# A Wasted Future:

# how the UK's nuclear waste programme melted down

**Dr David Lowry**

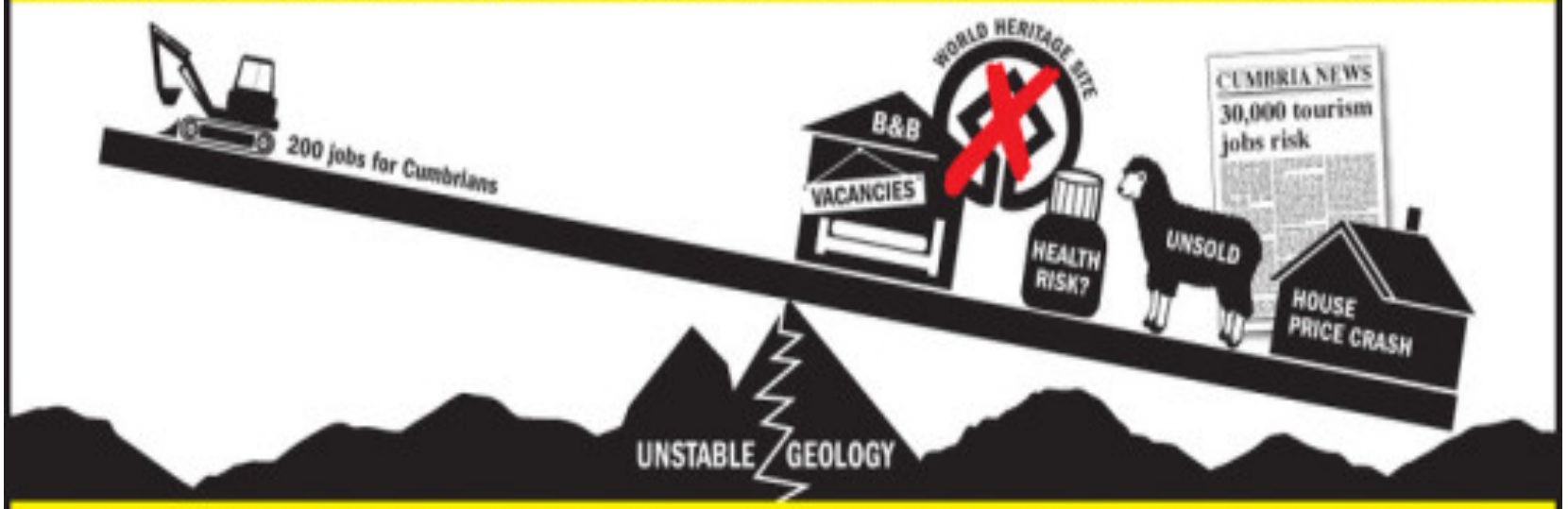
**Nuclear Waste Advisory Associates & Member of the UK Energy Minister's Geological Disposal Implementation Board**

**Presentation to MKG (Swedish NGO Office for Nuclear Waste Review (Miljöorganisationernas kärnavfallsgranskning) forum**

**Stockholm, 21 November 2013**

Ennerdale Water in the Lake District national park

# LAKES NUCLEAR DUMP: IT'S IN THE BALANCE




# DON'T STAY SILENT - DON'T LET THEM DO IT

**Despite the warnings of eminent geologists, your Councillors might vote for a plan to find a place in Cumbria to bury high-level nuclear waste. Experts say that it could eventually bring jobs for 200 Cumbrians. The risks to our health, landscape, tourism, farming and property value far outweigh that.**

**It is vital that these Councillors know your opinion.**

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**www.nolakesnukedump.com**


NO

# Ditch the Nuke Dump! Demo -19th Jan at Bowness Bay


SPAND
www.spand.org.uk
NO
TO DUMP

Roger Parker from Lamplugh delivers a 11,000-signature internet petition to the Copeland Council offices from the No Ennerdale Dump Campaign


Nuclear Dump in Cumbria
16,000 say no to nuclear dump in Cumbria
People Power Change
No Nuclear Dump in Cumbria
NO NUCLEAR DUM
IN CUMBRIA
38 DEGREES


85%
PARISH COUNCILS EXPRESSING VIEW
SAY NO


HELP


NO


NO
5000+
SAY NO TO
NUKE DUMP


MRWS
STOP
STAGE 4
Copeland Borough
Council
tion/Enquiries
MRWS
STOP
STAGE 4

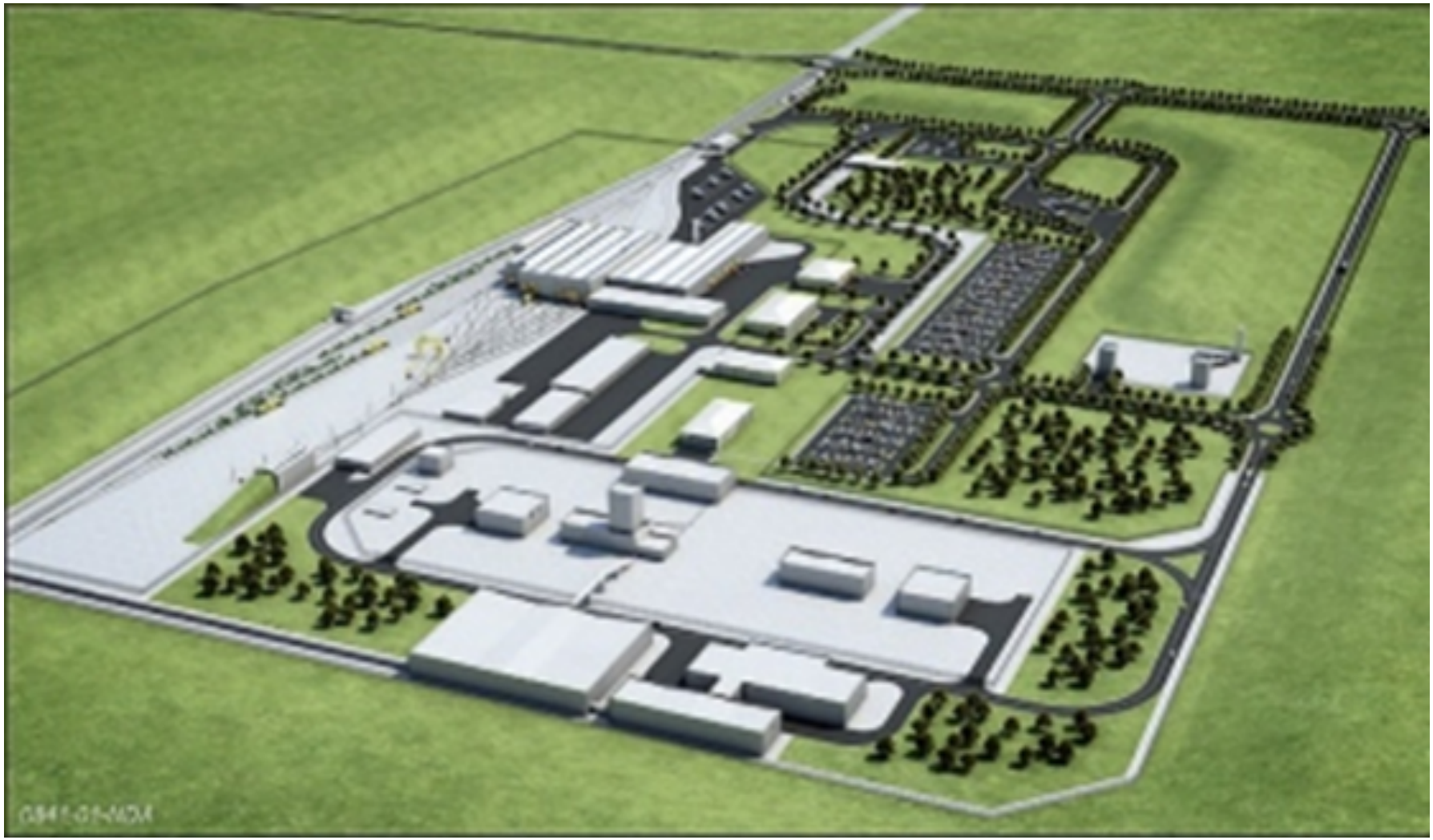

DON'T
BURY
NUCLEAR
WASTE
NO
NUKILLER
DUMP
Nukil
Dum
Don't go into Mr McGregors Garden!
Beatrix Potter
Like lemmings... We are oblivious
Wordsworth

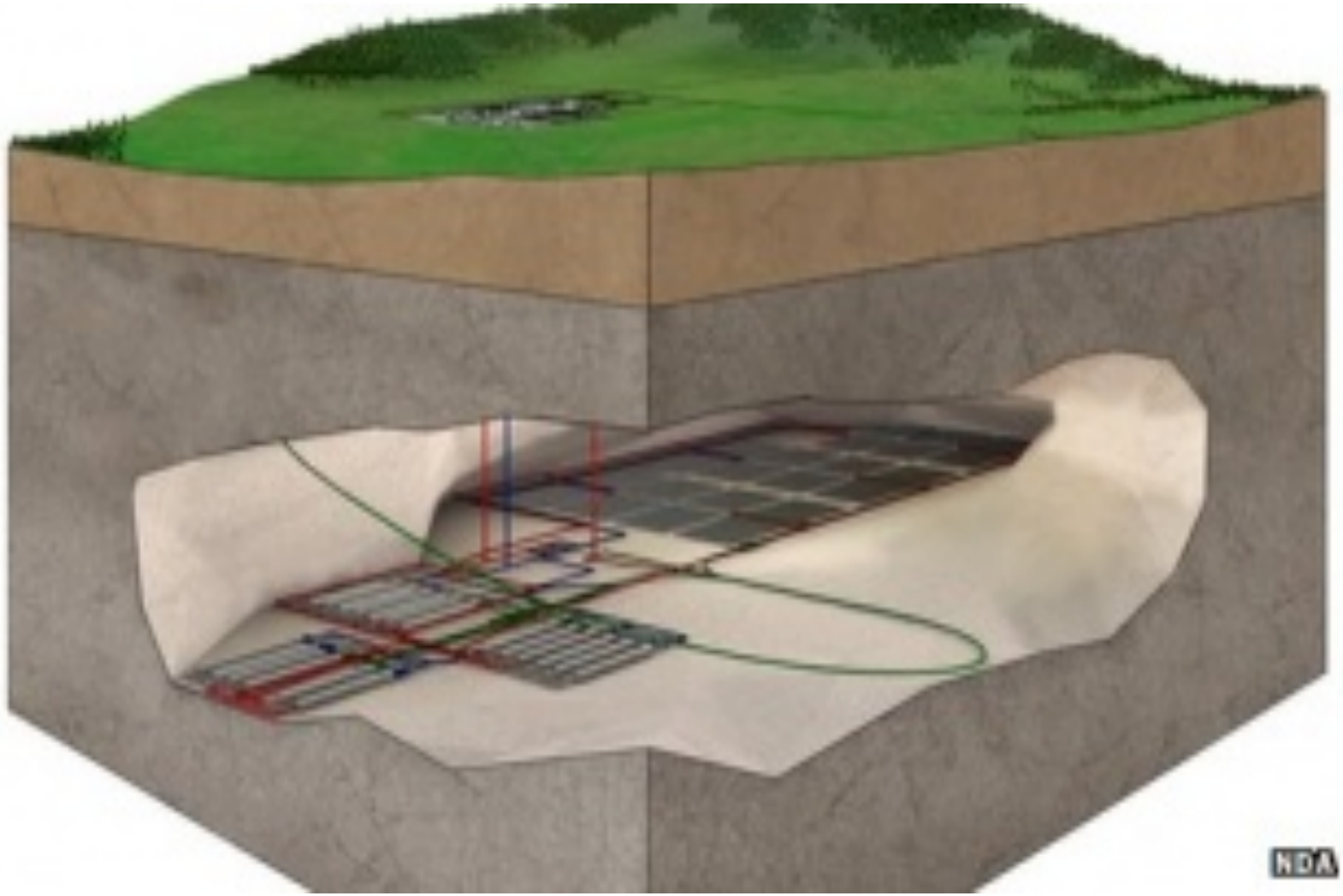

RESEARCH ASSE II
RADIATION EMISSION FROM
YEARS

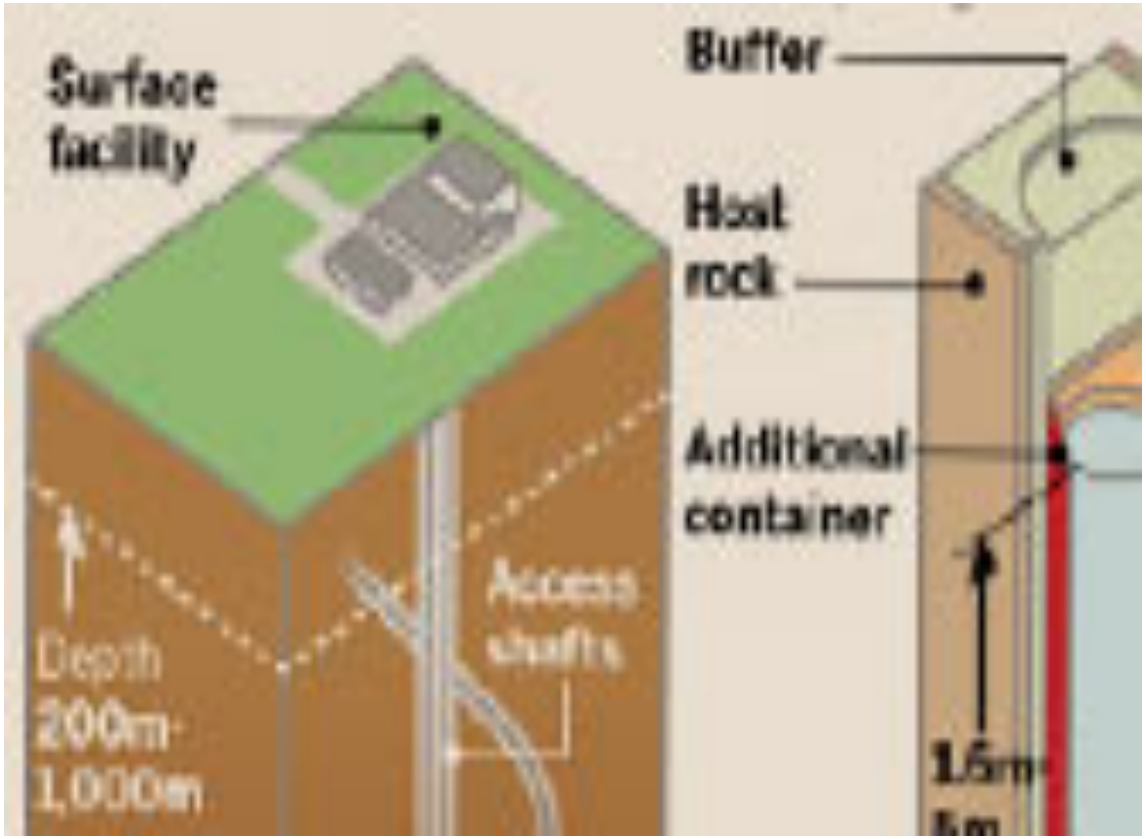

NUCLEAR
WASTE -
Is this what you want
under the rainbow?

**Cumbrian Times & Star, Wednesday, 30 January 2013**
http://www.timesandstar.co.uk

# Cumbria County Council has said **NO** to proceeding with a search-7 votes to 3




NDA


Surface facility
Buffer
Host rock
Additional container
Access shafts
Depth 200m-1,000m
1.5m
5m


Consultation
Review of the Siting Process for a Geological Disposal Facility

## Role and position of Cumbria Trust

Cumbria Trust's aims are  in short are to:-

**1. Campaign against any geological disposal facility (GDF) anywhere in Cumbria on geological, environmental and safety grounds.**

**2. Campaign against DECC's proposed exclusion of Cumbria County Council from the process and exclusion of Parish and Town Councils.**

**3. Respond to the current DECC consultation and encourage others to do the same.**

**4. Campaign for safer, longer term storage of nuclear waste currently at Sellafield and other UK nuclear licensed sites.**

**5. As part of the ongoing Sellafield decommissioning (circa £1.6billion per annum being spent); campaign for greater spend and investment in West Cumbria as part of this process and also for greater diversification of the local economy.**

**6. Campaign to preserve the integrity of the Lake District National Park, Solway AONBs and other environmentally sensitive sites and also the  "Lake District" brand.**

**7. If needs be, to challenge legally the policy outcomes and decisions of DECC and local authorities.**

**Baroness Verma on a visit to West Cumbria last year, with Coun Tony Markley and Coun Alan Smith from Allerdale, Coun Tim Knowles from Cumbria County Council and Coun Elaine Woodburn from Copeland**

Radioactive waste stored in a pool at Sellafield

# IoS Investigation: Officials plotted Sellafield cover-up

MPs were denied the chance to challenge sweetener to private firm's nuclear deal

By Geoffrey Lean , Andy Rowell and Rich Cookson

Sunday 04 January 2009

http://www.independent.co.uk/news/uk/politics/ios-investigation-officials-plotted-sellafield-coverup-1224473.html

Top civil servants and nuclear administrators colluded to prevent MPs from challenging a massive sweetener to a private business taking over the running of Sellafield, internal documents in the hands of *The Independent on Sunday* reveal.

The documents, obtained through the Freedom of Information Act, also disclose that the Government pushed through the handover at breakneck speed because it feared that the "unstable management arrangements" of the controversial Cumbrian nuclear complex risked its safety.

KPMG

# The PBO model at Sellafield: Performance to 31st May 2013

11th September 2013

FINAL REPORT - PROTECT

"NMP approach to the governance of SL (Sellafield Ltd) does not appear to have been effective"

- KPMG

**“Since the start of the SSEP (Sellafield Security Enhancement Programme) an average of 11.5 security events have been reported per calendar month.” -KPMG**

**Physical progress with LP&S (legacy ponds & silos)**
**Key findings (2/3)**

ISSUE: Headline

■ Major projects estimated total lifetime costs have increased by £1,214 million in total since PP11, equating to 37% cost variance

“NDA is unable to define its requirements for Sellafield in sufficient detail to be able to effectively contract and hold a contractor to account for performance. This is largely due to the continued uncertainty of the task at Sellafield, although also reflects a lack of detailed understanding of the site within NDA.”

**“Conversations with project managers indicate that some lack detailed understanding of the projects that they are managing. This is in part due to the complexity of reporting and volume of data received from Sellafield Ltd**


TIGGYWINKLE'S
LAUNDRY

# Nuclear disposal put in doubt by recovered Swedish warship

**The plan to use copper for sealing nuclear waste underground has being thrown into disarray by corrosion in artefacts from the Vasa**

- By **Terry Macalister**
- **The Observer, Sunday 15 November 2009**

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Plans for nuclear waste disposal could be thrown into confusion tomorrow at a summit because of new evidence of corrosion in materials traditionally used for burial procedures.

The Nuclear Decommissioning Authority (NDA) says it will keep careful watch on a meeting organised by the Swedish National Council for Nuclear Waste, which will look at potential problems with copper, designated for an important role in sealing radioactive waste underground.

Concerns have risen from a most unexpected quarter. Examination of copper artefacts from the Vasa, a seventeenth-century galleon raised from Stockholm harbour,(having sunk immediately after its inaugural launch in 1628) has shown a level of decay that challenges the scientific wisdom that copper corrodes only when exposed to oxygen.

Dr David Lowry, a consultant on the nuclear industry, said the latest evidence had profound implications. "As the British nuclear industry gears up to build a new generation of nuclear reactors, so the pressure builds to demonstrate there is a solution to the long-term management of nuclear waste. But plans to adopt the Swedish system of nuclear waste disposal look as if they might have hit the rocks."

The NDA said that no decision had been taken on what materials would be used for containment. "It's not a showstopper. There are other options," a spokesman said. Researchers from the Royal Institute of Technology (KTH) in Stockholm have prepared a report for tomorrow's meeting which says its findings "cast additional doubt on copper for nuclear waste containment and other important applications."

http://www.theguardian.com/environment/2009/nov/14/copper-nuclear-containment-vasa-sweden

# Copper canister: The KBS-3 concept

**The SKB report says the following on the applicability of the KBS-3 technology in the UK**

"The applicability of the KBS-3 technology to the UK was assessed based on expert judgement. About 25 interviews were made with SKB's most experienced experts. The applicability of each of the eight technology areas was analysed for three generic geological settings and the types of waste in the UK inventory. Technology area 3 Repository was analysed in more detail, in terms of its eight component parts, due to the importance and amount of technology associated with this area. The outcome of the interviews was documented and reviewed by an expert panel of senior SKB staff members.

The results are presented as percentage figures, to indicate to what level the technology is judged to be applicable to the UK programme. The figures are based on expert judgement and are not derived from a specific formula. The basis for the percentage figure is the proportion of the total work completed by SKB for the Swedish programme that is applicable to the UK situation.

The analysis indicates that the KBS-3 technology would be 80–90% applicable to the needs of the UK programme for disposal of SNF and high-level waste (HLW) at a site with higher strength host rock. There is a high applicability for the canister, the encapsulation, the repository design and the assessment of long term safety. The technology would also be applicable to a similar level to UK stocks of plutonium and highly enriched uranium if immobilised as a ceramic. The parts that are not applicable are related mainly to differences in site investigations, RD&D needs and safety assessment of disposal of HLW and certain fuels specific to the UK."

**UK needs not covered by the KBS-3 technology**

There are inevitably areas and needs of the UK programme that will be covered only partly or not
at all by a transfer of the KBS-3 technology. There will be a need for adaptation and closing of
identified gaps, which will require a work programme, including RD&D in a number of areas. NDA
RWMD is best placed to determine this need but the study discusses briefly a number of areas where the applicability of the KBS-3 technology is considered to be lower

- Deep geological disposal of low-level and intermediate-level radioactive waste.
- Site characterisation technology in a geological setting other than higher strength rocks.
- Disposal in a geological setting other than higher strength rocks.
- Co-location of radioactive wastes.
- Meeting specific UK regulatory requirements and permit regimes.

“No definitive design has been proposed by ONR's Decommissioning, Fuel and Waste (DFW) programme. When it does, if copper is the material that is proposed then we would expect that choice to be justified in the safety case taking into account all available evidence including the recent evidence that you are citing. At that time ONR will then decide whether an adequate safety case has been made. Copper is the most commonly proposed material worldwide for this use but we are also aware of both titanium and stainless steel clad mild steel containers being considered as well.”

**- Steve Newman, director, Strategy and assurance, ONR, 5 June 2013**

“Within its generic design RWMD for illustrative purposes gave an example of a "multi barrier system" for containing the waste. Copper was one of the materials chosen for the illustration (two other examples were also shown which did not use copper). At this stage ONR would not provide a definitive view on the suitability of copper but it did raise a few issues to be addressed relating to the possibility of galvanic corrosion and creep. ONR has not provided any definitive views on copper's suitability and we would not do so until, firstly, we had the legal vires, and, secondly, RWMD had selected its chosen option and presented a far more detailed safety case than anything we have received so far”.

**Steve Newman, ONR, 9 September 2013**