



**MANAGING RADIOACTIVE WASTE SAFELY: A REVIEW OF THE LESSONS  
LEARNED FROM THE FIRST ATTEMPT AT IMPLEMENTATION AND  
RECOMMENDATIONS FOR A MORE SUCCESSFUL SECOND ATTEMPT**

**Nuclear Waste Advisory Associates  
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**Historical Note**

The issue of how to deal with higher activity nuclear wastes was largely ignored in the early days of the development of nuclear power and its associated industry, nuclear weapons. (1) So eager was the UK to become a nuclear weapons power and so pressing did it ministers feel the need for nuclear weapons for its security in an uncertain post-WW2 world that the resulting radioactive waste mess still haunts us today.

The radioactive waste management 'policy' pursued by the UK and other nuclear power states throughout the 1950s to the 1980s was for sea disposal of both liquid and solid wastes. This cavalier attitude to waste 'management' was stopped in 1983 by environmental campaigners and the political action taken by the London Dumping Convention. Although it is not possible to assess how much – if any – higher activity wastes were dumped at sea during this period, it is likely that some reactor components, if not entire reactors (from submarines, mostly), were dumped at a variety of marine sites off the UK coast, the most notable of which was the 'official dumping site' marked on marine charts 600 miles southwest of Land's End in the Atlantic, and in the Hurd Deep off the Channel Islands.

The statement in the sixth report of the Royal Commission on Environmental Pollution in 1976 (the 'Flowers Report') that there should be no expansion of nuclear power in the UK until the problems of waste management had been solved has hung like a millstone around the neck of successive governments, as their enthusiasm for nuclear power has waned then waxed and as the pressure to satisfy their climate change obligations has increased. As the then New Labour government contemplated the consequences of its brief affair with renewables and toyed with the idea of putting nuclear back on the agenda, it realised that the 'Flowers' issue had to be addressed and decided to appoint a committee to examine the management options for higher activity waste: the Committee on Radioactive Waste Management (CoRWM) was formed in 2003. It succeeded the Radioactive Waste Management Advisory Committee (RWMAC), which had a wider mission to examine all aspects of radioactive wastes, producing many reports between 1978 and 2004 on many different aspects of UK Radioactive Waste management. These reports and supporting documentation are all available from the UK/EU National Archive website (<http://collections.europarchive.org/tna/20080727101330/defra.gov.uk/rwmac/>).

CoRWM reported in 2006. It recommended disposal but this recommendation was heavily qualified. Predictably, the government took the report as its 'get-out-of-jail-free' card in that it saw the report as a definitive answer to Flowers achieved after three years of examination by a committee which included a broad and balanced membership including both nuclear industry experts as well as anti-nuclear campaigners. Equally predictably, government ignored the nuances and caveats in the report- which its authors had clearly advocated should be implemented as an integrated package of recommendations and glossed over the less convenient recommendations. What government wrongly saw in the CoRWM report was a green light for it to pursue its new nuclear build programme.

- (1) Details set out in chapter 2 of *The International Politics of Nuclear Waste*  
Andrew Blowers, David Lowry & Barry D. Solomon, Macmillan Press 1991

### **The genesis of the problems with MRWS**

The process which CoRWM followed was itself criticised at the time. It assumed, for instance, that disposal ‘removed a burden from future generations’ and, hence, this attribute of disposal scored heavily in the multi-attribute decision analysis approach the committee took in determining its recommendations. Some felt that such weight given to a consequence of disposal which is at best questionable and at worst entirely wrong gave rise to a skewing of the process. In addition some felt that scoring disposal in this way tended to over-emphasise reducing the burden of cost, risk and effort on future generations despite the fact that there is no certainty that it will prove effective in doing so.

While these concerns about how CoRWM arrived at its primary recommendation were mostly lost by the unanimity of support for the report as a whole among committee members, those which arose from government’s handling of the report provoked concern among some members themselves, stakeholders and observers. With a year to go before CoRWM reported, government had introduced the idea that new nuclear build feature in a future electricity mix. The then Prime Minister Tony Blair’s statement to the CBI in May 2006 that ‘nuclear was back on the agenda with a vengeance’ subsequently compromised CoRWM’s recommendations, and begged two questions: one would new build spent fuel be disposed of in a national repository which CoRWM had recommended for legacy waste only and, two, more importantly, had the CoRWM process provided an elaborate and convenient means of re-introducing a technology which had hitherto been eschewed by the Government by conveniently ‘removing’ the historical ‘Flowers’ prerequisite.

### **The forgotten recommendations in the CoRWM report**

The CoRWM recommendations were based on the findings of a three year programme of comprehensive public and stakeholder engagement which was conducted through intensive and extensive strands, engaging informed stakeholders as well as members of the public in a process which was unprecedented in its scope and reach. In short, the recommendations were based on what stakeholders and the public were likely to expect when implementing a repository programme.

CoRWM made fifteen recommendations which were interdependent. We highlight here those which, in the opinion of NWAA, have been largely ignored. NWAA contends that the systematic ignoring of the totality of the CoRWM recommendations form the basis of the reduction in confidence in the process as it has been pursued between 2006 and the decision by Cumbria County Council to withdraw from the process in 2013.

**Recommendation 1:** *Within the present state of knowledge, CoRWM considers geological disposal to be the best available approach for the long-term management of all the material categorised as waste in the CoRWM inventory when compared with the risks associated with other methods of management. The aim should be to progress to disposal as soon as practicable, consistent with developing and maintaining public and stakeholder confidence.*

The aspects of this recommendation which give cause for concern result from the government's interpretation:

- We consider that the government interpreted this recommendation as a 'best option' rather than 'the best available approach' when compared to other methods which was the more cautious and deliberate phrase of CoRWM.
- The government ignored the requirement, implicit in the 'current state of knowledge' term, to recognise and convey *publicly* that disposal was and remains far from a proven technology and that;
- The government has ignored the fact that CoRWM recommended a process in which stakeholders and the public had confidence and has manifestly failed to continue the high level of engagement, openness and transparency required to ensure continuance of and a building on that confidence.

**Recommendation 2:** *A robust programme of interim storage must play an integral part in the long-term management strategy. The uncertainties surrounding the implementation of geological disposal, including social and ethical concerns, lead CoRWM to recommend a continued commitment to the safe and secure management of wastes that is robust against the risk of delay or failure in the repository programme.*

*Due regard should be paid to:*

- i. reviewing and ensuring security, particularly against terrorist attacks*
- ii. ensuring the longevity of the stores themselves*
- iii. prompt immobilisation of waste leading to passively safe waste forms*
- iv. minimising the need for repackaging of the wastes*
- v. the implications for transport of wastes.*

The government's disregard for this recommendation underscores its focus on the exclusion of any consideration that disposal could prove to be unimplementable, and that, as far as it is concerned, disposal is the only option on the table. Storage and the provision of facilities for long to perhaps indefinite storage of radioactive waste has been not been tackled in the way intended by CoRWM as an integral and necessary element of long term radioactive waste management, regardless of the progress – or lack of it – towards a GDF. Facilities at Sellafield remain in critical condition, existing spent fuel facilities at operational plants – often inadequate and vulnerable – are still considered 'interim' and are perhaps of greatest concern in respect of vulnerability to terrorism being far more vulnerable than the reactor cores themselves, which are typically contained

within a robust biological shield. Enhanced storage of legacy wastes, and their associated costs, have taken a back seat purely because government sees disposal as an end point for long term waste management, which will eventually - and its promoters believe, inevitably - be achieved at some point in the not-too-distant future to the exclusion of all other possibilities. To bolster this notion, it has adopted the language of certainty and enablement rather than of assessment ('when' rather than 'if') and, in the face of criticism over the lack of demonstrable plans, successive energy ministers have asserted with no justification at all that effective arrangements for new build spent fuel management will exist.

***Recommendation 4: There should be a commitment to an intensified programme of research and development into the long-term safety of geological disposal aimed at reducing uncertainties at generic and site-specific levels, as well as into improved means for storing wastes in the longer term.***

It is true that RWMD has developed a comprehensive programme of research and development into reducing the uncertainties of disposal. Its portfolio of technical and scientific uncertainties (ethical issues are still to be identified) now embraces a reported 900 issues, including 100 identified by NWAA and around which it is discussing with RWMD how their resolution can be managed. However, the process by which these issues are being progressed lacks the sort of accessibility and ability to scrutinise as would be ideal and, moreover, the corollary of the CoRWM recommendation regarding R and D into storage appears to have been ignored altogether.

***Recommendation 5: The commitment to ensuring flexibility in decision making should leave open the possibility that other long-term management options (for example, borehole disposal) could emerge as practical alternatives. Developments in alternative management options should be actively pursued through monitoring of and/or participation in national or international R&D programmes.***

To our knowledge, there has been no particularly active pursuit of alternatives to disposal through monitoring or participation in national or international R and D programmes, although DECC and the NDA do have a watching brief on activities of the Nuclear Energy Agency (of which the UK is not a member) and the International Atomic Energy Agency (of which it is a member).

***Recommendation 6: At the time of inviting host communities to participate in the implementation process, the inventory of material destined for disposal must be clearly defined. Any substantive increase to this inventory (for example creation of waste from a new programme of nuclear power stations, or receipt of waste from overseas) would require an additional step in the negotiation process with host communities to allow them to take a decision to accept or reject any additional waste.***

Associated with this recommendation, CoRWM added the following statement at the end of the section in the report dealing with recommendations:

***CoRWM takes no position on the desirability or otherwise of nuclear new build. We believe that future decisions on new build should be subject to their own assessment process, including consideration of waste. The public assessment process that should apply to any future new build proposals should build on the CoRWM process, and will need to consider a range of issues including the social, political and ethical issues of a deliberate decision to create new nuclear wastes.***

The question of inventory is inextricably tied into the decision of government to interpret CoRWM's recommendation for disposal as a fit and proper solution for new build waste as well as the 500,000 cubic metres of legacy waste which was the sole focus of CoRWM's work. CoRWM disputed this at the time and the strong and unanimous feeling among the committee members was that new build wastes generate their own unique and distinct issues, both ethically and technically, when compared to legacy wastes in that they do not form part of an unavoidable inventory since they are not yet created, and the "high burn-up" of EPR and AP 1000 fuel presents unprecedented technical challenges. In addition, it is only right and proper that potential host communities are told well in advance what their possible volunteer status requires them to accept in terms of material, radiological burden, technical challenges, and the permanent above ground storage facilities to hold the retrieved radioactive waste inventory if its retrieval is required for environmental or safety reasons. Government has avoided this issue and has assumed that communities will accept that 'radioactive waste' is 'radioactive waste' and that the inventory is of a secondary consideration. This is an erroneous assumption.

***Recommendation 9: There should be continuing public and stakeholder engagement, which will be essential to build trust and confidence in the proposed long-term management approach, including siting of facilities.***

CoRWM's engagement programme was extensive and prolonged and managed to generate, as was required by its terms of reference, public and stakeholder confidence in the process. That confidence has haemorrhaged since 2006. There was no programme of public and stakeholder engagement at a national and regional level. At the local level in Cumbria, participation could be claimed to have been quite extensive and the conclusions of the Partnership report well founded. However, decision-making was effectively left to three executives of the three councils which had expressed an interest in participating in the process. The relationship to broader public and stakeholder engagement and involvement through the partnership and decision-making by a small elite of council executives rendered the process weak and remote from 'the community'.. Unless the level of engagement is kept at a perpetually high level, is comprehensively and informatively prosecuted and unless government is prepared to commit the hefty resources required to underpin that level of engagement, a negative outcome is inevitable.

The recommendations which follow recommendation 9 deal primarily with the community and the relationship between the parties involved in the partnership. The most important areas which have not been acknowledged sufficiently since the CoRWM report are those of the definition of 'community', how the 'affected communities' can be

identified, a clear articulation of how community packages could benefit those recipient and affected communities and, most importantly, who makes decisions on behalf of the community and with what evidence of the authority given to those decision makers by members of the community.

Without attention to these basic issues, the framework for the successful introduction and prosecution of a repository programme is unlikely as it creates the impression that the programme is one which can be likened to a sophisticated ‘imposition’ process in which the majority do not have a say and that benefits, should there be any, will accrue to people other than those who will bear the greatest burden of a repository.

What follows is a NWAA ‘optimum’ process for the implementation of a MRWS process which would give the government and its agencies the best chance of implementing the volunteer process in pursuit of its radioactive waste management policy based on disposal.

## **MRWS PHASE 1**

### **a. Re-visiting CoRWM 2006 recommendations**

1. Consult on the detail about how an R&D programme on deep disposal might be carried forward in an open and transparent way.
2. Geological disposal has been emphasised at the expense of moving forward simultaneously on other integral elements of CoRWM1’s recommended programme including the need for robust interim storage. Recent events in Cumbria suggest that the emphasis on achieving disposal as quickly as possible has not been consistent with developing and maintaining public and stakeholder confidence.
3. Clarify that there will be a separate process for new build waste and consult on how that will be implemented.
4. Consult on the detail of a programme of R&D into other management options which could offer an alternative to a DGR, but will also be necessary, firstly while DGR options are being developed and secondly should the DGR option not prove possible.

### **b. The development and implementation of a stakeholder and public engagement programme to:**

5. Plan and agree an open, transparent and inclusive engagement process at public and stakeholder level which has both extensive and intensive elements: this in itself should involve consultation with the public and stakeholders to determine how they would like to be consulted on such an issue.
6. Have the process peer reviewed by professional engagement practitioners and amended as appropriate

7. Carry out a public consultation exercise to ensure that the definition of ‘community’ in the context of radioactive waste disposal is robust and can stand scrutiny. Have the results peer reviewed by an appropriate body of experts.
8. Identify the issues pertaining to ‘potentially affected communities’ as a concept and include conditions such as, for example, radiological risk; impact on house prices; economic benefits.)
9. Consult on options to be presented to volunteer communities to determine and include in the process the means by which it will be demonstrated at every point at which key decisions are made that the community is still in support of the process.
10. Consult on the establishment of some ground rules on community benefit packages – it should be clear from the outset that volunteering will be more about the effort required, cost and time involved in organising a comprehensive and extensive engagement process than about community benefits in terms of the government paying for unrelated infrastructure benefit. On the other hand this needs to be seen as a positive opportunity to develop a decommissioning and legacy waste management industry with associated export opportunities rather than a desperate attempt by an economically depressed area to gain some benefit from taking waste more prosperous areas want to get rid of. There is a distinction to be made between support for community engagement and benefits as compensation for hosting a facility. The aim should be to ensure enhancement of a community’s identity and image i.e. it should be a ‘benefit’ not a detriment.
11. Review of the MRWS process and its positive aspects such as staged process, the right to withdraw, partnership, volunteerism and participation etc, should be strengthened and retained. NWAA emphasises that in its view, the MRWS process is fundamentally sound<sup>1</sup>, based, as it is, on volunteerism, the right to withdraw and community benefits. It was the manner of the programme’s implementation which caused its ‘failure’ (although it is arguable if it did, in fact, fail as Cumbria County Council exercised the voluntary principle by withdrawing.) NWAA recommends a re-statement of the principles and the core elements of the process in line with the interpretation set out above.

NB: NWAA recognises that the issues of ‘right to withdraw’ and ‘community benefits’ are central and vital to the success of MRWS and that any potential host community would understandably welcome guarantees of these considerations being enshrined – possibly in legislation – to ensure that such rights are carried from one parliament to another across the lifetime of the GDF programme.

NWAA would further recommend two additional preliminary steps to the revitalised MRWS programme:

- holding a **conference** to establish the current baseline of understanding of the science and ethics associated with deep geological disposal, similar to the US experience in respect of Yucca Mountain which sought to establish what *is*

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<sup>1</sup> One associate of NWAA disagrees with the statement that the MRWS process is fundamentally sound.



- known, what is *not* known and how long it will take to resolve the unknowns by inviting key researchers to contribute BEFORE re-launching MRWS:
- establish research councils to establish clear **knowledge transfer website/team** where the latest research findings across all issues is made accessible (c.f. uranium tailings at Port Hope in Canada and where the community insisted on funding such a team to help them follow the arguments) firstly to examine matters relating to generic uncertainties and then to focus on a specific geographical site.

#### c. Oversight

12. Establish a new oversight committee which has a wide range of expertise including social science and ethics. This committee should manage a fund to which communities NGOs etc can bid for support to pay for independent expertise. This should include funds that can be allocated to critical voices at a national level and some for use by volunteer communities to employ expertise.

#### d. Waste Issues. Consultation:

13. Determination of the likely inventory communities will be expected to accept: should this include new build waste, then the consequences of that decision in terms of ethical issues, technical issues, revision of repository surface footprint etc are addressed, notwithstanding the recommendation above for a separate process to evaluate the different technical and ethical issues attending the management of a generation of fuel not yet produced.
14. Determination of the 'retrievability issue': this will fundamentally affect the design of the repository and the technical/ethical issues associated with it. It will also avoid the casual and disconcerting practice of changing national policy from disposal to storage – the two are entirely different and send wildly differing signals to potential host communities. By incorporating retrievability into a deep repository is seen by some as a means by which to attempt to achieve both storage and disposal as long term management options when, in principle and in practice, they are entirely different and distinctive options. Their conflation merely serves to confuse and make opaque official intentions.
15. Costs and who bears those costs, developed in a fully comprehensive way not compromised by commercial confidentiality.

#### e. Development of the Scientific Case

16. Continue research on the **generic** uncertainty issues on the RWMD's 'issues list' in an open and transparent way which involves and includes critics, NGOs, nominated representatives of major stakeholder groups and appropriate minority groups in a programme of joint fact finding - i.e. inside the tent, doing the work alongside RWMD experts and others - joint or co-working.
17. Identify those issues which can be addressed or partially addressed before a specific site is identified. The resolution of generic issues should not be delayed

- until a specific site is identified. RWMD should be required to undertake work which attempts to resolve generic issues across both or all reference geologies.
18. The outcomes of this work should be as open as possible to scrutiny by members of the public within and outside the potential host community. Ensure documents emanating from the process are written in stakeholder-friendly language (where possible) and that the language of possibility rather than certainty is used.
  19. Implement a parallel open and transparent, inclusive, process to examine storage options.
  20. It is axiomatic that a process which has the intention of 'isolating' large volumes of hazardous radioactive waste from the biosphere for millennia should firstly achieve the objective of identifying the most appropriate geology for that purpose. Implement a consultation process which looks at the criteria a potential host geology would have to meet. Should it, for example, be based on depth, natural and very low permeability barriers [as proposed in Canada, Germany (Konrad) and USA (WIPP)] or should it rely on backfill and the integrity of the containers as in Scandinavia?
  21. In its implementation report CoRWM 1 proposed that areas unsuitable on scientific or other grounds should be screened out before an invitation to participate is issued. This is one of CoRWM's key proposals which was not implemented. The first step in the process must be to review the existing UK data and identify the most appropriate geological areas of the country.

## **MRWS Phase 2**

22. Issue a list of those regions which have been screened out as unsuitable. Announce that MRWS will require volunteer communities (in a way that is compatible with the definition of community previously decided).
23. If and when an expression of interest is made, it should be determined by the methodology previously decided whether that expression of interest has public and stakeholder confidence and support.