Scotland’s Higher Activity Radioactive Waste Policy

Strategic Environmental Assessment

Annex to the Environmental Report:
Supplementary Assessment of Policy Alternatives
Scotland’s Higher Activity Radioactive Waste Policy

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Annex to the Environmental Report: Supplementary Assessment of Policy Alternatives

In January 2010, the Scottish Government published a draft Detailed Statement of Policy for Higher Activity Radioactive Waste for public consultation. A Strategic Environmental Assessment (SEA) of the Draft Policy was undertaken and an Environmental Report was published for consultation in accordance with the Environmental Assessment (Scotland) Act 2005 (‘the 2005 Act).

The initial consultation period on the Policy has now closed, but the relevant documents can still be viewed online as follows:

- The draft Policy is set out in the Consultation Document, which can be viewed at www.scotland.gov.uk/HAW-ConDoc
- The Supplementary Information can be found at www.scotland.gov.uk/HAW-Sup
- The SEA Environmental Report that was published alongside the Draft Policy and can be found at www.scotland.gov.uk/HAW-ER

The Scottish Government has undertaken further environmental assessment work. The attached supplementary assessment forms an Annex to the Environmental Report and should therefore be read in conjunction with the previously published information.

Further public views on this supplementary assessment are invited by 21 October 2010.

Please send your response, including the Respondent Information Form to:

Radioactivewasteteam@scotland.gsi.gov.uk
Or
Scotland's Higher Activity Radioactive Waste Consultation
The Scottish Government
Environmental Quality Division
1-J Dockside
Victoria Quay
Edinburgh
EH6 6QQ

If you require further clarification please contact us on the email address above or telephone 0131 244 0199
The Scottish Government has an email alert system for consultations, http://register.scotland.gov.uk. This system allows stakeholder individuals and organisations to register and receive a weekly email containing details of all new consultations (including web links). It complements, but in no way replaces SG distribution lists, and is designed to allow stakeholders to keep up to date with all SG consultation activity, and therefore be alerted at the earliest opportunity to those of most interest. We would encourage you to register.

Handling your response

We need to know how you wish your response to be handled and, in particular, whether you are happy for your response to be made public. Please complete and return the Respondent Information Form as this will ensure that we treat your response appropriately. If you ask for your response not to be published we will regard it as confidential, and we will treat it accordingly. All respondents should be aware that the Scottish Government are subject to the provisions of the Freedom of Information (Scotland) Act 2002 and would therefore have to consider any request made to it under the Act for information relating to responses made to this consultation exercise.

Next steps in the process

Where respondents have given permission for their response to be made public and after we have checked that they contain no potentially defamatory material, responses will be made available to the public in the Scottish Government Library (see the attached Respondent Information Form). You can make arrangements to view responses by contacting the SG Library on 0131 244 4552. Responses can be copied and sent to you, but a charge may be made for this service.

Comments

If you have any comments about how this consultation exercise has been conducted, please send them to the contact details above.
Scotland’s Higher Activity Radioactive Waste Policy
Annex to the SEA Environmental Report: Supplementary Assessment of Policy Alternatives

RESPONDENT INFORMATION FORM
Please Note this form must be returned with your response to ensure that we handle your response appropriately

1. Name/Organisation
Organisation Name

Title  Mr  Ms  Mrs  Miss  Dr  Please tick as appropriate
Surname
Forename

2. Postal Address

Postcode  Phone  Email

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<td>(d) We will share your response internally with other Scottish Government policy teams who may be addressing the issues you discuss. They may wish to contact you again in the future, but we require your permission to do so.</td>
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Scotland’s Higher Activity Radioactive Waste Policy

Annex to the Strategic Environmental Assessment (SEA) Environmental Report: Supplementary Assessment of Policy Alternatives

1.0 Introduction

1.1 In January 2010, the Scottish Government published a draft Detailed Statement of Policy for Higher Activity Radioactive Waste for public consultation. A Strategic Environmental Assessment (SEA) of the draft Policy was undertaken and an Environmental Report was published for consultation in accordance with the Environmental Assessment (Scotland) Act 2005 (‘the 2005 Act’).

1.2 Several respondents asked for greater detail on deep geological disposal. This included the Committee on Radioactive Waste Management (CoRWM), who stated that a fuller comparison of the draft Policy with this option would increase public confidence in the proposed approach.

1.3 Whilst the Scottish Government position remains that it does not consider deep geological disposal to be a “reasonable alternative” at this time it recognises that others may be of the view that it is “reasonable”. In light of this, and acknowledging the need to fulfil the requirements of the 2005 Act by identifying the significant environmental effects of alternatives to the Policy, which others may consider to be reasonable, the Scottish Government is publishing, and inviting views on, this supplementary assessment.

1.4 In order to make best use of available information, reference has been made to the work of other organisations, specifically the recent Sustainability Appraisal of its Strategy for the Management of Low Level Waste (LLW) undertaken by the Nuclear Decommissioning Authority (NDA). These secondary sources are fully referenced below.

2.0 Potential significant environmental effects of deep geological disposal

2.1 The findings of the assessment are largely uncertain at this point in time. All options for radioactive waste storage and disposal have the potential to generate positive or negative environmental effects. However, any of these effects are likely to be very long term and therefore are difficult to fully predict and, compounding this, views on risk are largely subjective.

2.2 Where the environmental effects of any facility are more localised (e.g. effects on areas arising from construction), they remain generally uncertain in the absence of further locational decisions. This is particularly relevant to some environmental issues including biodiversity, landscape and cultural heritage. Other effects can reasonably be expected to be negligible or neutral, taking into account existing regulatory regimes. This is the case for effects arising from issues such as long term leakage and pollution affecting water and soil.

2.3 The inventory of current wastes shows that the majority, by volume, of Intermediate Level Waste (ILW) in Scotland is made up of graphite and contaminated or activated metals. Views on opportunities for storage and disposal of graphite, the most significant part of the total volume of waste in Scotland, are varied and therefore their impacts also uncertain. The International Atomic Energy Agency (IAEA) notes that the depths at which ILW should be disposed of will depend on the specific facility and its associated safety case.
**Population and human health**

2.4 Risks to the general population arising from exposure to radionuclides would not be significant from a deep geological disposal facility, as long as applicable regulatory regimes are followed. However, views on cumulative risk and actual emissions are varied and uncertain at this stage, and it is acknowledged that this is a key concern amongst consultees. Any facility would require much more detailed and specific modelling and assessment at the project level.

2.5 Dispersal of contaminants from disposal sites would take place, but this would occur over a very long time-span (see geology, soil and groundwater below). Again, this would be limited by regulatory standards and it has been argued that it could be reduced by the siting of a facility in appropriately impermeable geology and more generally by linking the reducing level of activity with the design of the facility and the process of barrier degradation. Within a deep geological disposal facility, monitoring of the dispersal of contamination would be difficult, and remediation measures are likely to be complex and costly.

2.6 Disposal is defined as emplacement without intent to retrieve and multiple barriers would be established to contain the waste within such a facility. Geological disposal does not preclude retrieval but the level of difficulty, activities required and their associated environmental effects could be significant.

2.7 Much of the support for deep geological disposal facilities stems from views on their relative invulnerability to attack and consequent safety. In addition, it has been argued that disposal deep underground reduces the need for very long term management, and the responsibility this infers on future generations.

**Biodiversity, Landscape and Cultural Heritage**

2.8 The effects of facilities on this group of environmental receptors remain unknown at this stage as they are largely dependent on the specific siting, scale and design of any specific facility. It is possible that a deep geological disposal facility could have minimised effects at a local scale on these receptors as result of its likely limited surface area but this cannot be fully defined at this stage. This would only become more apparent, together with the relevant environmental effects, at a later stage in the planning and delivery process.

**Climatic Factors**

2.9 A deep geological disposal facility will consume energy during construction and this could in turn contribute to climate change related emissions. Some of the wastes would also generate greenhouse gases as they break down for example, methane from graphite. Further research on this would be required to take into account the specific wastes involved.

2.10 In terms of climate change adaptation, it can be assumed to an extent that a deep geological disposal facility would be engineered and positioned to take into account long term climate change impacts. In addition, climate change impacts on the waste following closure of any facility could be limited given the depth at which they would be placed. However, it is also important to recognise that the likely siting requirements and difficulty associated with retrieving the waste have the potential to limit flexibility and associated adaptation opportunities.

**Air Quality**

2.11 No significant impacts on air quality are likely to arise from a deep geological disposal facility. As noted above, emissions during operation of any radioactive waste facility (i.e. radionuclides) would be strictly regulated. Mitigation would be available for incidental issues
such as dust and transport emissions during the construction phase at the project level. Whilst the requirements for engineering associated with deep geological disposal could generate significant but temporary effects at a local scale during construction and closure, these cannot be fully defined at this stage.

**Geology, Soil and Groundwater**

2.12 As a deep geological disposal facility would be required to demonstrate regulatory compliance in relation to exposure to radionuclides and other contaminants prior to its approval, the effects on these receptors are not expected to be significant. Potential for soil and groundwater to be affected by leachate could be greater from a deep geological disposal facility as it is likely to be designed to allow for dispersal of mobile radionuclides over the very long term (over thousands, rather than hundreds of years), within regulatory standards.

2.13 A deep geological disposal facility would require considerable backfilling to facilitate sealing and closure. Past experience suggests that some 1 million tonnes of crushed rock, 60 tonnes of reinforcement for permanent plugs, and nearly 30,000m³ of cement for plugs would be required in a typical facility. Given the timescales involved it is unlikely that extracted materials could be effectively stored nearby and reused.

**Material Assets: Waste**

2.14 As noted previously, options for the treatment of graphite are currently being explored by the NDA. The actual performance of the facilities will also depend on the extent to which treatment influences the volume of the wastes, and cannot be fully defined at this stage. The SEA Environmental Report recommended that treatment which reduces volume is undertaken where feasible.

**Material Assets: Transport Infrastructure**

2.15 As a deep geological disposal facility is likely to be taken forward at a single location, this would generate transport miles required to move wastes from more than one of the sites in Scotland where waste is located. This implicit distancing effect would generate cumulative transportation impacts arising from the use of such a facility.

2.16 However, direct effects from transportation of waste should not be significant, when regulatory requirements and the scale of overall freight movements are considered. No significant transportation related safety issues are expected, taking into account past track records in transportation safety.

### 3.0 Conclusion

3.1 This analysis suggests that there are a number of significant environmental challenges associated with deep geological disposal, and therefore possible benefits arising from the draft Policy which favours near surface storage or disposal. It is also important to note that, taking into account the findings set out in the Environmental Report for the draft Policy, all options for radioactive waste management have benefits and disadvantages when viewed from a purely environmental perspective.

3.2 The Scottish Government position remains that it is does not support deep geological disposal of radioactive waste and does not consider it to be a ‘reasonable’ alternative at this point in time. The Scottish Government Policy is that the long-term management of higher activity radioactive waste should be in near surface facilities.
4.0 Next Steps

4.1 Consultee views on this supplementary assessment are now welcome. Consultees are asked to avoid restating their views on the consultation on the draft Detailed Statement of Policy, as these are already being taken into account, but to focus on the information set out here. Consultee views will be taken into account as the Policy is finalised.

4.2 Written (by post or email) responses should be provided by 21 October 2010. Please send your response, including the Respondent Information Form to:


Radioactivewasteteam@scotland.gsi.gov.uk

References


iii http://www.scotland.gov.uk/Publications/2010/01/14151345/7


v Health and Safety Executive, Environment Agency and SEPA (2010) Management of Higher-Activity Waste on Nuclear Licensed Sites, Revised Version. http://www.hse.gov.uk/nuclear/wastemanage.htm#3b Part 3b requires that the waste is treated safely and appropriately and disposed of at an appropriate time in appropriate ways. Disposability must be demonstrated by the licensee and this is subjected to auditing.


x The Near Surface GRA (referred to previously also takes into account chemical toxicity and biological hazards, requiring an environmental safety case to be made to demonstrate protection of the environment and people.


