

Nuclear Free Local Authorities **RADIOACTIVE WASTE POLICY**

Briefing No. 33 – Siting a deep-underground repository

Prepared for NFLA member authorities, March 2012

“GEOLOGICAL DISPOSAL” OF RADIOACTIVE WASTE IN WEST CUMBRIA – NFLA RESPONSE TO THE ‘MANAGING RADIOACTIVE WASTE SAFELY’ PUBLIC CONSULTATION DOCUMENT

i. Background to Consultation and the West Cumbria MRWS Partnership

After more than 60 years of a civil nuclear power programme, the UK is still seeking a long-term solution for what to do with the large levels of higher activity radioactive waste emanating from that programme. Like other countries, in the 1980s and the 1990s the UK nuclear industry’s waste management company NIREX sought to locate a geologically suitable site for the deep-underground storage of higher activity radioactive waste. A site in West Cumbria near the Sellafield nuclear power station was identified, but one of the final decisions of the Conservative Environment Minister John Gummer was to reject NIREX’s analysis and refuse permission to go ahead with such a development in 1997. Geological and technical uncertainties were an important factor in this decision.

The incoming Labour Government established the independent Committee on Radioactive Waste Management (CORWM) to advise it on the way forward in finding a publicly acceptable long-term solution for the management of radioactive waste. CORWM recommended to Government that ‘geological disposal’ was the best available long-term approach compared to other ways of managing higher activity radioactive waste. It also recommended that the UK Government seek formal expressions of interest to host such a facility, and as a result all Councils in the UK were written to in order to seek a volunteer community to take part in this process. This process has been continued by the Coalition Government. The Scottish Government has developed a different policy for the management of Scottish higher activity waste of ‘near site, near service’ monitorable and retrievable stores, a policy the NFLA broadly supports.

The only Councils that expressed an initial interest to the UK Government to participate in the process to locate a site for a ‘geological disposal facility’ were Copeland and Allerdale Councils in West Cumbria, in partnership with Cumbria County Council. The three Councils established a cross-sector community partnership, in a process funded by the Government, to consider a variety of issues relating to the potential hosting of a repository in West Cumbria, and to advise it on whether it should go forward with expressing a more formal interest in the voluntarist process with this facility.

The West Cumbria Managing Radioactive Waste Safely Partnership has been holding a large number of meetings and exhibitions to reach a variety of communities in the county. In November 2011 it launched a public consultation to seek wider views on whether to take this process further. The consultation closes on March 23rd 2012.

The Nuclear Free Local Authorities have developed this Radioactive Waste Briefing for its member authorities to provide it with a copy of its submission to the public consultation. It recommends NFLA members endorse the consultation and consider developing their own response supporting the NFLA submission.

To respond to the consultation email contact@westcumbriamrws.org.uk or send to Freepost RSKT-LTXU-HAYC, West Cumbria MRWS Partnership, Copeland Borough Council, The Copeland Centre, Catherine Street, Whitehaven, CA28 7SJ.

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Further details on the consultation and background information can be found on the West Cumbria MRWS website – <http://www.westcumbriamrws.org.uk>.

Those responding to the consultation may also wish to consult the website of the campaigning network group ‘Save our Lake District’ which has been set up by a number of environmental and nuclear concerned groups in Cumbria – <http://www.mrwsold.org.uk> – and which provides a useful local perspective of those concerned about the development of such a facility near the Lake District National Park.

ii. Executive Summary of NFLA response

- The Nuclear Free Local Authorities does not believe the areas covered by Allerdale and/or Copeland Borough Councils should take part in the search for somewhere to put a nuclear waste repository.
- The NFLA view is that it will be impossible to demonstrate with any scientific credibility that the resultant radiation dose to people from a nuclear waste repository would be at an acceptably low level into the far distant future.
- NFLA understands that CoRWM’s recommendation was contingent on there being much more research into the uncertainties associated with deep geological “disposal” as well as robust interim storage before proceeding to a site selection process.
- If voluntarism is to mean anything, local communities must be given the right to withdraw from the process at any time up to the start of construction. Local Authorities must not be allowed to override local wishes.
- The NFLA agrees with CoRWM that a new nuclear programme raises different political and ethical issues when compared with the consideration of legacy wastes. CoRWM said new wastes should be subject to a separate public assessment process. By going ahead to the next stage of the process before the generation of new wastes has been given adequate consideration Cumbrian authorities will be being complicit in depriving other authorities (for example those on waste transport routes) of a proper say on the future of UK energy policy.
- The NFLA view is that there should be a national debate about what constitutes suitable geology and how to find it before Cumbrian authorities proceed to the next stage. We should not allow the voluntarist approach to override the idea of finding the safest possible method to manage these dangerous wastes.
- **The Partnership should have made clear in the consultation materials that, in the event of a 16GW new build programme around half of the waste, by volume, destined for the repository is not yet located in Cumbria.**
- Given that the Government has agreed with the Partnership’s third Inventory Principle to inform a Community Siting Partnership at the earliest opportunity when significant changes occur to the ‘upper’ inventory, the Partnership should have pressed DECC to produce an upper inventory which looked at a 16GW new nuclear programme.
- DECC has said it will discuss emplacing spent fuel from new nuclear reactors in the repository with the host community if the process proceeds – implying that the community would have the option of deciding only to accept legacy wastes. The Partnership needs to ask DECC now what the implications would be if the host community said it would only take legacy waste. The Partnership also needs to ask DECC to address the issue of the probability that the risk limit for a single repository being exceeded in the event of inclusion of waste from new reactors.
- **It is the NFLA view that, should the Cumbrian authorities move on to the next stage, the momentum in the process will be too great to allow withdrawal in future. Cumbria could, therefore end up not only with a disposal facility which takes all the spent fuel from new reactors, but also with more than one dump.**

1. Introduction

- 1.1 The dictionary definition of disposal is “to get rid of something”. Unfortunately placing nuclear waste in a deep geological facility does not get rid of it because it has a life of many thousands of years. In that time dangerous radioactivity could be transported back to the

surface and distributed around the environment presenting a danger to the health of populations living on the surface.

- 1.2 The NFLA opposes 'deep disposal' partly because of the uncertainty involved in making a safety case. The Nuclear Decommissioning Authority (NDA) and the Environment Agency appear to agree that whilst a deep disposal facility would leak and release radioactivity which could reach the surface, the rate of such leakage can be accurately predicted and is expected to be sufficiently slow that the resultant doses would not be of concern. NFLA believes there is insufficient evidence to support this hypothesis, and that in fact the rate of leakage is likely to be much greater than expected.
- 1.3 The burial of nuclear waste is said to remove the burden on future generations. But assuming the waste is eventually made irretrievable if radionuclides do leak at a faster rate than expected, this problem could not be rectified. This would then create a significant burden for future generations, rather than removing the burden from them. Given the possibility of a high degree of repository leakage, the precautionary approach would be to leave future generations the option of managing the waste in the best way they see fit.
- 1.4 A nuclear waste repository safety case is required to demonstrate that the resultant dose to people would be at an acceptably low level. (1) **In the NFLA view demonstrating that such a dose target is achievable is simply not scientifically possible in practice.** It is in the nature of chemical elements and geological and biological systems to behave in a variable and hence unpredictable manner such that they make reliable risk/time calculations into the far future not only difficult but virtually impossible.

2. Distorting CoRWM's recommendations

- 2.1 The Committee on Radioactive Waste Management (CoRWM) made its recommendations to the Government in July 2006. (2) As the consultation document states the committee did recommend that geological disposal of nuclear waste was the best option available within the present state of knowledge, and that there should be a new approach to implementation, based on the willingness of local communities to participate.
- 2.2 However, CoRWM also made important recommendations which the Government has ignored. For instance, because of the uncertainties surrounding the implementation of geological disposal, it recommended that there should be a major research and development programme on both geological disposal and robust interim storage, and a security review of waste stores to see if they could survive a terrorist attack. Interim storage could be needed for at least 100 years, as well as there being a risk the repository programme will be delayed or fail.
- 2.3 CoRWM said it takes no position on the desirability or otherwise of nuclear new build, but that such decisions:

"...should be subject to their own public assessment process [because they] raise different political and ethical issues when compared with the consideration of wastes which already exist".
- 2.4 The Committee also noted that the prospect of a new nuclear programme might undermine support for the Managing Radioactive Waste Safely process. CoRWM specifically said it did not want its recommendations seized upon as providing a green light for new build – yet that is exactly what the Government has been doing. CoRWM warned that new build waste would extend the time-scales for implementation, possibly for very long but essentially unforeseeable future periods.
- 2.5 **NFLA understands that CoRWM's recommendation was contingent on there being much more research into the uncertainties associated with deep geological "disposal" as well as robust interim storage before proceeding to a site selection process.**

3. Voluntarism

- 3.1 The Government says it is committed to an approach based on voluntarism. This means that communities would be asked to express willingness to search for a site for a potential repository, and perhaps ultimately host a facility, rather than having a facility forced upon them. The Government has invited communities across the UK to talk to them about the possibility of having a deep geological repository in their area, but so far the three local authorities covering West Cumbria are the only ones to have expressed an interest.
- 3.2 The consultation document says the Managing Radioactive Waste Safely Partnership (the Partnership), made up of representatives of the three local authorities and other local interest groups, appreciates that it will be of interest to a wider range of people and responses from people living elsewhere in Cumbria and beyond, including visitors to the area and those with an interest in the Lake District National Park are welcomed. All views received will be considered.
- 3.3 However, it is also made clear that whilst this consultation is about helping the Partnership to decide what to recommend to the three local authorities, it is the local authorities that will decide whether to move on to the next stage – the search for a site. Cumbria Councillor Tim Knowles (3) makes clear that the local authorities could override the views of a local community. It is also a matter of concern that, whilst in Copeland all councillors will take part in the decision about whether to move on to the next stage, in Allerdale only the councillors on the Executive will decide, and on Cumbria County Council only the Cabinet will decide. (4)
- 3.4 The consultation document does not make clear that according to the provisions of the Government's White Paper Managing Radioactive Waste Safely, Parishes and Towns will not have the right to withdraw from the process if they are identified for a site. If a community within a specific area **wished to opt out**, it could still be included in the dump proposals - if the decision makers (i.e. the three local authorities) gave 'justification' for doing so. This is stated in the second paragraph of (e), page 93 of the consultation document. This means there are significant risks of communities being steamrollered, by financial concerns, or forced, through the 'justification' of others, to be involved in the dump. (5)
- 3.5 The South Lakeland District Council representatives on the MRWS Partnership have joined Churches Together in Cumbria in deciding they cannot support going into the next stage of the search for a nuclear dump site in West Cumbria. Six Parish and Town Councils have also voted against the proposals. For the Parish and Town Councils the lack of the right to withdraw, despite all the talk of volunteerism, has caused them to express deep concern about the process. (6)
- 3.6 **If voluntarism is to mean anything, local communities must be given the right to withdraw from the process at any time up to the start of construction.**

4. Alternatives to 'Geological Disposal'

- 4.1 The Partnership says Government policy is for geological disposal, so it is only discussing geological disposal and not other potential approaches to managing higher activity radioactive wastes in the long term. The danger of this approach is that the councils could decide to move on to the siting process because they are concerned that something needs to be done to manage radioactive waste and a deep geological repository is the only option, rather than choosing the Best Available Technique for the management of waste.
- 4.2 Local authorities and other organisations may want to comment on this consultation document, not just because of a concern about the impact of a deep geological repository on the Lake District National Park, but also because of the implications of a repository for

UK energy policy. These views should also be taken into account even where they do not agree with the Government's policy of favouring a deep repository.

- 4.3 **The NFLA agrees with CoRWM that a new nuclear programme raises different political and ethical issues when compared with the consideration of legacy wastes. CoRWM said new wastes should be subject to a separate public assessment process. By going ahead to the next stage of the process before the generation of new wastes has been given adequate consideration Cumbrian authorities will be being complicit in depriving other authorities (for example those on waste transport routes) of a proper say on the future of UK energy policy.**

5. Geology

- 5.1 The Partnership wants to know what consultees views are on their initial opinions on geology.
- 5.2 Professor David Smythe submitted a number of papers to the Partnership supporting his view that there is currently enough information available to rule out the whole of West Cumbria on geological grounds. (7) Professor Smythe's view is that the evidence is unequivocal - the geology and hydrogeology of West Cumbria are both sufficiently well known and well understood that it is possible to say that no alternative site to the previously chosen 'least unsuitable' option of Longlands Farm (next to Sellafield) can be found in the region. The Partnership also sought other views and evidence. It concluded that the argument that all of West Cumbria should be excluded now on grounds of unsuitability is not generally accepted within the professional geological community.
- 5.3 The Partnership, however, does agree that even if West Cumbria enters the siting process, geological conditions may not provide a suitable site for a repository that meets regulatory requirements. The Partnership emphasises that the process must stop if the geology is found to be unsuitable in the future.
- 5.4 Professor Smythe says that at this stage in the process, it is not the host rock that's important but the regional setting. A regional setting with long geological stability, low hydraulic gradients and simple geology is required. Cumbria has complex geology with high hydraulic gradients. Overall Professor Smythe's main point is that the voluntarist approach should not have been allowed to override the idea of finding areas of suitable geology first. It seems likely that the current approach will end up wasting a lot of time and money because, despite a potentially willing community, there is a high likelihood of not being able to find a suitable site, or alternatively a third-rate site is chosen because the process has travelled so far down the current path that it is difficult to turn back.
- 5.5 **The NFLA view is that there should be a national debate about what constitutes suitable geology and how to find it before Cumbrian authorities proceed to the next stage. We should not allow the voluntarist approach to override the idea of finding the safest possible method to manage these dangerous wastes.**

6. Safety

- 6.1 The specialist independent consultancy group Nuclear Waste Advisory Associates published an Issues Register in March 2010 which lists 101 outstanding scientific and technical issues which will need to be resolved before a safety case can be compiled for a deep geological disposal facility for nuclear waste. (8) Similarly Greenpeace International published a scientific review of international work on the geological disposal of high level radioactive waste. (9)
- 6.2 The Nuclear Decommissioning Authority (NDA) published a response to the Nuclear Waste Advisory Associates' Issues Register in April 2011. (10) This does not appear to have been examined in any depth by the Partnership – it is not mentioned in the consultation document.

- 6.3 Earlier the NDA published its Generic Disposal System Safety Case in February 2011 (although it is dated December 2010). (11) This includes a large number of documents. Also in February 2011 the NDA published a Research and Development Programme Overview. (12) The Partnership asked Professor Stuart Haszeldine to critique this document, the NDA responded and then Professor Haszeldine was given a chance to respond to that.
- 6.4 The NDA published a report detailing its approach to managing outstanding scientific and technical issues in August 2011 (13) and a second edition of this report is expected soon. The NDA's register of issues now lists over 900 outstanding issues. (14)
- 6.5 Nuclear Waste Advisory Associates, Greenpeace International and Professor Stuart Haszeldine have clearly raised issues around the huge number of uncertainties associated with deep geological repositories which require answers. The Partnership has, in fact, not spent very much time looking at safety issues. Nuclear Waste Advisory Associates for example, were given just a few hours to present information on a couple of examples of issues from their register of 101 issues. Further independent scrutiny of the work being carried out on the NDA's 900 issues should be carried out.
- 6.6 The Partnership, however, appears to be satisfied with only "suitable regulatory and planning processes" to protect residents, workforce and the environment; and it wants to be satisfied that the NDA has suitable capability and processes in place to protect residents, workforce and the environment. It does not intend to scrutinise in the required detail how the NDA is dealing with the 900 outstanding scientific and technical issues. Whilst the Partnership recognises that the NDA's R&D programme will have to be subject to significant independent ongoing scrutiny by any future partnership, by the regulators and by CoRWM, including the use of expert review and independent specialists, it makes no recommendations about how this should be done.
- 6.7 This attitude will have the effect of, at best, delaying independent review until the decision-making process has gone too far down the road towards site selection to reverse the process, because as time goes on it will become more and more politically difficult to withdraw.
- 6.8 In Sweden, any Non Governmental Organisation above a certain size can apply for funds from the Swedish Waste Fund established by the nuclear industry to monitor and become involved in the final repository project. Receiving money from the funds then requires that they attend consultation meetings. (15) The Swedish NGO Office for Nuclear Waste Review (MiljöorganisationernasKärnavfallsgranskning), MKG, was set up by a coalition of five member environmental organizations in 2004. MKG is participating in the consultation process, but aims to provide a critical voice. There is at present no such UK equivalent.
- 6.9 **It is the NFLA's view that further independent scrutiny work should be carried out before the Cumbrian authorities decide on whether to proceed to the next stage in the process and that any such decisions are delayed until that scrutiny work has been done.**

7. Inventory

- 7.1 It is a matter of concern that the DVD which accompanies this consultation document mentions that 70% of the waste by volume destined for the repository is already at Sellafield. This is put forward as a reason why West Cumbria should accept building of a repository within its borders.
- 7.2 It may be true that 70% of legacy waste is already located at Sellafield, but the Partnership should also allow for the possibility that the repository will also be required to accept spent fuel from proposed new reactors. The NDA's baseline inventory of legacy waste amounts to

631,000m³. So what the DVD is saying is that 441,700m³ is already located at Sellafield. (16)

7.3 The DECC/NDA 2010 Upper Inventory only allows for a 10GW new reactor programme. In this case the total volume of packaged waste rises to 1,160,000m³. Much of the increase will be caused by extending the life of existing reactors. Using NDA's figures it appears that a 16GW new build programme would increase this to 1,221,021 m³. (17)

7.4 So it is misleading to say that 70% of the waste is already at Sellafield. With no life extension and no new reactor programme we could avoid creating around half of the waste currently planned to go into the repository.

7.5 The waste inventory includes different kinds of waste which generate different levels of heat. The more heat that is generated the more space is required to house the waste. So, in fact, volume is not the most important measure to use in the waste inventory, but the amount of space taken up by the packaged waste or the waste "footprint" is more important. 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 capacity, 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.

7.6 **Given that the Government has agreed with the Partnership third Inventory Principle to inform a Community Siting Partnership at the earliest opportunity when significant changes occur to the 'upper' inventory, the Partnership should have pressed DECC to produce an upper inventory which looked at a 16GW new nuclear programme.**

7.7 **The Partnership should have made clear in the consultation materials that, in the event of a 16GW new build programme around half of the waste, by volume, destined for the repository is not yet located in Cumbria.**

8. One repository or two?

8.1 According to a report produced by DECC and the NDA, without a specific site, it is not possible to say using the 2010 Baseline or Upper inventory (which only allows for waste from a 10GW new reactor programme) whether more than one facility might be required. This will be explored through the MRWS process of site selection, through detailed site investigations and through ongoing research and development into disposal concepts.

8.2 It should be noted that the Environment Agency (EA) has set a limit on the risk that may be caused by the burial of radioactive wastes of 10⁻⁶ (i.e. one in a million). (18) However, the NDA Disposability Assessment Report for waste arising from new EPR reactors states:

"...a risk of 5.3 x 10⁻⁷ per year for the lifetime arisings of a fleet of six EPR reactors each generating a lifetime total of 900 canisters is calculated" (19)

8.3 **DECC has said it will discuss emplacing spent fuel from new nuclear reactors in the repository with the host community if the process proceeds – implying that the community would have the option of deciding only to accept legacy wastes. The Partnership needs to ask DECC now what the implications would be if the host community said it would only take legacy waste. The Partnership also needs to ask DECC to address the above point about the risk limit for a single repository.**

8.4 **It is the NFLA view that should the Cumbrian authorities move on to the next stage the momentum in the process will be too great to allow withdrawal in future. Cumbria could, therefore end up not only with disposal facility which takes all the spent fuel from new reactors, but also with more than one dump.**

9. Conclusion

To reiterate, the NFLA does not believe the areas covered by Allerdale and/or Copeland Borough Councils should take part in the search for an appropriate site for a deep-underground nuclear waste repository.

10. Consultation Submission References

- (1) Geological Disposal Facilities on Land for Solid Radioactive Wastes: Guidance on Requirements for Authorisation, Environment Agency, February 2009. Page 47 para 6.3.17
<http://publications.environment-agency.gov.uk/pdf/GEHO0209BPJM-e-e.pdf>
- (2) Managing our Radioactive Waste Safely: CoRWM's recommendations to Government, CoRWM, July 2006. <http://tinyurl.com/7xooy8z>
- (3) Letter to Whitehaven News 2nd Feb 2012 <http://www.whitehavennews.co.uk/letters/you-say/the-nuclear-waste-debate-1.920956?referrerPath=letters/you-say> and responses Whitehaven News 9th Feb 2012 <http://www.whitehavennews.co.uk/letters/you-say/nuclear-waste-the-great-debate-continues-1.923190?referrerPath=home>
- (4) Whitehaven News 23rd Feb 2012 <http://www.whitehavennews.co.uk/letters/you-say/ill-conceived-unworkable-nhs-bill-opens-door-to-privatisation-1.927854?referrerPath=letters>
- (5) Save Our Lake District website, Consent & Planning. <http://mrwsold.org.uk/more-information/consent-planning-2/>
- (6) SOLD Press Release 14th March 2012
<http://mrwsold.org.uk/2012/03/14/disquiet-emerges-in-mrws-partnership/>
- (7) See for example: Why a deep nuclear repository should not be sited in Cumbria, David Smythe 12th April 2011
<http://www.davidsmythe.org/nuclear/Unsuitability%20of%20Cumbria%2012April2011%20plus%20figs.pdf>
- (8) NWAA Issues Register, March 2010. <http://www.nuclearwasteadvisory.co.uk/wp-content/uploads/2011/06/NWAA-ISSUES-REGISTER-COMMENTARY.pdf>
- (9) Rock Solid, Genewatch for Greenpeace International, September 2010,
http://www.westcumbriamrws.org.uk/documents/Rock_Solid.pdf
- (10) 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>
- (11) <http://www.nda.gov.uk/aboutus/geological-disposal/rwmd-work/dssc/main-docs.cfm> &
<http://www.nda.gov.uk/aboutus/geological-disposal/rwmd-work/dssc/index.cfm>
Press Release on publication dated 23rd February 2011 <https://www.nda.gov.uk/news/multi-barrier-approach-key-to-safety.cfm>
- (12) R&D Programme Overview, Research and Development needs in the Preparatory Studies Phase, NDA February 2011 <http://www.nda.gov.uk/documents/upload/Geological-Disposal-Research-and-Development-Programme-Overview-February-2011.pdf>
- (13) RWMD Approach to Issues Management, NDA, August 2011
<http://www.nda.gov.uk/loader.cfm?csModule=security/getfile&pageid=47986>
- (14) 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 issue groups are listed in (13). 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.
- (15) Geological Disposal: Brief Overview of NGO involvement in the radioactive waste management process in eleven overseas countries, NDA, July 2010
<https://www.nda.gov.uk/documents/upload/Geological-Disposal-Brief-overview-of-NGO-involvement-in-radioactive-waste-management-process-in-eleven-overseas-countries-July-2010.pdf>
See MKG website: <http://www.mkg.se/en/the-swedish-ngo-office-for-nuclear-waste-review-mkg>
- (16) The 2010 Estimate of Radioactive Waste for Geological Disposal, DECC & NDA, March 2011
<http://www.nda.gov.uk/documents/upload/Radioactive-Wastes-in-the-UK-The-2010-estimate-of-radioactive-waste-for-Geological-Disposal.pdf>
- (17) See Slide 8 here:
<http://www.nda.gov.uk/documents/loader.cfm?csModule=security/getfile&%20PageID=48680>
- (18) Environment Agency (February 2009) Geological Disposal Facilities on Land for Solid Radioactive Wastes: Guidance on Requirements for Authorisation, page 46 para 6.3.10
<http://publications.environment-agency.gov.uk/pdf/GEHO0209BPJM-e-e.pdf>
- (19) NDA (22nd Jan 2010) Generic Design Assessment: Disposability Assessment for wastes and spent fuel arising from operation of the UK EPR. Part 1 Main Report. para 5.4 page 97.