

Reply to the NDA response to MRWS paper 146

Professor Stuart Haszeldine
University of Edinburgh

22 May 2011

Introduction

Prof Stuart Haszeldine authored MRWS paper 146. That is an examination and critique of the NDA publication on research plans and strategy relating to geological disposal. NDA have had an opportunity to respond to that critique (RWMD Technical Note Vines, Smart, Ellis, LL 13897457). This is a reply to the NDA response to MRWS policy paper 146.

Overall

The NDA have responded to the Haszeldine review (MRWS 146), by interpreting and grouping the comments into clusters, and commenting on each cluster. By this technique, the NDA response has attempted to “rebut” each point made by MRWS 146. The sections below discuss each of the NDA comments, using the numbering in their response. Overall, the NDA do not offer any useful new information, and do not provide convincing replies to any points made by MRWS 146. The NDA response and rebuttal has failed to answer the points made by MRWS Paper 146.

Itemised discussion of NDA response and rebuttals

1-4) The NDA accept the positive points concerning the range and scope of the review and also the accessible language used.

5) The NDA state that their report attempts to be comprehensive, but yet state that the issues itemised as research areas in their report do not all need to be completed in the preparatory phase, before detailed site investigations have begun. It is still not possible for a reader to determine which research areas need to be completed and to what standard. The NDA have completely failed to answer this point.

8) A comment was made by MRWS 146, that there is no audit trail to understand how, and by whom, the NDA have arrived at categorisation of their research topics, and how the NDA have arrived at the assessment of the complete list of research in each research topic. This reply by NDA states that these choices were reviewed internally, and by the NDA research advisory panel. This in no way meets the level of external peer review and scrutiny which would be expected of such an important research programme. Consequently the NDA have conceded the point that there is insufficient and open peer review and discussion of their research program.

9) MRWS 146 stated that referencing to original source materials was patchy, and incomplete the NDA review. NDA do not dispute this, but refer a reader to a series of eight additional NDA reports, which are now available on their website. These reports are many tens of pages (up to 150 pages) in length, and so this rather defeats the objective of making an accessible summary review. But the NDA also concede a point made by MRWS 146, that not all relevant documents are available on their website. An offer is made that users can request documents to be provided, however this does require a user to

know that the document exists beforehand, which is not always possible, especially with the extensive and detailed legacy information available from Nirex work, and current and legacy international work. This criticism of document availability has not been fully addressed.

10) MRWS 146 stated that most of the NDA judgements of research priority were “medium”, which did not enable discrimination of priority to be made in any logical way. This very simple classification was surprising considering that NDA claim to have used a matrix of seven different questions to provide multiple strands of additional information. The NDA reply simply states they consider this approach and lack of detail to be helpful to them. Consequently, the lack of prioritisation information critiqued by MRWS 146 has not been answered. The NDA document on research objectives remains not sufficiently useful or informative to anybody outside the NDA.

11) MRWS 146 attempted to analyse and understand the relative importance of the diversity of research topics presented by the NDA. This resulted in some topics appearing to be much more important than others, because they included many categorisations of “high impact”, “large” knowledge gaps, or “high” urgency. In reply, NDA they say that this categorization does not compare equally between topics, and state that their NDA research process can identify when and how to undertake the research effort. This reply clearly demonstrates that the NDA document remains very obscure, as these judgements are incapable of being made by any external reader. The NDA reply indicates that their categorisations cannot be compared from one topic to another, therefore the NDA research review does not communicate any meaningful information on priorities to a reader outside the NDA. This is totally unacceptable.

12) The comparison of NDA priorities with other external stakeholders is 'welcomed' by the NDA. However there is no commitment to act upon any comments received, to try and understand if external commentators have made valid points which will cause a UK research programme led by the NDA, to adapt.

13) MRWS 146 pointed out that the NDA research document has 52 areas of research which need to be resolved before sites can be chosen. This NDA reply appears to contradict that by stating that it is not necessary for all issues to be resolved. Consequently it remains completely unclear how much research, on what, by whom, and by when, is needed before the site selection process can securely proceed. A community asked to host a Repository has no viable information with which to judge the progress of essential research.

14) MRWS 146 stated that no estimations of costs have been made to undertake in the research work identified by the NDA. The reply provides no information, merely stating that the research program is driven by need. This provides no confidence whatsoever that any of these problems can be solved within the budgetary constraints which exist, in the relevant timescale. Implicit in this reply is the conviction that all problems of site selection can be solved by allocating relevant amounts of research money with an unrestricted

budget. The NDA must be unique on earth and having such confidence. A community would be unwise to host a repository with many significant outstanding technical issues remaining unsolved, with no timescale, budget or method for the resolution of issues.

15) MRWS 146 stated that no timescales are given for individual research topics to be completed. This NDA reply appears to state that all work will be completed within 10 years. No evidence is provided to support this assertion. Indeed the NDA have failed to answer why their analysis of each research topic has failed to estimate of the cost and time for it to be completed.

16) MRWS 146 pointed out the benefits of external scrutiny of the NDA research program, and the radioactive waste disposal program in general. MRWS 146 also called for significant additional funding to be allocated to communities, to enable communities to gain a full understanding of NDA proposals, even to the extent of commissioning some independent studies, to augment desk reviews. The NDA agree that external scrutiny is important, but completely fail to provide a funding mechanism to support this. The implication is that communities will remain greatly under resourced and hostage to the views of the NDA as the Developer. That is un-democratic and unacceptable.

17) MRWS 146 recognised the potential for leakage of radioactive gas as a critical safety performance factor, within a few years of a repository being closed. The NDA reply agrees with this problem and also states that the problem is long standing. This is contradictory to the statements made in item 15, where the implication is that all problems can be solved within 10 years, by spending small amounts of research money. There is no credible basis for the NDA to make this statement. Leakage of radioactive gas remains an intractable problem.

18) MRWS 146 stated that computational models of the natural world do not have simple answers on which to build a safety case for a repository. This NDA reply agrees with that, but maintains the fiction that computer models with un-certain outcomes can be used to build and conclude range of numerical values for a safety assessment to be precise.

19). MRWS 146 stated that radioactive waste dissolved in groundwater from the repository will eventually leak into the ocean. This NDA reply agrees with that, but appears to conclude this is not important because that will be potentially thousands of years into the future. The NDA are ignoring the fact that leakage into the ocean is against international law.

20) MRWS 146 stated that European union regulations permit agreement between different states to enable disposal of waste in other countries. The NDA reply that they are not considering such options. That is remarkable, because it may be both cheaper and more secure to purchase storage in other countries rather than the geologically complex UK.

21) MRWS 146 stated that the NDA appears to be undertaking no specific

research on plutonium or MOX disposal. This NDA reply states that a desk study is underway, but agrees that no specific new research on MOX is being undertaken. It is clear that plutonium dissolution and criticality remain poorly understood at present. Consequently, the NDA may need to generate a research program on an entirely new, and globally poorly known, research area of plutonium disposal, which other nations have not undertaken. Such a programme could take many years, or even decades. The realism of this proposition cannot be assessed with the minimal information provided by NDA, and remains an area of very serious doubt.

22) MRWS 146 stated that the heat produced by MOX and plutonium, and particularly by future disposal of spent fuel will be important. This heat causes the rocks to expand, and will lift the land surface, with important implications that many new fractures will be generated and re-opened. This will enable groundwater flow to circulate much more freely than at present, with greatly increased potential for leakage of radioactivity above and around a Repository site. The NDA cites an unpublished report, but agree that even on their best assumptions, heat effects will be very noticeable. NDA completely miss the scientific point that it is not the heat itself that is important, but the physical consequences for the rocks enclosing the Repository. No good reply has been given to this critical problem.

23) MRWS 146 inquired if an underground research laboratory was to be explicitly planned. This NDA reply appears to concede that this very expensive facility may be required. If so, it is truly remarkable that no mention of this underground laboratory as a contingency is included in the NDA research planning strategy document.

24) MRWS 146 stated that legacy information from previous UK site investigations, particularly in West Cumbria, has not been explicitly taken into account. This NDA reply states that previous information is not appropriate. That is quite bizarre, and not a scientific approach appropriate to resolve any problem. At the time of the 1990s Nirex investigations, the west Cumbria site was very well characterized, and became a globally leading knowledge standard. The site remains well known to this day, with important information not just on the local Site, but also on the entire west Cumbria Region. This is a fundamental admission that science based evidence appears to be unimportant to the NDA, if the results are potentially inconvenient. How can the residents of West Cumbria have any confidence in the quality of the NDA work if the inconvenient information is being ignored, and by being unavailable on the NDA website, much of this information is suppressed?

25) MRWS 146 stated that communities involved as potential hosts for a repository site should be able to fund advisory work. This NDA points out that much of NDA research is externally peer reviewed, but does not concede any need for independent work. That peer review is, of course, to be welcomed. However that does not answer the point of the question, which is that all of this research work is highly technical and complex. Communities asked to receive these developments need to have the technical work synthesised, and interpreted, and explained, in terms which are understandable. In point (16) of

this document, the NDA agreed that external scrutiny is valuable. However it seems that there is no commitment by NDA to fund such work, so that communities may be systematically disenfranchised. That is a power unbalance.

26) MRWS 146 commented that the west Cumbria region does not appear to coincide with international norms for developing radioactive waste disposal sites, which are in flat lying topographic areas, of simple, un-faulted, geology. The NDA reply state that this novel complex and had-to-predict UK geology, already known to be subject to large flows of groundwater, is not a problem. This does not inspire confidence for a community being asked to pioneer an entirely new type of radioactive waste storage site, with only a vague outline of research priorities, with an unspecified budget, and no timescale for completion.

Conclusion

The NDA response to MRWS 146 provides no significant new information, and fails to answer all material points made in MRWS 146. This NDA document does not provide an external reader with a clear explanation of the NDA research priorities, the timescale and budgets for issues to be resolved. The NDA does not provide confidence that several extremely important Repository performance problems known for many tens of years, can be resolved. The NDA concede that a new and globally unique programme of work on MOX and plutonium disposal may be needed.

END