Storage", 25 June 2007. News release available at http://www.scotland.gov.uk/News/Releases/2007/06/25101822

8. UK Radioactive Waste Inventory 2007 May 2008. See http://www.nda.gov.uk/strategy/waste/geological-disposal.cfm

9. Committee on Radioactive Waste Management, "CoRWM's Radioactive Waste and Materials Inventory", July 2005. CoRWM Document 1279. http://www.corwm.org.uk

10. Nuclear Decommissioning Authority, UK Radioactive Higher Activity Waste Storage Review, March 2009. http://www.nda.gov.uk/documents/upload/UK-Radioactive-Higher-Activity-Waste-Storage-Review-March-2009

11. Nuclear Decommissioning Authority, "NDA Radioactive Waste Management Directorate – Research and Development Strategy", March 2009. See http://www.nda.gov.uk.

12. Environment Agency, Health and Safety Executive, and the Department for Transport, Development of a Prospective Site Licence Company to implement Geological Disposal - Report of a joint regulatory review, December 2009 http://www.environment-agency.gov.uk/static/documents/Business/RWMD_review_report_final.pdf

13. Nuclear Decommissioning Authority, Public and Stakeholder and Communications Strategy for Geological Disposal, July 2009

14. Nuclear Decommissioning Authority, Sustainable Assessment and Environmental Appraisal Strategy, July 2009

15. Nuclear Decommissioning Authority, Geological Disposal: Steps towards implementation, March 2010. https://www.nda.gov.uk/stakeholders/newsletter/underground-disposal-plans-outlined.cfm

16. British Geological Survey, *Initial Geological Unsuitability Screening of West Cumbria*, October 2010. http://mrws.decc.gov.uk/en/mrws/cms/Disposal/Site_selection/Initial_screen/west_cumbria/west_cumbria.aspx