

Nuclear Waste Advisory Associates (NWAA)

Question	Agree	Response
<p>Introduction to letter answering consultation questions</p>		<p>Nuclear Waste Advisory Associates (1) (NWAA) Response.</p> <p>Introduction</p> <p>Nuclear Waste Advisory Associates (NWAA) is an independent group of experts with a collective experience of nuclear issues of well over 200 years. We aim to provide information and advice on the risks posed by radioactive waste, and support to decision makers, stakeholders and communities involved in its management. Our membership includes former members of the Radioactive Waste Management Committee (RWMAC) and the Committee on Radioactive Waste Management (CoRWM(i)) and former campaigners who worked for environmental organisations.</p> <p>In March 2010, NWAA produced an Issues Register which lists 101 outstanding scientific and technical issues relating to the production of a robust safety case for the deep geological disposal of radioactive waste.(2) Since producing it we have held various discussions with the Environment Agency, the Nuclear Decommissioning Authority (NDA) and the Health and Safety Executive. It is our view that these outstanding issues need to be resolved, if indeed it is possible to resolve them, at generic level before the Government gives the go-ahead to the continued search for a repository for legacy waste, and at a site specific level, before it embarks on a new nuclear build programme which will give rise to the generation of yet more nuclear waste.</p> <p>The Nuclear Decommissioning Authority (NDA) published a response to the Nuclear Waste Advisory Associates' Issues Register in April 2011 (3) and further detailed its approach to managing outstanding scientific and technical issues in a report in August 2011.(4) A second edition of this report is expected soon. The NDA's register of issues now lists over 900 outstanding issues.(5)</p> <p>NWAA members have given presentations to the Partnership in the past on ethics, the inventory and the NWAA Issues Register.</p> <p>While the Partnership appears content with only "suitable regulatory and planning processes" and it appears to be satisfied that the NDA has suitable capability and processes in place to deal with these outstanding scientific and technical issues, NWAA remains of the view that further independent scrutiny work needs to be carried out before any further decisions are taken. The NDA needs to be far more open and transparent about how research on these outstanding issues is being carried out and it needs to acknowledge that simply agreeing to carry out the research does not necessarily mean it will get the answer it wants.(6) Funds need to be provided for scrutiny work to be carried out, including by critical voices.</p> <p>The remainder of our response to the Partnership's consultation document will be given as answers to the questions posed in that document.</p> <p>Footnotes</p>

		<p>1 http://www.nuclearwasteadvisory.co.uk/</p> <p>2 http://www.nuclearwasteadvisory.co.uk/wp-content/uploads/2011/06/NWAA-ISSUES-REGISTERCOMMENTARY.pdf</p> <p>3 Geological Disposal: Response to Nuclear Waste Advisory Associates' Issues Register, NDA, April 2011 http://www.nda.gov.uk/documents/biblio/upload/NDA-RWMD-Technical-Note-GD-Response-to-Nuclear-Waste-Advisory-Associates-Issues-Register.pdf</p> <p>4 RWMD Approach to Issues Management, NDA, August 2011 http://www.nda.gov.uk/loader.cfm?csModule=security/getfile&pageid=47986</p> <p>5 Number mentioned verbally at Geological Disposal Implementation Board meetings. The Update on RWMD Approach to Issues Management, NDA/RWMD 25th November 2012 gives the figure as 500. The note also says that 400 internally raised issues have been removed because these have already been identified as information needs within the RWMD R&D programme.</p> <p>6 The Environment Agency has pointed out that it is possible that the results of disposal research programmes may not actually indicate that disposal would be safe. "Environment Agency, Response to Nuclear Decommissioning Authority Consultation on – Radioactive Waste Management Directorate Proposed Research and Development Strategy", Environment Agency, November 2008. http://www.environmentagency.gov.uk/static/documents/Research/1976__RWMD_Proposed_RD_strategy.pdf see page 6</p>
1 – Geology	No	<p>Disposal of radioactive wastes in a coastal environment of sedimentary cover over fractured basement close to a hinterland with high relief and consequent high potential heads is not the prime choice for a geologically safe environment for a Geological Disposal Facility (GDF).</p> <p>Despite the current process having greater transparency with pro-active, but in NWAA's view, inappropriate and inadequate, public consultation, the fundamental requirement of any potential site remains unchanged i.e. geological, hydrogeological, geotechnical and geophysical suitability.</p> <p>If an area has permeable sediments (which may not presently be exploited as a major or minor aquifer), overlying igneous, metamorphic or volcanic rocks which are invariably fractured, on both micro- and macro scales, it is obviously not the "best" site in the wider scheme of geologic environments.</p> <p>Indeed, with reference to the previous zoning by the British Geological Society (BGS), the areas currently under consideration, in the northern part of west Cumbria, were considered unsuitable, on regional geological criteria.(7)</p> <p>A good summary of UK progress on the processes of consideration on deep geological disposal of radioactive wastes and the proposals for a (GDF) is given in the Non-Technical Summary; Managing Radioactive Wastes Safely: Initial Geological Unsuitability Screening of West Cumbria. (8) The full report (Managing Radioactive Wastes Safely: Initial Geological</p>

Unsuitability Screening of West Cumbria; BGS 2010), presents an updated thorough review of the geology of West Cumbria.(9)

It must be recognised the information available for vitally important digital modelling of this area, in terms of the data available, the understanding of that data, assessment methodology, the geological structures, the hydrogeology, geotechnics and rock mechanics have not changed since the unsuccessful UK NIREX planning inquiry into proposals for a GDF at Longlands Farm in 1995/96.

Three dimensional geological modelling capabilities (e.g. using packages such as GSI3D, GoCad, Petrel etc. Haslam; 2012) at BGS and by others, have in recent years significantly changed in power and applicability for any potential GDF site proposal. However, to properly characterise such a facility adequately, in the context of typical oil industry exploration activities (the usual application for such complex modelling approaches), far more data than that acquired in the Sellafield- Longlands Farm Potential Repository Zone (PRZ) and district investigations, carried out by UK Nirex during the 1980s and early 1990s, should be available. A conservative approach would be at least twice as much data, with twice as much detail, over at least a 20 km square area, and at least to 2 kms in depth. Since this work (from 1986 through to 1996) cost over £500m, a major exploration commitment is necessary for any new proposed potential UK GDF site.

For example RWMAC (the DoE/DEFRA Radioactive Waste Management Advisory Committee – the predecessor to CoRWM) was advised by the former UK NIREX Directors in 2002, that the costs associated with adequate investigations to support two separate potential GDF locations within the UK Mainland, each requiring 20 deep boreholes for geological assessment, would be at least £7 billion.

The process currently appears to be putting the voluntarist approach ahead of finding the safest possible method to manage these wastes. If we assume that the best method is geological disposal,(10) then the approach currently being followed is putting voluntarism ahead of finding the best geology. There should be a national debate about what constitutes suitable geology and how to find it before proceeding to site selection, whether in West Cumbria or elsewhere.

Choosing a location on public acceptability grounds alone, without prime reference to the requirements of a geologically safe and hydrogeologically inactive location, is environmentally and economically irresponsible, in the opinion of the NWWA. It should also be noted that the current process would not allow a comparative assessment of a variety of different sites in different geological environments as is common practice in other countries.

Footnotes

7 Geoscientist Vol.7 no. 7 pp.18-20 (1997); Kelling G & Knill J

8 <http://mrws.decc.gov.uk/assets/decc/mrws/744-west-cumbria-non-technical.pdf>

9 <http://mrws.decc.gov.uk/assets/decc/mrws/741-west-cumbria-main-report.pdf>

10 NB that the CoRWM report in 2006 proposed disposal 'given the current state of knowledge' on the assumption that knowledge would be enhanced to justify disposal. Note also that a majority of CoRWM members recognized disposal as a least

		<p>worst option and called upon HMG to continue to explore alternative and more appropriate means of radioactive waste management, a recommendation which may render disposal obsolete and archaic.</p>
<p>2 – Safety, security, environment and planning</p>	<p>No</p>	<p>Safety</p> <p>NWAA does not believe it is sufficient for the Partnership to be satisfied that there are suitable regulatory processes in place. Given the scale of the task involved in developing a robust safety case, with over 900 outstanding issues - one geologist has described the safety case as like predicting the weather on a particular day in thousands of years time - NWAA remains of the view that further independent scrutiny work needs to be carried out before any further decisions are taken, and a process needs to be developed with funds provided to allow that scrutiny work to be carried out, including by critical voices. The NDA needs to be far more open and transparent about how research on these outstanding issues is being carried out and it needs to acknowledge that simply agreeing to carry out the research does not necessarily mean it will get the answer it wants.</p> <p>Security</p> <p>Further concentration of nuclear facilities in West Cumbria and transport of materials between sites could lead to increased risk of terrorist attacks. It is noteworthy that the short paragraph addressing the regulation of security (page 38) only makes reference to a 'Site Security Plan' but overlooks security issues raised by the multiple long term transports of nuclear wastes to a GDF host community. The supplementary documentation provided by WCMRWS partnership on security, including DOC 36.1, only makes passing reference (para.3.11) to the need for comprehensive security for nuclear waste in transit. The implications of essential security provisions to en route communities are overlooked. With an estimated 1800 transports a year required to feed the repository over several decades, the security aspects of a GDF are extremely worrying, especially if spent Mox fuel is included in any eventual inventory.</p> <p>Environment</p> <p>An increased concentration of nuclear facilities in West Cumbria must cause additional concerns and be detrimental to tourism in the English Lake District.</p> <p>Planning</p> <p>There appears to be only one brief mention of the possibility of a spent fuel encapsulation plant being built as part of the surface facilities. This would be a major and controversial development in its own right without the associated GDF. Further details should be provided about what such a facility might entail. Current NDA thinking appears to be that the embarrassing length of time (90 years +) between spent fuel discharge and encapsulation might be lessened if spent fuel from different discharge dates was mixed together in the same container, to reduce the overall temperature. The practical implications of such a policy are alarming. It immediately removes any possibility of on-site encapsulation, the most desirable environmental option, and imposes the necessity for a single central store. It is not clear whether any research has been done into the safety of this particular type of waste "mixing". The Partnership should have sought more information on encapsulation and fuel mixing.</p>

		<p>Another outstanding concern is over the consideration of requirements for the retrievability of emplaced radioactive waste in a GDF. Under the subhead 'Timescale of retrievability' (at p76) it states "while the option of retrievability needs to be designed into a repository (possibly in the next several years), any decision to backfill vaults and tunnels can be taken by future generations under circumstances posed at the time (many years away)." This overlooks the need for local planning authorities to consider the size of any surface footprint that would be created by provision of a surface store with sufficient capacity to safely and securely store potentially an entire inventory of radioactive wastes recovered from a GDF were safety conditions to arise in the GDF necessitating the recovery and retrieval of its contents. It is clear the size of store required would be many times larger than the surface waste receipt building, and that such a large engineering task could not be accomplished when needs arise, but must be available as a contingency, if retrieval is to be presented as a meaningful option.</p>
3 – Impacts	No	<p>One of the features of the proposed GDF is the sheer scale of the project. The volume of the underground facilities to accommodate wastes could be the equivalent of between six and eleven Albert Halls with underground footprint could vary from 6km² to 25km². This would require an engineering project the size of the Channel Tunnel creating vast amounts of spoil to be accommodated at the surface. The project will also require transport infrastructure for the movement of wastes and materials. In view of the scale and impact of the project no site should be considered that lies within or near the Lake District National Park.</p>
4 – Community benefits	No	<p>Such packages are, unless very widely distributed, likely to divide communities (on a regional/County scale) into "haves, and have-nots" with particular negative impacts on the tourism industry in West Cumbria. It is therefore important to recognise that many communities far from the community hosting the GDF are also affected communities if they are likely to regularly receive transports of radioactive wastes destined for the GDF through their area. Principle 1 (explicitly) and 8&9 (implicitly) (pages 69-70) identify the importance of recognising other affected communities. What is needed in addition is more detail on how these en route communities would be provided with appropriate benefit from community packages.</p> <p>NWAA also believes that benefits packages should be considered for sites where radioactive wastes are stored for the long-term including potential new reactor sites. The Government should support unequivocally the principles for community benefits set out in the consultation document. Benefits must be sustained over the long term to mitigate burdens that will be borne by future generations.</p>
5 – Design and engineering	No	<p>The NDA, as did its predecessor UK NIREX, places far too much emphasis on engineered barriers to overcome geological, geotechnical and hydro-geological components of a coastal Cumbrian GDF. The selection of a more suitable site, in the total UK geological context would be a better starting point for site selection.</p>
6 – Inventory	No	<p>The DECC/NDA 2010 Upper Inventory only allows for a 10GW new reactor programme. The total volume of packaged waste in this Upper Inventory is given as 1,160,000m³. Much of the increase over and above the baseline inventory is attributable to extending the life of existing reactors. Using NDA's figures it appears that a 16GW new build programme would produce an inventory of 1,221,021 m³.¹¹ The baseline inventory is expected to have a footprint of between 6km² and 10km² depending on the rock type. A maximum inventory, which includes spent fuel from 16GW of new nuclear reactors would have a footprint of between 12km² and 25km². So waste from life extensions and new reactors would take up between about a half to two thirds of the repository. The Partnership should, therefore, stop saying that 70% of the waste destined for the repository is already</p>

		<p>located at Sellafield. In addition, the consultation material should explain to people what type and volume of waste is likely to form the inventory as well as the radiological burden expected to be accommodated in the GDF. The legacy waste alone is expected to produce 78million terrabequerels of radioactivity but with new build waste which is far hotter and contains more fission products produced by the longer burn-up in the reactors, that figure could rise by as much as five times.</p> <p>Footnote</p> <p>11 See Slide 8 here: http://www.nda.gov.uk/documents/loader.cfm?csModule=security/getfile&%20PageID=48680</p>
<p>7 – Siting process</p>	<p>No</p>	<p>Four members of the first Committee on Radioactive Waste Management (CoRWM1), including its first chairperson, wrote to the Secretary of State in November 2009 to point out that the Committee’s proposals for long-term management of radioactive wastes identified a process towards a long-term solution, recognising that deep disposal should be implemented on the basis of ‘an intensified programme of research and development into the long-term safety of geological disposal.’ Such a programme has not been undertaken.(12)</p> <p>Moreover the Committee’s proposals applied to legacy waste only. Should a new build programme be introduced, in CoRWM’s view it would require a quite separate process to test and validate proposals for the management of the wastes arising. In other words the deep geological disposal option was seen by CoRWM as the ‘least-worst’ option which could be applied to existing waste since we have no choice over whether or not we manage that waste. Intentionally creating new waste raises completely different political, technical and ethical issues. Such a process has not been carried out, and there do not appear to be any plans to carry out such a process. Instead the Government’s overzealous pursuit of a repository for West Cumbria seems to be a way of removing radioactive waste as an impediment to building new reactors.</p> <p>If a repository is developed it will not be available for new build wastes until well into the next century, if at all. The methods of storage, the need for encapsulation, the movement of wastes are all unknowns but it is likely that new build sites will be responsible for the management of these wastes for well over a century. Yet there is no debate about the principle of long-term storage let alone the option of volunteering for the communities affected. The voluntarist principle should apply to those communities near new nuclear power stations where wastes, including spent fuel, will be stored for the indefinite future.</p> <p>Footnote</p> <p>12 Letter from Prof Andrew Blowers, Prof Gordon Mackerron, Mary Allan, Pete Wilkinson to Ed Miliband, dated 20th November 2009 http://www.no2nuclearpower.org.uk/news/CoRWM1_Letter_201109.pdf</p>
<p>8 – Overall views on participation</p>		<p>The NWAA view is that the Cumbrian Authorities should NOT take part in the search for somewhere to put a repository.</p> <p>A major waste of public time and money could be in progress unless UK national lessons are learnt from the process. This has happened so often in the radioactive waste disposal debate over the past 50 or so years. The UK has “reinvented so many wheels” and largely ignored lessons learnt from overseas repository consultation and demonstration programmes in the past (e.g. in Sweden, Finland and Germany).</p>

9 – Additional comments		<p>The Partnership says that because government policy is for geological disposal, it is only discussing geological disposal. This approach, particularly where the area of search for a site is selected by a voluntarism approach rather than a geological one, fails to choose the Best Available Technique for the management of waste.</p> <p>10. Conclusions and Recommendations</p> <p>NWAA believes that alternative methods of management have not been given the attention they deserve, and that the Government has taken CoRWM1's recommendations out of context. It is important to remember that, in the original policy recommendations put forward by CoRWM1, geological disposal was part of an approach, not the sole solution. It cannot be available for many decades and must be preceded by a robust programme of interim storage as well as a commitment to an intensified programme of research and development. Moreover, there is no certainty that geological disposal will ever be developed.</p> <p>The current consultation assumes that Deep Geological Disposal is the only immediate first step to the safer management of the more dangerous categories of radioactive wastes currently in the UK inventory. Some of these stores and categories of wastes could be managed in the short term in a far safer manner by better surface storage facilities and management. Choosing a location on public acceptability alone, without prime reference to the requirements of a geologically safe and hydrogeologically inactive location, is environmentally and economically irresponsible.</p> <p>The argument that further investigation in Cumbria, albeit an area which does not have ideal geology, might lead to the designation of a site which can rely heavily on engineered barriers to make a safety case is a dangerous one. NWAA believes moving on to the next stage will create a momentum in the process which is too great to allow withdrawal in future, leading to the selection of an extremely inferior site.</p> <p>NWAA recommends that the Cumbrian authorities should NOT take part in the search for somewhere to put a repository.</p>
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