

# Low Level Waste Repository

## Our review of the Environmental Safety Case

April 2013

### Foreword

This is the third of a series of progress reports on the Environment Agency's review of the Low Level Waste Repository's Environmental Safety Case, leading up to our review of the site's Environmental Permit and a decision on granting a revised Environmental Permit for on-going disposals at the site.

### Introduction

The Low Level Waste Repository near Drigg (LLWR) is used for the disposal, by burial, of low level radioactive waste (LLW). In May 2011 the operators of the site, LLW Repository Ltd, submitted an updated Environmental Safety Case (ESC) to the Environment Agency, as required under their Environmental Permit.

We are now nearing the end of our technical review of this ESC and aim to publish our conclusions around autumn 2013<sup>1</sup>. LLW Repository Ltd has informed us they intend to apply to us around summer 2013<sup>1</sup> to vary their Environmental Permit to allow continued disposal of LLW at the site. We will review this application when received and will consult with others. The application will be supported and informed by the ESC and our technical review of it.

This review process is taking longer than originally anticipated, as the review has identified additional assessment work to be carried out by LLW Repository Ltd and assessed by the Environment Agency. We are taking the time necessary to complete a thorough review of the submitted ESC.

<sup>1</sup> These timescales are estimates and depend upon receipt of additional information requested to support the ESC and our review of that information, in addition to LLW Repository Ltd's progress towards submission of a variation application.

### The Importance of this review

Low Level Waste (LLW) is generated by the nuclear industry and also by non-nuclear sources such as hospitals. LLW is typically made up of contaminated operational wastes such as protective clothing, paper, metals, rubble and soil.



Typical LLW before compaction

The LLWR is one of the facilities in the UK able to dispose of LLW and is the only UK site currently designed to take nearly all types of LLW. As the environmental regulator, the Environment Agency work with the nuclear industry to ensure that they minimise the amount of LLW requiring disposal by reducing, reusing and recycling as much as possible.

When the last ESC was submitted in 2002 we found it to be incomplete. As a result, we were only able to authorise disposal of LLW into the vault that was in use at the time. This vault (Vault 8) is now full and LLW Repository Ltd has informed us they will ask for a varied permit to dispose of LLW in other vaults. The Environment Agency will only authorise further disposals if we are satisfied that disposal of LLW will be safe for people and the environment both now and in the longer term. LLW Repository Ltd has set out to demonstrate this in their updated ESC.

## Environmental Safety Case review process

Our key reference point for this review is a document known as the Guidance on Requirements for Authorisation (GRA)<sup>2</sup>. This explains the requirements that we expect the operators to fulfil before we grant a permit to dispose of waste. The GRA sets out our radiological protection requirements and explains our regulatory process that leads to a decision. It also explains the required contents of the ESC that we expect an operator to produce.

The guidance details five principles for radioactive waste disposal and fourteen more specific requirements which, if fulfilled proportionately to the hazard presented by the waste should ensure that the principles are properly applied. The five principles are:

1. Protection against radiological hazards
2. Optimisation (radiological risks are as low as reasonably achievable)
3. Protection against non-radiological hazards
4. No unreasonable reliance on human action to protect the public and environment at the time of disposal and in the future
5. Openness and inclusivity

We have now nearly completed our technical review of the ESC against the requirements in the GRA and are focussing on the outcomes of the assessment presented by LLW Repository Ltd.

Overall, the Environment Agency believe the ESC represents a reasonable assessment of the impacts of past and proposed future waste disposals at the site, which on the whole is consistent with the assessment criteria laid out in the GRA. However, the Environment Agency has had to seek further information in a number of areas to support our review and to provide what we believe to be a complete ESC. We have received satisfactory responses to many of these requests, although some remain outstanding at this time.

We cannot conclude our review until we have seen and are satisfied with these further responses and

<sup>2</sup> Near Surface Disposal Facilities on Land for Solid Radioactive Wastes. Guidance on Requirements for Authorisation. February 2009. Northern Ireland Environment Agency, Scottish Environment Protection Agency, Environment Agency.

are working with LLW Repository Ltd to gain the evidence we require.

At this stage of the review, we are starting to look forward to future developments in understanding the site. This is required whether or not further disposals are permitted as past disposals are already in place at the site. Technical and site understanding evolves and develops over time and we expect the ESC to do the same. We look for continuous improvement. We therefore asked LLW Repository Ltd to propose a comprehensive forward programme of work and we are reviewing their proposals. Additionally, we will raise 'Forward Issues' where necessary to identify to LLW Repository Ltd areas where we believe the ESC could be enhanced or developed further in the medium to long term.

The Environment Agency is also focussing on any implications for future waste disposals and specifically waste acceptance criteria (WAC) which may be appropriate if waste can continue to be disposed of at the site. These WAC address issues such as the amount of radioactivity that can be disposed, the physical form of the waste and how it must be packaged. We are working with LLW Repository Ltd to ensure any WAC are justified and clearly presented.

Over the next few months we will be starting to document our technical review findings in a series of reports. We will publish these when complete and these reports will support the second phase of our permit consultation process, on our draft decision (see below for more information on the consultation phases).

## Technical issues

Central to our technical review is evidence provided by LLW Repository Ltd in the ESC that indicates the site is very likely to be subject to coastal erosion after a period of several hundred, to thousands of years in the future.

We have examined the evidence behind this carefully and agree with this conclusion. We also accept many aspects of LLW Repository Ltd's assessment stating that coastal erosion does not present unacceptable risks to people or the environment in the future. However, we have raised some specific questions around this assessment through our issue resolution process, in particular with regards to longer lived higher

activity particles, items and sources and are assessing LLW Repository Ltd's responses.

Whilst our assessment of the ESC must be based upon scientific evidence and measured against assessment criteria within the GRA, we also recognise that the risk of coastal erosion in the future may be of concern to many people. For this reason, in addition to working towards a technical conclusion on the acceptability of possible future erosion of the site, we are liaising with other relevant regulatory and government bodies to ensure they are aware of the ESC findings and our assessment of it.

Through our technical review of the ESC, we have raised around 70 'issues' through our issues resolution process. These issues have ranged from simple queries or clarification, to more significant requests for further work. To date many of these issues have been responded to, with only some remaining outstanding. We are currently reviewing and reaching conclusions on these responses. Some of the key issues we are considering are discussed further below.



**Photograph of the northern end of the LLWR taken from the north east, courtesy of LLW Repository Ltd**

*Long lived higher activity particles, items and sources*

We asked LLW Repository Ltd to assess the possible impacts of individuals coming into contact with long lived higher activity particles, items or sources within the waste at the LLWR in the future (i.e. some of the most radiologically hazardous materials the waste could contain). In particular, we are seeking improved understanding of the risks presented following coastal erosion, when it is possible that individuals could be exposed to radioactive material presenting a significant

hazard, even if the chance of this happening is very small.

We have been working with the Health Protection Agency<sup>3</sup> to review the information provided by LLW Repository Ltd in response to this question. The evidence provided by LLW Repository Ltd indicates that impacts will generally be low and in all cases below upper regulatory safety criteria. However, the evidence provided by LLW Repository Ltd also indicates that in some extreme cases, radioactive doses towards the upper end of acceptability could theoretically be incurred following coastal erosion of the site, albeit with an extremely low likelihood of occurrence.

Overall, the Environment Agency agrees with the outcome of the assessment, although we believe a more precautionary approach may be appropriate with regards to future disposal of wastes which could give rise to higher radioactive doses. For that reason, we have drafted additional advice for our assessors on assessing possible impacts from particles and items following any coastal erosion, which takes a more precautionary approach than that currently required by the GRA. We have provided this draft advice to LLW Repository Ltd for information and awareness. We are continuing to work with LLW Repository Ltd and Public Health England to complete this area of assessment.



**The LLWR Grouting Facility, courtesy of LLW Repository Ltd**

*Waste container and grout condition surveys*

Waste is delivered to the LLWR in metal ISO-freight containers. These containers are then filled with grout in the grouting facility, which is designed to provide long term stability to the waste when the site is closed and a final cap put in place.

<sup>3</sup> From 1 April 2013 the Health Protection Agency became part of Public Health England

However, recent work has shown that containers stored at the site for an extended period are not in as good a condition as expected. We therefore requested, and LLW Repository Ltd is undertaking, a series of investigations and assessments of container conditions. These initial investigations have shown that there is some settlement of the grout after placement in some containers, leading to a small void forming in the top of the containers. Additionally, it is evident that certain containers at the top of container stacks are letting in water through open grout ports, leading to slightly enhanced discharges of radioactivity via the site leachate system. These discharges are very small in relation to overall site discharges, which are themselves very low. The discharges are monitored and reported. None the less, we are requiring LLW Repository Ltd to take action to minimise these discharges as soon as practicable.

Further survey work is being undertaken to increase understanding. However, the Environment Agency will expect LLW Repository Ltd to undertake a number of actions that:

- Identify any immediate actions that would represent best available techniques<sup>4</sup> to prevent increased radioactive discharges in the short term.
- Bring forward final capping of Vault 8 as far as practicable to provide early protection to the waste.
- Assess and develop engineering measures or container placement strategies to remove risks to the cap from void settlement.
- Improve future waste acceptance criteria and grouting practice to minimise the risk of void formation.
- Investigate improved container designs to prevent water ingress in the future.
- Re-assess vault sizing and capping strategy to ensure that waste containers are not left exposed prior to capping longer than it can be demonstrated the containers will retain full integrity.

We will assess the adequacy of further survey and assessment work when received and require any necessary improvements to be made.

<sup>4</sup> Best available engineering or operational approaches to limit discharges and waste generation, taking account of impacts, costs, available technology and time constraints.



**Typical ISO container of waste prior to grouting, courtesy of LLW Repository Ltd**

### *Disposal facility engineering*

Our review of the ESC has considered the various engineering elements of the proposed design. For example, the engineered final cap to prevent water ingress and human intrusion, the cut-off wall to direct water flows below ground and the vault leachate drainage systems. We are satisfied that the proposed design represents good practice and a suitable design concept to achieve the objectives of the ESC.

We do however, wish to further understand how LLW Repository Ltd would take high level designs through to detailed designs and then to construction, particularly given that some of the design elements are relatively novel. Therefore, in January we held a workshop with LLW Repository Ltd to review the designs in more detail, but also to understand more fully how they would put the designs into practice over the lifetime of the site. This workshop provided considerable re-assurance that adequate engineering design, development and implementation processes were being applied.

### **Planning permission and Article 37**

In addition to an Environmental Permit issued by the Environment Agency, to operate the site LLW Repository Ltd also requires planning permission from Cumbria County Council. We will provide further input to the planning process as a consultee, following completion of our review of the ESC.

Additionally, UK Government must seek a positive opinion from the European Commission (EC) with regards to an Article 37 submission under the Euratom Treaty. This submission seeks to

demonstrate negligible impacts on other European member states. We await preparation of an Article 37 submission by LLW Repository Ltd on the UK Government's behalf. We will not issue an Environmental Permit to the operator until an opinion from the EC has been received.

## Permitting process

As the technical review of the ESC nears completion the Environment Agency has begun discussions with LLW Repository Ltd in regards to their permit variation application to dispose of further waste, which we anticipate receiving around summer 2013. Once we receive the application we will consult upon it for 12 weeks ensuring the local community and other interested organisations or individuals are able to pass on their comments. We will also consult on any supporting information LLW Repository Ltd supply, such as the ESC and a summary of additional information they have provided to us.

Once the consultation period ends, we will then consider any responses received, alongside our technical review of the ESC and prepare a draft decision on the application. We will then consult upon this draft decision for a further 12 weeks, supported by our published technical review reports. At the end of this process we will reach a final decision, which we expect to be able to communicate publically around summer 2014<sup>5</sup>.

Following the permit variation application, we will also be required to undertake a Habitats Regulations Assessment due to the proximity of the site to the adjacent Drigg Coast Special Area of Conservation/Site of Special Scientific Interest. Cumbria County Council is similarly required to undertake an assessment as part of planning considerations. We are working with Cumbria County Council and Natural England to scope and coordinate assessment requirements.

<sup>5</sup> This timescales may be dependent upon completion of our technical review as predicted, in addition to the scale and scope of any consultation comments received.

## Communications

The Environment Agency will be open and transparent throughout our review process. Although it is the responsibility of the applicant (LLW Repository Ltd) to communicate effectively with community members, groups and professional partners throughout their application process, we will keep you informed of our roles and responsibilities. To this end we continue to attend and provide updates to the LLWR sub-group of the West Cumbria Site Stakeholder Group and attended an open day on 20 September 2012 to explain our role and answer questions put to us by attendees. We also issue these progress reports on our website, along with answers to some frequently asked questions (see [www.environment-agency.gov.uk/llwr](http://www.environment-agency.gov.uk/llwr)).

As we move closer to completing our technical review and receiving a permit variation application, we will hold meetings with interested groups and will hold open public information events at key points in the process. If any individuals or groups would like to find out more about our review we would welcome any requests for meetings or information.

## Opportunities to comment

At this stage in the process, we recommend that any queries with regards to the ESC are addressed to LLW Repository Ltd. Full contact details are provided on their web site at [www.llwrsite.com](http://www.llwrsite.com).

When we receive an application for a variation to LLW Repository Ltd's permit we will consult on this as described above and will welcome any comments at that point.

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