LLW Repository, Holmrook, Cumbria: Repository Development to Vault 11

Planning Statement

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Contents

1 Introduction

1. This Planning Statement accompanies a detailed planning application submitted in respect of further development at the Low Level Waste Repository (LLWR) near Drigg, West Cumbria. The application has been made to Cumbria County Council as the relevant Waste Planning Authority (WPA) for the area in which the site is located.

1.1 The Applicant

2. The application is submitted by LLW Repository Ltd, which is the Site Licence Company with responsibility for operating the LLWR facility on behalf of the Nuclear Decommissioning Authority (NDA). LLW Repository Ltd is committed to operating the LLWR as an efficient and environmentally safe facility, providing a continuing safe option for the disposal of low level radioactive waste (LLW) in the UK. The site is operated in a manner that is consistent with good practice for the near-surface disposal of radioactive waste in accordance with applicable environmental safety and health and safety guidance.

1.2 The Application

1.2.1 Proposed Development

3. The application seeks full planning permission for:

The phased construction of additional vaults (10 and 11 and an extension to Vault 9 (9a)); the disposal of low level radioactive wastes in the new vaults and in the existing Vault 9 including the higher stacking of waste containers in Vault 9; the permanent retention (disposal) of waste containers by means of higher stacking in the existing Vault 8; and the phased construction of a permanent capping layer over Trenches 1-7 and Vaults 8-11 and the site of potential Vaults 12-14; together with other ancillary works.

4. The proposals will involve the following works:

- The construction in a phased manner of additional engineered vaults (Vaults 10 and 11) and an extension to Vault 9 (Vault 9a) within the land area to the south east of the existing Vault 9 for the disposal of LLW.
- The stacking (for disposal) of up to 4 no. (or equivalent) LLW containers in Vault 9a, 8 no. LLW containers (or equivalent) in Vault 10 and 9 no. LLW containers (or equivalent) in Vault 11.
- The permanent retention (disposal) of all LLW within the existing Vault 9.
- Additional stacking (for disposal) of up to 8 no. (or equivalent) LLW containers within the area of Vault 9.
- The permanent retention (disposal) of waste within the existing Vault 8 including the higher stacking of containers which is currently consented under a temporary planning permission (LPA ref. 4/14/9010 – see full summary of

relevant planning history in Section 2).

- The increase in height and extent of higher stacking to provide for the stacking (for disposal) of between 5 and 8 LLW containers (or equivalent) within the area of Vault 8.

- The extension of the existing vertical cut-off walls around the proposed waste disposal area and the extension of the existing secant pile wall adjacent to the trenches and new vaults.

- The phased construction of an engineered and landscaped capping layer above the existing Trenches 1-7, Vaults 8-11 and the site of the potential additional vaults (Vaults 12-14)1

- Related ancillary works and temporary construction facilities/ activities including the diversion of part of the existing Drigg Stream; formation of temporary stockpiles; erection and use of temporary construction/ contractors' compounds prior to each phase of construction activity; construction and use of associated access roads and hardstandings; landscaping and tree planting works; and construction mitigation/ accommodation works.

1.3 Background

5. This application is made following the withdrawal, in February 2015, of a previous full application (LPA ref. 4/11/9007) relating to the same general site area at the LLWR in Drigg.

6. That application sought permission for a larger number of new vaults (5 no. new vaults (Vaults 10 – 14) and an extension to Vault 9 (Vault 9a)) than is proposed in the current application, which would have extended the lifetime of the Repository to around 2080. The application was withdrawn following extensive discussions and negotiations with the WPA in respect of its concerns regarding the long time period over which the proposed vaults would be expected to receive LLW.

7. The new application is much more modest in terms of the additional waste disposal capacity that is being sought on the site at this time. The new application and supporting information has been framed expressly to respond to the WPA's central concerns with regard to the demonstration of need for the proposed additional capacity and the manner in which the anticipated timescales over which wastes would be received relative to the plan period for the Cumbria Minerals and Waste Core Strategy.

8. The supporting information and accompanying Environmental Statement has been produced in order to ensure that a number of other technical matters that had not been resolved at the time of withdrawal of the first application are fully addressed in the new application submission.

9. Following extensive joint working with the WPA and its consultants, over a number of months, LLW Repository Ltd and its consultancy team is confident that the new application contains all the information that is needed for the WPA to consider and

[1] For the avoidance of doubt, the construction of and use of potential Vaults 12-14 does not form part of the current planning application.

determine the application within the statutory 16 week period and that the proposals are compliant with the development plan (comprising the Cumbria Minerals and Waste Development Framework: Core Strategy and Generic Development Control Policies DPD, the Copeland Local Plan: Core Strategy and Development Management Policies, and the saved policies of the Copeland Local Plan 2001 – 2016) and the National Planning Policy Framework (the Framework). LLW Repository Ltd has also agreed the format and scope of the application with WPA, and has provided draft copies of key application documents and drawings in advance of submission to help ensure that the WPA has the necessary information to enable the application to be determined within the relevant statutory period.

10. This statement sets out the statutory background for the operation of the LLWR and considers the significant development and advancement of policy and strategy, over recent years, with regard to the management of LLW in the UK. The statement describes the proposals in detail and the need and justification for these to be taken forward by LLW Repository Ltd. The statement reviews relevant planning policy at the national and local level and assesses the proposals against this relevant policy context.

11. The case in support of the proposals is clearly set out in the statement in terms of the need for forward capacity for LLW disposal at the site in order to meet the UK's needs and the benefits of a planned and comprehensive approach to the capping and final closure of the facility. The statement concludes that the proposals are consistent with the development plan and other relevant planning policies and that planning permission should be granted without delay.

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2 The Application Site and Surroundings

2.1 The Location

12. The LLWR is the UK's principal facility for the disposal of LLW and is owned by the NDA. The LLWR lies on the Cumbrian coast immediately to the west of the village of Drigg and to the south east of Seascale.

13. The LLWR is accessed from the B5344, which runs west from the A595 at Holmrook, through the centre of Drigg, to continue north to Seascale and Gosforth. The A595 is the main strategic route serving West Cumbria and connecting Workington with South Lakeland and the A66 to Penrith. The site is located adjacent to the Cumbria Coast Line railway and is equipped with dedicated rail sidings which enable both waste and construction materials to be brought to the site by rail.

2.2 LLWR Site

2.2.1 Site Operations

14. The safe disposal of waste is a vital part of any industrial or decommissioning process. The role of LLW Repository Ltd is to ensure that low level radioactive waste generated in the UK is managed and disposed of in a way that protects people and the environment.

15. Originally established in 1959, on the site of a former World War 2 munitions factory, LLWR is the UK's national repository for the disposal of LLW and is one of 17 sites owned by the NDA. LLW Repository Ltd has managed the site since July 2007. The site has safely operated as the nation's low level radioactive waste disposal facility for over 50 years and more than £100 million has been invested in the infrastructure of the site over the past decade to maintain the facility as an important asset for the UK.

16. As the UK's principal disposal facility for LLW the site is the only facility that is permitted to receive all categories of LLW from across the UK. In accordance with the application of the waste hierarchy, LLWR encourages the use of alternative options of re-use, recycling, or alternative means of disposal where practicable. In line with the NDA's statutory duty to operate the facility as the national repository for LLW, there is however a requirement that the site should receive all consignments of waste for which no such alternative exists provided that the waste meets the facility's Waste Acceptance Criteria and radiological capacity constraints.

17. Most of the waste, typically comprising paper, cardboard, plastic, protective clothing, soil, rubble and metal, arrives at the site in half height ISO waste containers (HHISOs). The great majority of waste is brought to the site by rail and it is anticipated that this will continue to be the case over the long term future although access by road will need to be maintained, particularly for items that are too large to be transported on the rail network. On receipt at the LLWR, the waste is checked to ensure compliance with the LLWR Waste Acceptance Criteria (WAC). The LLW is then grouted in the containers prior to disposal in engineered concrete vaults. Waste not contained within an HHISO is subject to the same acceptance checks and is then

transferred directly to Vault 8 (see below) where it is grouted in situ using standard concrete placement techniques (in-vault grouting).

2.2.2 LLWR Site Description

18. The LLWR site covers an area of around110 ha and is broadly rectangular in shape and slopes gently from around 20 m AOD on the north east boundary to 7 m above sea level at the south west side. The LLWR includes the main disposal area, railway sidings and waste reception area, a grouting facility, office accommodation and ancillary facilities which are connected by a network of internal service roads. The main facilities on the site are described below.

2.2.3 Rail Sidings

19. The rail sidings are located at the northern edge of the site, close to the main site entrance and access control building off of Old Shore Road, and form the transport hub for the import and export of waste and the import of construction materials. Although the vast majority (88%) of LLW arrives by rail some deliveries are also made to the site by road. All waste is checked and unloaded at the receipt area on the rail sidings.

2.2.4 Grouting Facility

20. The containerised waste is transferred from the reception area to the on-site grouting facility where voids within the container are filled with a specialised grout prior to the containers being moved to the engineered, concrete vaults. Once the grout has set, the container is transferred to the vaults for storage or disposal.

2.2.5 The Reference Disposal Area

21. The waste disposal facilities and operations are located in the northernmost part of the site at the furthest point from Drigg village. This area, known as the Reference Disposal Area includes:

Trenches 1-7

22. Prior to the construction of the first engineered vault, waste was disposed of by means of “tumble tipping” in a series of lined trenches. The site has seven trenches, which occupy the north eastern half of the Reference Disposal Area. These trenches have been covered with an interim cap to reduce water entry and to help prepare the site for closure; the cap forms a rounded mound, rising to approximately 26 m AOD at its highest point. Routine environmental monitoring of the trenches continues to take place

Vault 8

23. Vault 8, the first of the engineered vaults to be constructed on the site, was commissioned in 1988 and is located in at the northern edge of the Reference Disposal Area. The vault extends to some 240 m by 170 m and is an open, multi-barrier concrete structure set partially into the ground and comprising concrete lined walls and a drained floor slab. The containers are stacked inside the vault in a similar arrangement to that used in a container port. The original capacity of Vault 8 has been almost fully used for the disposal of waste but LLW containers are also stored

as “additional height stacking” under a temporary planning permission (LPA ref. 4/04/9018)[2]. This permission has recently been extended (LPA ref. 4/14/9010) to provide that the additional containers must be moved from Vault 8 by 31 March 2017.

24. This revised planning application seeks permission to retain the temporarily stored containers and to further increase the height and area of the high stacking in order to provide more capacity for the disposal of LLW within Vault 8.

Vault 9

25. Vault 9 was completed in 2010 and provides additional capacity to meet the UK's low level waste management needs. The vault lies immediately to the south of Vault 8 and was constructed under a planning permission (LPA ref. 4/07/9010) which provides for the use of the vault for the storage of LLW for a temporary period, with the requirement that all LLW is removed from the vault by the end of 2023. The Vault 9 construction incorporates advances in technology, with its multiple layers of protection to provide both for the safe storage and final disposal of LLW. This revised application seeks planning permission for the permanent retention (for the purposes of disposal) of all the LLW that is currently stored in Vault 9 and for the higher stacking (disposal) of LLW waste containers at a higher level than approved in the current permission (4/07/9010). There is land available between Vault 9 and the western boundary of the site to enable the construction of an extension to Vault 9, which is referred to in the application as Vault 9a.

Leachate Management

26. Water from the trench drains and rainfall landing on the trenches and within Vaults 8 and 9 is collected as leachate in the vault drainage system and is routed, by means of gravity flow, through interceptor drains to a common point and then into a set of holding tanks, located on the western edge of the site. The leachate held here is “flow proportionately sampled” to check its quality before being pumped, via a buried pipeline, to the marine discharge point in the Irish Sea. The pipeline discharges into the sea through three diffusers at a distance of around 1.2 km off shore.

PCM Magazines and Stockpile Area

27. The remaining area to the south of Vault 9, between the trenches and the western boundary of the site, contains a series of redundant magazines, which were constructed for the production and storage of TNT when the site was a munitions factory but were subsequently used to store Plutonium Contaminated Material (PCM). The PCM has been retrieved and returned to Sellafield for storage.

28. This part of the site also includes a temporary stockpile of material that was excavated during the construction of Vault 9, this material having been retained for use in the final capping of the site.

29. LLW Repository Ltd has commenced the decommissioning of the redundant magazines in accordance with a planning permission (LPA ref. 4/99/9030) granted by the WPA in 2000 and subsequently amended on a number of occasions, most recently in 2013 (LPA ref. 4/13/9008) which extended the time period for the removal

[2] Subsequently varied through 4/09/9014 to extend the period that waste can be higher stacked to 31 December 2015

of the magazines to 31 December 2022) and this work is expected to be completed during the timescale of the proposed application.

30. The decommissioning and demolition of the magazines will provide an area of cleared land with sufficient space for the development of a further 5 disposal vaults of a similar size to the existing Vaults 8 and 9 and will also make available on-site materials (soil, aggregates and concrete rubble) for use in future construction works. The potential additional disposal capacity within this area has been referred to in the Environmental Safety Case (ESC) as that provided by Vaults 10 – 14.

2.2.6 Extent of Planning Application Site

31. Planning permission is not being sought for Vaults 12-14. As part of this application the final cap which forms part of the application proposals will cover the area both of the existing trenches and Vaults 8 - 11. The final cap will still extend over the vast majority of the Reference Disposal Area and the site boundary for the planning application therefore includes all of this area. This equates to 45.11 ha

32. The application site also includes a detached area, to the south of the Reference Disposal Area, which is proposed to be used for stockpiling of materials to be used in the final capping of the site until such time as these are required. This area is of 2.44 ha, giving a total combined application site of 47.54 ha.

33. An existing watercourse, Drigg Stream, runs north west to south east inside the site, parallel with the western boundary. This connects with other streams in the immediate locality and flows south to the estuary of the River Irt. The application proposals include the proposed diversion of a section of the stream to facilitate the construction of potential additional vaults (up to Vault 14).

2.2.7 Surrounding Area

34. Occupying a coastal location, the LLWR site adjoins an area of sand dunes and marsh that are located within the Drigg Coast Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC), which extend to the west of the site between the LLWR and the sea. Both of these areas have been designated as protected areas in respect of species / habitats. The salt marsh of the Ravenglass Estuary lies to the south. This section of the Cumbrian coastline also forms part of the Cumbria Coast Marine Conservation Zone.

35. The adjacent beach is crossed by the Cumbria Coastal Path long distance footpath (No. 72) and this turns inland adjacent to the LLWR to follow the route of Shore Road around the southern boundary of the site, before passing through Drigg village. A second public footpath runs along the northern boundary of the site.

36. Drigg village is centred on the B5344, which runs from the site to the east to join the A559 at Holmrook. The remainder of the area to the east of the site, beyond the railway, consists mainly of open farmland with scattered houses and farm buildings.

3 Form and Content of Application

37. The proposed development falls within Schedule 1 (paragraph 3(b) (v) of the Town and Country Planning (Environmental Impact Assessment) Regulations 2011(as amended) (the regulations); *i.e. the carrying out of a development to provide solely for the storage (planned for more than 10 years) of irradiated nuclear fuels or radioactive waste in a different site than the production site.*

38. These regulations require an Environmental Impact Assessment (EIA) in every case for Schedule 1 development and, as such, an EIA has been undertaken and a full Environmental Statement (ES) and Non-Technical Summary (NTS) have been submitted with the application.

39. Under Regulation 5 of the 2011 Regulations the EIA has been undertaken in accordance with the scope agreed with the WPA and confirmed in the Scoping Opinion issued by the WPA on the 25 September 2015. The resultant ES sets out a full assessment of the development proposals in respect of the following potential effects:

- Radiological and non-radiological effects;
- Transport and access effects;
- Noise effects;
- Landscape and visual effects;
- Ecology and nature conservation;
- Effects on air quality;
- Effects on geology, soils and hydrogeology;
- Aquatic impacts;
- Economic and social impact; and
- Sustainability assessment.

40. In addition to the EIA information the application is also accompanied by the following plans and documents:

- Application forms and certificate
- Application Drawings (in Volume II of the ES – see Appendix 1 for a schedule of application drawings)
- Planning Statement (including Statement of Community Involvement (SCI)) prepared by Turley
- Environmental Safety Case Drawings(in Volume III of the ES)
  - E-01 Plan and typical cross-sections (revised)

  - E-02 Long sections (revised)
  - E- 03 Plan showing Half Height ISO containers (revised)
  - D- 03 Cap- typical details
  - D- 04 Vault and edge details
  - D- 05 Cap – vent details
  - D- 06 Typical Sections
  - D- 07 Trench Cap edge details
- Construction Sequence Drawings (in Volume III of the ES)
  - C- 01 Phase 1 (schematic)
  - C- 02 Phase 2 (schematic)
  - C- 03 Phase 3 (schematic)
  - C- 04 Phase 4 (schematic)
  - C- 05 Phase 5 (schematic)

3.1 Pre-Application Advice

41. LLWR and its team of advisers held a series of meetings with WPA officers and their consultants in respect of the previous, now withdrawn, application. These discussions culminated in a number of workshops with officers, the WPA's consultants and Natural England to discuss and agree the scope of a revised planning application; agreement was also reached on the supporting information that would be required to enable officers to process their consideration of the revised proposals and to report the application to Committee for determination within as short a time as possible.

42. The previous application was withdrawn following the issue by the WPA, in February 2015, of a formal pre application advice letter in respect of the proposed new application and further workshops were subsequently held to agree further detail with regard to some elements of the supporting information and related survey work.

43. The application submission has been prepared in accordance with the pre-application advice letter (enclosed at Appendix 2) and the agreements reached in these subsequent discussions with the WPA.

44. Extensive stakeholder and public consultation was undertaken in respect of the first planning application. This has not been repeated to the same extent in relation to the revised proposals although regular updates have been provided to the LLWR Stakeholder Group. Whilst the key issues concerning the proposals are much as for the first application the new scheme is much more modest in terms of the number of vaults and future capacity for which permission is being sought. A public consultation event was held on 17 September 2015. All responses received were positive, confirming support for the proposed development. Some respondents provided

comments on specific issues to be addressed through the application. This consultation is in addition to that carried out in respect of the previous application and on the Environmental Safety Case. Full details are included in the SCI at Appendix 3.

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4 Background to the Proposals

45. In order to provide a contextual background to the need for the additional capacity it is useful to set out the wider statutory and regulatory framework in which the LLWR is operated and to explain some of the key developments and changes in this framework which have taken place over the past 10 or so years.

4.1 Role of the NDA

46. The NDA is the body with overall responsibility for the decommissioning of all the nuclear generating stations which are programmed to be taken out of use and associated sites and facilities and for the management and disposal of all radioactive waste material. The NDA was established by government under the Energy Act 2004. The Act identities the key role of the LLWR and imposes a statutory duty on the NDA to continue to manage the LLWR as a national repository for LLW and to operate the site to store, treat, transport and dispose of hazardous material (Section 16 of the Energy Act 2004 and Schedule 2 to the NDA Designation of the LLWR).

47. Whilst the statutory duty rests with the NDA the site is operated on its behalf by LLW Repository Ltd under a nuclear site licence and environmental permit granted in 2007. This means LLW Repository Ltd is charged with ensuring that the NDA can discharge its statutory duty in a safe and effective manner.

4.2 Development of UK Policy and Strategy for the Management and Disposal of LLW

48. The White Paper – The Review of Radioactive Waste Policy – Final Conclusions (Cm2919) was published in 1995, there was no further development of government policy in this area for the next decade. The absence of an up-to-date policy led to major difficulties within the industry in the face of rapidly reducing disposal capacity and the likely lead in time and major investment required to create new disposal capacity at LLWR.

4.2.1 Policy for the Long Term Management of Solid LLW – March 2007

49. In 2007 the Government published a new policy statement. This did not provide a detailed strategy for the future management of LLW but instead set out a high-level framework; this effectively deferred a decision on a final strategy until a full review of future disposal need and the management of LLW had been undertaken. As part of this framework the policy statement required the NDA to:

- develop and publish a long-term plan for the optimal use of the LLWR;
- review the scope for greater application of the waste hierarchy in the management of solid LLW and to identify the need for new waste management and /or disposal routes;
- assess if, and at what point in the future, a replacement facility or facilities might be required and planned for on the basis of a better use of the waste hierarchy; and

- develop a UK Strategy for the long term management of solid LLW from the nuclear industry.

50. The publication of the March 2007 Policy Statement coincided with the making of the planning application for the construction of Vault 9; that application being required because there was very little spare capacity remaining in Vault 8. However, the decision was taken that the application for Vault 9 should seek permission for the storage rather than disposal of LLW because LLW Repository Ltd had still to demonstrate the safety of final disposal of LLW in Vault 9 through the development of its ESC.

4.2.2 Developing a UK Nuclear Industry LLW Strategy

51. Following the 2007 Policy Statement the NDA and LLW Repository Ltd (as its strategic partner) commenced work, together with the relevant stakeholders, on the actions that the statement required. The complex three-year process illustrated in Figure 4.1 below began with the production of the LLW Strategic Review of January 2009. This key document provided a full understanding of the UK inventory of waste arisings and a clear evidence base. This enabled a robust assessment of key issues and the options that should be tested and allowed the development of a preferred strategy including full stakeholder engagement and consultation.

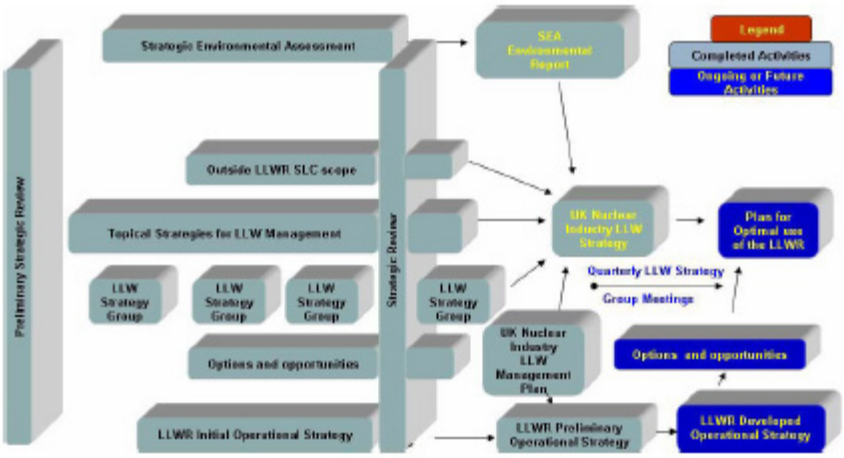

Figure 4.1: Process for Development of the UK Nuclear Industry LLW Strategy

52. The Strategic Review of LLWR has confirmed its role and importance as the sole facility for the assured and safe disposal of a wide range of LLW from numerous waste consignors, and as the only national facility which is able to accept certain categories of waste. Accordingly, the role of the facility and the need to optimise its use proved to be a central factor in the review process as the diagram illustrates. The resultant suite of UK Strategy and LLWR Operations documents is therefore fully coordinated and consistent with a common purpose.

53. The 2009 Strategic Review demonstrated that, over an 80-year period, the UK is expected to generate some 2.4 million cubic metres of LLW (from a 2008 base date). This contrasts with the assessment of potential future capacity at LLWR (assuming disposal of waste in Vault 9 and the development of the potential capacity in Vaults 9a to 14) at around 0.7 million cubic metres. This assessment suggested that, even assuming the maximum likely application of the waste hierarchy in the management of LLW, the expected arisings would significantly exceed the potential remaining capacity.

Hence alternative ways to manage LLW will be needed alongside the provision of additional capacity at the LLWR. Further consideration of waste arisings is provided at paragraphs 255 – 275 below.

54. The UK Strategy for the Management of Solid Low Level Radioactive Waste from the Nuclear Industry

55. The Strategy produced as a result of this extensive programme of work was published in draft in 2009 and, following consultation, was produced in its final form in August 2010. The Strategy was formally approved by the Secretary of State in the same month.

56. The central objective of the UK Strategy is to provide a high-level framework for the continued capability and capacity for the safe, secure and environmentally responsible management and disposal of LLW in the UK for both the nuclear and non-nuclear industries.

57. The UK Strategy states that the waste hierarchy should be applied in the management of LLW with a preference for all waste streams to be managed at the highest level in the hierarchy where practicable; i.e. in the priority order of waste prevention, re-use, recycling and disposal as set out in the waste hierarchy. The Strategy advocates that the application of the waste hierarchy over the long term will help to facilitate continued waste management, hazard reduction and decommissioning operations. The use of a broader range of options for managing LLW, rather than focusing on disposal, will assist the further development of capability and capacity for management of LLW in accordance with the central objectives of the Strategy.

58. Having regard to the 2009 assessment of likely LLW arisings and the identified existing and potential capacity at LLWR, the UK Strategy is founded on three key themes of:

- the application of the waste hierarchy;
- making best use of existing LLW management assets; and
- the need for new fit-for-purpose waste management routes.

59. LLW producers have already implemented changes in the way their LLW is managed and LLW Repository Ltd is equally committed to transforming the LLWR from a storage and waste handling site, to a fully integrated waste management operation, providing full services across the broad spectrum of waste management activities in support of LLWR and consignor initiatives. Through its framework contracts LLW Repository Ltd offers metallic waste treatment, combustible waste treatment, super-compactable waste treatment, very low level waste and low level waste disposal services across its entire customer base, and has also expanded its service offering to include additional packaging, transport and customer support services..

60. It is plain however that, notwithstanding the development of new waste treatment routes and processes and a greater application of the waste hierarchy in LLW management, the continuing need and role of the LLWR in providing an assured route for LLW disposal remains critical and must be prioritised. This is made clear in the UK Strategy:

'*The UK's only management route for certain LLW, and the only facility in the UK that can accept a wide range of LLW from numerous waste producers, is the Low Level*

Waste Repository (LLWR). Its continued availability is considered vital by both nuclear industry and non-nuclear industry LLW producers.'

61. The Strategy acknowledges that the extended operational lifetime of the facility, the continued disposal of waste into future vaults and the subsequent closure and capping of the LLWR, is dependent upon the completion and approval of the Environmental Safety Case (ESC) for the site by the Environment Agency.

62. The deployment of additional disposal capacity at the LLWR and the measures to optimise and prolong its operational lifetime, are therefore central to the successful implementation of the UK Strategy for the Management of Solid Low Level Radioactive Waste from the Nuclear Industry.

63. The UK Strategy is founded on making the best use of "precious resource" of disposal capacity and clear expectation that, with the Government's commitment both to the construction of a new generation of reactors and the decommissioning of existing and redundant generating stations and other facilities, the UK will generate considerably more solid LLW than can be disposed of at LLWR even assuming development of the additional capacity identified in the potential new vaults (Vaults 9a to 11).

64. The Strategy confirms that the optimisation of the use of LLWR is central to meeting the future LLW management needs and that it is important that the capacity at LLWR is preserved and used wisely. As the only national facility which can accept a wide range of LLW that cannot be treated by other means or disposed of at another site, the continued availability of LLWR is considered by nuclear and non-nuclear LLW producers to be vital. While the Strategy seeks to reduce reliance on disposal it recognises that there are some wastes that are not amenable to being managed at a higher level in the waste hierarchy and that this requires making best use of the LLWR. The Strategy looks to extend the life of the LLWR to ensure that there is disposal capacity available over the long term.

65. The UK Strategy has been prepared and approved in accordance with the requirements of the 2007 Policy Statement. The Policy Statement requires that the UK Strategy be used by national and local planning authorities as guidance when preparing their planning strategies for waste management and, hence, to inform decision making.

66. Consultation on a revised Strategy for the management of solid low level waste took place between January and April 2015. It reflects that a number of changes in terms of the management of LLW have taken place since the publication of the 2010 Strategy. They comprise:

- the diversion of significant volumes of LLW from the Low Level Waste Repository;
- the development and use of alternate treatment and disposal routes;.
- the application of the waste hierarchy by waste producers when making waste management decisions; and
- the identification of opportunities for improvement and the sharing of good practices for LLW management.

67. It underlines that implementation of the strategy will continue to be through the National LLW Programme managed by LLW Repository Ltd.

68. The draft Strategy has three strategic themes central to the strategy, all of which are consistent with the current Strategy. They are:

- application of the Waste Hierarchy ;
- the best use of existing LLW management assets; and
- the need for new fit-for-purpose waste management routes.

69. The draft Strategy confirms that the LLWR remains a key strategic asset for UK's management of LLW, and it proposes to extend the life of the LLWR to ensure long-term capacity.

70. Whilst the draft Strategy has been published it is at an early stage of preparation and has been subject to consultation. As such limited weight can be placed on it in the decision making process.

4.2.3 The NDA Strategy (March 2011)

71. In parallel with the production of the UK Strategy the NDA has also developed a Strategy for the future management of its assets and this strategy was approved by the Government and published in its final form on the 21 March 2011.

72. The NDA Strategy also confirms the LLWR as the only facility that can accept a wide range of LLW from the NDA estate and other producers and the only one that can receive wastes which cannot be accepted elsewhere. The Strategy confirmed that, despite the on-going development of alternative means of management (see below) most solid LLW was (as of 2011) still being consigned for disposal in the absence of suitable alternatives at LLWR; this continues to be the case. In the circumstances where the UK LLW arisings are expected to significantly exceed the identified potential disposal capacity at LLWR, the Strategy seeks to make use of the LLWR in the most effective way in order to avoid the need for a replacement facility to be provided. Hence, the NDA has given full and careful consideration to the question posed in the 2007 as to whether and, if so, when a new disposal facility might need to be planned for and provided, and concluded, as confirmed in the approved Strategy, that there is no such requirement in the foreseeable future provided the identified capacity at the LLWR is used wisely in the period to 2080 and potentially beyond.

73. As a consequence the focus of the NDA Strategy is on optimising the use of the LLWR and no further work has been, or is being, undertaken with regard to the identification of any new disposal site or facility. The Strategy did, however, identify that, if a decision was taken to pursue the option of developing a new facility, it would be likely to take at least 15 years in order to identify and secure a suitable site, obtain the necessary planning and other consents, develop the site and bring the new LLW management and disposal facilities into commission.

74. The Strategy noted that LLW Repository Ltd was undertaking a detailed assessment of the site to determine whether the potential additional capacity that had been identified at that stage, could be further increased so as to enable the site to continue to operate beyond the 2080 end date as projected in the Strategy (see reference to the assumptions underpinning the Environmental Safety Case below).

4.2.4 Making the Best Use of Existing LLW Management Assets

75. The UK Nuclear Industry LLW Management Plan was developed alongside the work being undertaken on the UK Strategy and was published in its final form in December 2009.

76. In addition to looking at future disposal capacity, the Plan is concerned with providing a safe and effective permanent cap to the area where LLW has already been disposed of as soon as practicable and has assessed options for achieving this. Objective 8 of the approved Plan is to optimise the closure engineering of the LLWR by designing a more innovative and efficient cap for the site than previously envisaged, This approach requires that the site not only fully performs against the environmental safety standards of the Environmental Safety Case (see below) but also integrates the cap design with the provision of future capacity to meet the needs of the planned decommissioning programme and future waste arisings. Hence there is a need to provide a design which is capable of phased implementation to enable the permanent cap to be installed over part of the site while leaving access to the existing and future vaults where disposal capacity remains available.

77. A final Development Operational Strategy (doc ref. 1009/LLWR/LTP) for the LLWR was published in March 2010 and set out a number of recommendations for LLW Repository Ltd to adopt in its continuing operation of the site in order to extend the life of the facility in order to play a central role in the implementation of the UK Strategy.

78. Section 5 of the Operational Strategy sets out a scheme of site operations and works to provide assured disposal capacity over the long term. These involve the retention and use of Vault 9 for the permanent disposal of waste and a programme to deploy the proposed additional vaults (9a to 14) and the phased implementation of the final cap. The cap design is determined by the existing contours of the interim cap over Trenches 1-7 and the maximum gradients that can be achieved to ensure the stability of slopes and overall landform. This design facilitates higher stacking of LLW containers within Vaults 8 and 9 and the proposed new vaults; this has the dual advantage of maximising disposal capacity whilst, at the same time, reducing the volume of material that will need to be brought into the site to construct the cap to provide the desired final landform.

79. The Operational Strategy is clear in its acknowledgement that the implementation of these proposals is dependent upon the preparation and approval by the Environment Agency of the requisite Environmental Safety Case for the site.

4.3 The Environmental Safety Case (ESC)

80. Under the terms (Requirement 6 of Schedule 9) of its Environmental Permit for the use and operation of the site for LLW disposal, LLW Repository Ltd was required to submit its ESC for the site by the 1 May 2011. The ESC was submitted to the Environment Agency in May 2011. Following a technical review by the Environment Agency and their advice that the ESC was adequate to support an application for a revised Environment Permit for disposal, an application was made in 2013. The revised Permit for disposal has been granted, effective from 1st November 2015.

81. The ESC demonstrates that the LLWR could continue to operate and receive LLW as the UK's primary facility for disposal of LLW that cannot be managed by other means or safely disposed of elsewhere until approximately 2130 and that this can be achieved

in a safe and environmentally responsible manner. The broad case in support of the site works included in the ESC is that:

"working within a sound management framework and a firm safety culture, while engaging in dialogue with stakeholders, LLW Repository Limited has characterised and established a sufficient of all aspects of the LLWR site, and their evolution relevant to the environmental safety of the facility. On that basis, LLW Repository Ltd has carried out a comprehensive evaluation of options to arrive at an optimised Site development plan for the LLWR, which it has assessed to demonstrate the environmental safety of the facility and derive the radiological capacity and conditions under which waste can safely be disposed".

82. The ESC comprises two levels of documents with a single, "Level 1" report outlining the proposals for the future management of the LLWR together with the main arguments concerning environmental safety and how this is to be achieved, and a series of "Level 2" reports that present the supporting evidence base and technical data. The work undertaken to prepare the ESC has included:

- Improving the understanding of the historic wastes at the LLWR which have already been disposed of in the trenches and Vault 8.
- Evaluating the base data upon which the estimates of the forward inventory of disposals to the facility will depend.
- Reviewing closure engineering designs to support the final closure of the LLWR.
- Long-term studies of coastal erosion, taking account of climate change and projected rises in sea level.
- Obtaining detailed geological data and using it to show accurately groundwater movement to predict the likely movement of any contamination from the waste.
- Developing models to estimate the effects of any radioactive chemotoxic materials entering the environment.

83. The main conclusions arising from the detailed investigations and analysis and of the main issues considered by the ESC are summarised below.

4.3.1 Coastal Erosion and Climate Change

84. Climate change is leading to rising sea levels that will increase coastal erosion. Available evidence suggests that the LLWR will start to be eroded on a timescale of a few hundred to a few thousand years and this will result in disruption to the Repository over a timescale of one to a few thousand years.

85. All near-surface disposal facilities are vulnerable to long- term disruption by natural processes and/or human actions and this is taken into account by setting limits on the waste that may be disposed of. The ESC demonstrates the safety of the facility for the disposal of LLW even if coastal erosion of the site does occur.

4.3.2 Radiological Capacity

86. The ESC demonstrates that the LLWR can safely accommodate all of the LLW waste arisings requiring vault disposal identified in the UK Radioactive Waste Inventory (base date of 2013), subject to certain assumptions as to waste management and acceptance conditions.

4.3.3 Trench Inventory

87. LLW Repository Ltd has derived an inventory of wastes in the trenches based on a range of sources of information, including the original disposal records.

88. Interviews with former staff at the site and Sellafield were undertaken about waste disposal practices at the time. This process did not identify any significant or quantifiable impact on the derived inventory used in the ESC.

89. Once closed, the LLWR site will remain subject to institutional controls as long as is required by the relevant regulatory regime so as to manage risks to people and the environment.

5 The Proposed Development

90. The proposals comprise a series of works that collectively provide for the construction of new vaults to provide additional disposal capacity and for the eventual final capping of the site and its future closure. The proposals comprise:

- an increase in the permitted height of HHISO freight containers stacked in Vault 8 for the permanent disposal of low level waste with containers being stacked up to eight containers or equivalent in height;
- the permanent retention of all containerised stored waste and the use of Vault 9 for the permanent disposal of low level waste with containers stacked up to between five and eight or equivalent in height;
- an extension of the secant pile wall adjacent to Trench 3 and the proposed Vaults 10 – 11;
- the construction of Vaults 9a, 10 and 11 and their use for the permanent disposal of LLW with containers stacked up to four or equivalent in height in Vault 9a, up to eight or equivalent in height in Vault 10 and up to nine or equivalent in height in Vault 11;
- the installation of the remaining sections of a vertical cut-off wall around the perimeter of the disposal area;
- the phased installation of a final engineered and landscaped cap over Trenches 1 to 7 and Vault 8 - 11;
- together with ancillary works and temporary construction facilities, including the diversion of the length of Drigg Stream to the perimeter of the disposal area; landscaping and tree planting works; the formation of material stockpiles; the formation of contractors' compounds for each construction phase and associated access roads, hard standing and construction mitigation works.

5.1 Vaults 9a - 11

91. The design of the future vaults has been developed from that successfully developed and implemented for Vault 9. As such, most aspects of planning, design and construction have already been extensively investigated, addressed and validated, consistent with the requisite application of sound science and good engineering practice.

92. The key functions of the vaults have been identified as being:

- structural stability;
- segregate waste forms;
- operational efficiency;
- operational flexibility; and

- a component of the leachate collection system.

9.3 The capacities and timetables for the construction, filling and capping of all vaults are as set out in Table 1 below.

Table 5.1: LLWR Vaults Capacity and Programme

Vault No	Volume	Constructed by	Filled by	Capped by
	m^3	year	year	year
Vault 8	308,000	Complete	2016	2022
Vault 9		Complete	2023	2025
Vault 9A	23,000	2020	2023	2025
Vault 10	120,000	2023	2030	2032
Vault 11	120,000	2030	2045	2051
Total Vaults 8-11	818,000			
Total Vaults 9-11	510,000			

94. The western perimeter walls of future vaults will continue the line of the western perimeter of Vault 8.

5.2 Secant pile wall

95. The existing secant pile wall on the eastern side of Vaults 8 and 9 will be continued southwards to provide support to the adjacent Trench 3. The design and construction will be essentially similar to that for Vault 9, i.e. heavily reinforced structural 'hard' piles at around 1200 mm diameter and 1100 mm centres, cut into 'soft' piles to provide lateral continuity and integrity.

96. The secant pile wall provides structural support to the trenches during the construction and operation of the vaults and is not designed as being water-retaining, or to be relied on to provide an impermeable barrier.

5.3 Cap Components

5.3.1 General - Key Functions and Principles

97. The principal components of the cap are presented in ESC Drawing D-03. The material requirements for the individual components of the capping system are presented and discussed sequentially, from top to bottom.

5.3.2 Surface Soil and Vegetation

98. The primary functions of the surface soil and vegetation are to:

- minimise erosion and promote stability;
- provide a growing medium for surface vegetation, both as a means of minimising erosion and promoting aesthetic/landscaping benefit; and
- provide adequate water retention capacity consistent with the subsequent vegetation, to reduce infiltration of precipitation and sustain vegetation through dry periods, without compromising stability.

99. The vegetation will assist in preventing erosion and reducing infiltration, through evapotranspiration. The final specification will be developed and agreed with planners and landscape specialists to:

- match the existing / preferred final ecology of the area;
- provide best practical resilience and resistance to erosion;
- contain roots that will not disrupt the drainage or barrier layers; and
- be capable of surviving and functioning with little or no maintenance.

100. Following active ecological management, the vegetation will continue to evolve naturally in response to climatic and natural change. Suitable surface soil will form the main rooting medium for the plants in the vegetation layer. This forms the upper surface profile to the capping. The proposed 300 mm thickness is considered suitable for the range of anticipated plants and climate. Hardy and shallow rooting species that are able to withstand the weather conditions at the site are proposed. Perennial grasses and low-growing plants would be an appropriate low maintenance and self-sustaining solution. The existing soils from the interim cap will be stripped and stockpiled for re-use on the final cap. Where insufficient site won restoration soils are not available, other suitable imported soils will be used; locally sourced where possible for compatibility with the local flora and subject to the soils not impacting on the safety functions of the cap.

101. Whilst suitable tree species (i.e. having limited height and limited root depths) can be planted on landfill caps without deleterious effects to clay liner, it is considered prudent to exclude deliberate planting of trees from the cap and to remove or manage any trees that might try to establish themselves through the active control stage.

102. This restriction does not extend to the edges (i.e. outside the footprint of the wastes) where trees can provide valuable landscaping and screening without detriment to the cap. Consequently the depth of cover soils is increased on the edges of the cap, which, with steepening of edge slopes up to around 1 in 10, is considered suitable for screening planting.

5.3.3 Moisture Retention Layer

103. A 300 mm thick moisture retention layer is proposed beneath the surface soil. Its primary function is to increase the water storage capacity in the upper part of the cap to sustain vegetation and assist evapotranspiration. It also serves to limit infiltration to the

underlying drainage layer, encourage run-off and provide protection for the underlying layers from erosion, frost penetration and desiccation.

5.3.4 Filter Layers: Fine and Coarse Filter

104. The function of the filter layers is to minimise particle migration into the underlying bio-intrusion and drainage layers. Particle migration would lead to clogging of these layers, which would be detrimental to their performance. A suitably designed and constructed two-stage (fine and coarse) filter is consistent with best practice.

5.3.5 Bio-intrusion Layer

105. The function of the bio-intrusion layer is to prevent possible damage to the integrity of the low permeability barrier by burrowing animals, penetrating roots and human intrusion. The layer provides additional protection from erosion.

5.3.6 Drainage Layer

106. A 500 mm thick layer of clean coarse gravel is proposed to provide drainage from above the barrier layer to drains at the perimeter of the cap.

107. The function of the drainage layer is to provide subsurface drainage above the impermeable barrier layers within the cap by intercepting infiltration and promoting lateral drainage. Draining infiltration from the overlying soil means that the potential for a standing head of water above the low hydraulic conductivity layer is minimised. It also maintains the stability of the cap by reducing and controlling pore water pressures at the interface to the underlying barrier layer.

108. This is important where there is sufficient rainfall to potentially saturate the cover soil.

5.3.7 Protector Geotextile

109. A geotextile protection layer is required over the underlying geomembrane. This is designed to prevent damage to the proposed geomembrane from the drainage material above, in accordance with best practice design and construction guidance.

5.3.8 Composite Impermeable Barrier

110. The principal function of these layers is to provide an impermeable barrier to rainfall infiltration and upward moving gases. The barrier minimises infiltrating water:

- directly by blocking water; and
- indirectly by promoting drainage in the overlying layers.

111. The primary design criteria for the impermeable barrier layers are:

- they shall comprise as a minimum of a composite of geomembrane liner and mineral capping layer;
- the mineral capping layer will be bentonite enhanced soils (BES);

- athey shall continue to serve its intended function as well as possible after the polymers degrade;
- the mineral capping layer shall have a minimum thickness of 600mm;
- the mineral capping layer shall have an as-constructed permeability not exceeding 1x10-10 ms-1;
- the components of the impermeable layers shall be suitably strain-tolerant and shall be capable of resisting the long-term deformations of the cap to the extent practicable; and
- the impermeable layers shall be located at a depth below maximum frost penetration depth.

5.3.9 Profiling Fill

112. The primary function of the profiling fill is to create the required profile for the cap. This will ensure adequate cross-falls for drainage and stability. In particular, the shape of the cap will minimise infiltration (via rainfall run-off and effective drainage) even in the long term when the performance of the low permeability components of the cap has been degraded.

113. The thickness of profiling fill will vary across the cap to suit the profile, but will be a minimum of 1 m. It also has a particular purpose to spread the influence of differential settlements on the performance of the cap. The maximum thickness will be about 7 m at the highest, central area of the cap profile.

114. Additional profiling material has been included over Vault 8 to accommodate for uncertainties associated with voids present in some containers.

115. The profiling fill will:

- utilise excavated materials from construction of future works where possible or imported fill where necessary;
- be completed to a defined specification;
- limit effects of differential settlement on the cap by spreading movements; and
- provide suitable foundation for the cap construction and performance.

116. The profiling fill can accommodate all site-won materials from future development works and ensure that such materials do not have to be taken off-site. It may include a wide range of imported materials maximising the re-use of wastes provided these meet the site contamination and engineering suitability criteria (this may include a proportion of Very LLW). The engineering requirements entail the material being suitable for use as engineered fill to industry standard specification. It will be managed and compacted in layers accordingly. Specifications will be kept as open as possible to make best use of site-won materials, as excavated for construction of the vaults.

5.3.10 Gas Collection and Control

117. The cap is designed to control and collect gases to ensure that gases generated within the waste body can be safely dissipated without harm and without risk to the integrity or stability of the overlying capping system and in particular the resistive barrier layers.

118. The gases include the normal range of landfill gases, predominantly carbon dioxide and methane and some trace gases associated with decomposition of the wastes, which is expected to continue over the next 200 to 400 years, but possibly longer. For the LLWR, the gases also include small quantities of radioactive gases, notably radon, trace carbon 14 labelled gases and tritium. It is noted that carbon dioxide and radon are heavier than air and so may tend to move downwards rather than upwards through the venting system.

119. Although the rate of gas generation is anticipated to be relatively low compared with a landfill for municipal waste, it is proposed to collect and vent them to prevent build-up beneath the cap, consistent with normal landfill practice.

120. The proposed cap venting arrangement is designed to prevent infiltration by a 'mushroom' overlap system of the impermeable barrier layers, whilst retaining the facility to vent gases (see ESC Drawing D-05 in Volume III).

5.4 Cap Construction and Profile

121. The capping works will involve a total of some 1.29M m3 of earthworks materials comprising:

- 260 000 m3 BES;
- 130 000 m3 sands (various grades);
- 380 000 m3 gravels (various grades);
- 260 000 m3 hard rock;
- 260 000 m3 soils - vegetation support layers.

The capping works will also require 1,090,000 m3 profiling fill.

122. Most of the excavated material from vault construction will be used either for profiling fill or for other capping layers if suitable. Whilst it is desirable to use excavated materials immediately, it is most likely that excavated materials will be taken initially to stockpiles, with some sorting. The excavation works for the vaults will produce about 270,000 m3 of cut material (after allowing for materials re-used for vaults construction).

123. The balance, i.e. fill which may have to be imported, is therefore 820,000 m3. Specifications will be kept as open as possible to make best use of local materials, as excavated for construction of the vaults. Whilst some of the local clay may be suitable for use in the cap, and this will be used where available, BES formulation using mainly imported raw materials is generally proposed.

5.5 Cut-off Wall

124. It is proposed to extend the existing cut-off wall around the vaults from existing ground level down to 2 m below base of each vault (underside of BES impermeable liner).

125. The cut-off wall is a key component (along with the proposed cap) of the containment engineering. The main function of the cut-off wall is to minimise shallow groundwater flow into the vaults and trenches.

126. The cut-off wall also has a contingency role in providing reassurance against the possibility of a near-surface release close to the facility in the unlikely event of early cap failure (leading to possible saturation of the waste column), or as a result of preferential pathways for leachate migration that might arise from the waste stacking. The cut-off wall will be keyed into the perimeter of the cap, to preclude the possibility of such releases.

127. Cement-bentonite slurry, with some granulated blast furnace slag (GBFS) as a cement replacement, is to be used, as it is generally considered to provide the best balance of strength and low permeability for cut-off walls.

128. The excavated materials will be kept on site and used in the cut-off wall construction. Only limited quantities cement, bentonite and GBFS will need to be imported.

5.6 Construction

5.6.1 General

129. For the LLWR the construction and operational phases will last in parallel until 2045.

130. The proposed construction is based on well-established engineering practice and is expected to be relatively straightforward, notwithstanding that it involves substantial engineering operations. The various technologies are all well established and tried and tested, as are the proposed construction procedures generally. Most have already been used for previous works on the site. LLWR has experienced teams, as have a suitable range of experienced contractors. Lessons learnt will continue to be incorporated in future specifications and works.

131. The engineering design includes plans for corrective action to deal with foreseeable geological or geotechnical problems which might arise during construction.

5.6.2 Ancillary Works

132. In order to construct the proposed facility, there is a requirement to undertake ancillary works that are described below and included in the overall assessment. Upgrades will be carried out to the site infrastructure to support the construction of this facility and the transport of construction materials around site. Some of the facilities (e.g. the batching plants) will be temporary and will be removed at the end of each phase of the construction period, whereas other facilities will be retained for use during the whole construction period (stockpile areas for example).

5.6.3 Contractors' Compound

133. The contractors' compound will be located adjacent to the railway siding (Figure 3.5 in Volume II of the ES) and will comprise the bulk materials storage area and batching plant area. Contractors' offices/cabins, welfare facilities, the required material testing facilities, site roads, parking, lay-down areas and site drainage, including settlement tanks will also be provided in this area.

134. The contractors' compound will be in periodic use during the development.

135. The exact layout of the compound will be agreed with the appointed contractor.

5.6.4 Stockpiles

136. The locations of three proposed stockpile areas are shown on (Figure 3.5 in Volume II of the ES).

137. Stockpile area A is located in the south-west corner of the trenches. Individual stockpiles for the various capping materials may be placed within stockpile area A. Material may be stockpiled up to 4 m height in areas that have no profiling fill and to 3m height in areas where profiling fill has been placed. No stockpiles may be placed in areas that have been capped. It is assumed that stockpile area A will be used for capping materials, excluding surface soil and BES.

138. Stockpile area B is within the area set aside for vaults that are yet to be constructed. Prior to demolition of the magazines, the area around them may be used. Stockpile area B will be used for material excavated during vault construction, which may be stockpiled up to 4 m height.

139. Stockpile area C is to the south of the vaults. Stockpile area C will be used for capping materials which may be stockpiled up to 4 m height.

5.6.5 Site Infrastructure

140. As the LLWR is already an operational waste disposal and storage facility, much of the necessary site infrastructure is well established. Site infrastructure upgrading will include (if required):

- necessary road building and maintenance;
- installation of lay-bys and passing places;
- upgrading of drainage; and
- installation and upgrading of services.

141. The transport of construction materials around the site will be undertaken in accordance with the internal transport system and which will be directed by clear signage.

5.6.6 Drigg Stream Diversion

142. The northern part of the route of the Drigg Stream flows through the area proposed for future vault construction (Figure 3.3). This part of the stream will be diverted during Phase 2 (with the new channel having been constructed in Phase 1) and relocated to the perimeter of the cap over the disposal area, re-joining its original course north of the confluence with the East-West Stream.

143. The relocated stream will form part of the cap perimeter drain on the northern and western sides of the vaults and will be an open ditch of a capacity designed to accommodate peak flows and also suitable for the frequently occurring low flows. It has been specifically designed to support and provide habitat for flora and fauna.

144. The diversion of Drigg Stream is required to ensure that the construction of Vaults 9A - 11 requires the minimum footprint to achieve the required capacity and so that the area used for LLW disposal within the overall Repository site is minimised.

5.7 Construction Sequence

5.7.1 Site Condition at Commencement

145. The trenches are covered by an interim cap and surface runoff is captured in the interim trench cap perimeter drainage.

146. Vaults 8 and Vault 9 are open and operational.

147. There are two stockpiles of material won from the construction of Vault 9 – Mound 1 and Mound 2 (Figure 3.3).

148. Initial preparatory works are required prior to the permanent capping of the vaults and trenches.

Phase 1 Site Preparation (2016 - 2020)

Phase 1a

149. The existing screening planting along the east of the site will be progressively cleared and replaced with engineered material to form the shoulder of the final cap, along the eastern and northern edges of the trenches. The cap shoulder along the eastern boundary will provide visual screening of the development from views from nearby residential properties to the east of the proposed development.

150. Loss of the perimeter woodlands is a by-product of the necessary engineered capping of the vaults and trenches. The very long-term environmental performance required of such a cap requires a multi-layered design of significant thickness (3 m). As the cap cannot finish with a vertical face at the outside edge of the trenches or vaults, construction of the peripheral landform is necessary to merge the cap into the existing topography. As the existing perimeter woodlands are located very close to the boundary of the trenches and boundaries of the existing and proposed vaults, it will be necessary to remove the planting on the northern and eastern sides of the site in Phase 1 to allow construction of the peripheral landform. This landform acts both as a visual screen for future capping activities to views from the north and east and can be replanted immediately to provide long-term screening of future phases.

151. Material will be imported to fill voids in Vault 8 (single size rounded aggregate and possibly to form the running surface over Vault 8 to allow the further placement of waste in containers on top of Vault 8 prior to the installation of the final cap and to aid installation of the capping materials (Ministry of Transport (MOT) type 2).

152. A haul road will be installed on the trench cap, to the west of the crest of the existing interim trench cap.

153. A new perimeter drain will be constructed around the toe of the final cap, designed to accommodate surface run-off from the final cap. This will drain into a new settlement/attenuation lagoon linked to the existing course of the Drigg Stream to the south of the area for vault construction. The lagoon an also be used for treatment of run-off water if required.

Phase 1b

154. Material from onsite stockpiles Mound 1 and Mound 2 will be used to form the profiling fill layer and surcharging layer over the northern portion of the trenches adjacent to Vault 8. Interim edges to the cap layers will be profiled at 1 in 4.

155. Screening vegetation using native species will be planted along the capped shoulder areas to provide additional visual screening as it matures. The area of planting will be extended along the eastern boundary to the railway sidings.

156. The north eastern section of the existing interim trench cap drain will be covered by profiling fill and is therefore not usable. The interim trench cap drain adjacent to Vault 8 and Vault 9 will be replaced with a temporary drain that flows south. Temporary drainage will be provided at the toe of any temporary 1 in 4 slopes at the edges of the profiling fill (as a minimum), connected to the interim trench cap perimeter drain.

Phase 1c

157. Additional profiling fill materials will be brought in by train and placed in Stockpile A (over the trenches).

158. Waste in HHISOs will be transferred from Vault 9 to Vault 8 (Higher Stacking).

Phase 2 – Cap Vault 8 and Construct Vaults 9A and 10 (2019 - 2023)

159. Phase 2 commences after Vault 8 is available for capping.

Phase 2a

160. BES and concrete batching plants will be installed within the Contractor's Compound.

161. The existing cut-off wall will be extended along the northern edge of the cap and the western edge of Vault 8. As with all phases of cut-off wall construction, all materials are brought in by train except for bentonite and concrete powders which are brought in by road.

162. The secant pile wall will be installed along the length of Trench 3. Material excavated during installation of both walls will be placed in Stockpile B.

163. The section of Drigg Stream adjacent to the vaults will be diverted along the western edge of the site and will discharge into the existing course of the Drigg Stream via the settlement/attenuation lagoon.

164. Profiling fill will be placed over Vault 8 taken from the surcharge on the adjacent trenches supplemented by material from Stockpile A if necessary.

165. Capping materials, directly imported and taken from stockpiles, will be placed over Vault 8, the cap shoulder and the adjacent parts of trenches forming the final engineered cap. Interim edges to the cap layers will be profiled at 1 in 4 and temporary drainage provided at the toe.

166. Restoration planting will take place on Vault 8, the cap shoulder and adjacent trenches.

167. The area of Vaults 9A will be excavated and the material reused as profiling fill over the adjacent trenches supplemented by material from Stockpile A. The lining system for Vault 9A will be then constructed.

Phase 2b

168. The area of Vault 10 will be excavated and the material reused as profiling fill, and surcharging material over the adjacent trenches supplemented by material from Stockpile A. The lining system for Vault 10 will be then constructed.

Phase 3 – Cap Vault 9 and Construct Vault 11 (2023 - 2030)

169. Phase 3 can commences after Vault 9 (including Vault 9A) is available for capping.

Phase 3a

170. Capping materials and profiling/surcharging materials will be imported by train.

171. The cut-off wall along the west of the site will be extended along edge of Vault 9A.

172. The existing screening planting adjacent to Vault 9A will be cleared and profiling fill over Vault 9/9A taken from surcharge on adjacent trenches supplemented by material from Stockpile A if necessary.

173. Capping materials, directly imported and taken from stockpiles will be placed over Vault 9/9A, the cap shoulder and the adjacent trenches, forming the final engineered cap. Interim edges to the layers are profiled at 1 in 4 and temporary drainage will be provided at the toe.

174. Restoration planting will take place on Vault 9, the cap shoulder and adjacent parts of the trenches.

Phase 3b

175. The area of Vault 11 will be excavated and the material reused as profiling fill and surcharge material over the adjacent trenches supplemented by material from Stockpile A. The lining system for Vault 11 will be then constructed.

Phase 4 – Cap Vault 10 (2030 - 2032)

176. Phase 4 can commence when Vault 10 is available for capping.

177. Capping materials and profiling/surcharging materials will be imported by train.

178. The cut-off wall along the west of the site will be extended along edge of Vault 10.

179. The existing screening planting adjacent to Vault 10 will be cleared and profiling fill over Vault 10 taken from surcharge on adjacent trenches supplemented by material from Stockpile A if necessary.

180. Capping materials taken from stockpiles will be placed over Vault 10, the cap shoulder and the adjacent trenches. Interim edges to the cap layers are profiled at 1 in 4 and temporary drainage will be provided at the toe.

181. Surcharge material will be placed over the remainder of the trenches.

182. Restoration planting on Vault 10, cap shoulder and adjacent parts of the trenches.

Phase 5 – Cap Vault 11 and Close Site (2045 - 2051)

183. Phase 5 commences after Vault 11 is full.

184. Within this phase the construction of the cut-off wall along edge of Vault 11 and around the south of the development is completed to link into the existing cut-off wall along the eastern boundary of the trenches.

185. The area of the final cap will be cleared, including demolition of offices and other buildings.

186. Capping materials and profiling material will be imported by train.

187. The existing screening planting adjacent to Vault 11 will be cleared and profiling fill over Vault 11 taken from surcharge on adjacent trenches supplemented by material from Stockpile A if necessary.

188. Profiling material will be placed over the remainder of development area in preparation of the installation of the final cap.

189. The final cap will be installed over Vault 11, the cap shoulder and the remainder of the trenches. The landform including a new perimeter drain around the toe of the final cap, designed to accommodate surface runoff from the final cap linked to the attenuation pond will be completed.

190. This will be followed by the completion of restoration planting over Vault 11, cap shoulder, remaining trenches and completed landform.

Access and Traffic Generation

191. A major aim of the transport strategy for the future development and capping of the site is to utilise the existing sidings and rail reception facilities to maximise the volume of construction materials delivered to the LLWR by rail.

192. Due to the amount of material to be imported, imports and replenishment of tockpiles may take place between defined construction phases.

193. For each phase, heavy duty construction plant, (it will then remain on site for the duration of use), will be brought in by road. All construction and capping materials will

be brought in by train except for bentonite and concrete powders, which will be brought in by road.

194. Internal haul routes for HGV movements include a haul road to the east of the area for future vault construction to obtain access to the cap and stockpiles A and B. This haul road is located beyond the crest of the interim trench cap landform in order to minimise the visibility of HGV movements onto the cap.

195. Small scale imports of equipment or access for plant maintenance etc. will be by road using the main site access.

196. Construction workers will use the road access but will be encouraged to travel to/from site in mini-buses or shared cars. As with Vault 9 construction, a park-and-ride minibus scheme will be available.

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6 Planning Policy Context

197. Policy and guidance relevant to the determination of the application includes those documents comprising the development plan, National Planning Policy Framework ('the Framework') and National Planning Practice Guidance (PPG), together with documents specific to the management of LLW which are to be taken as planning policy for the industry3. A summary of these documents is provided below.

6.1 Planning Policy

6.1.1 The Development Plan

198. Section 38(6) of the Planning and Compulsory Purchase Act (2004) refers to the development plan as a whole and states that:

'If regard is to be had to the development plan for the purposes of any determination to be made under the Planning Acts, the determination must be made in accordance with the plan unless material considerations indicate otherwise.'

199. This section is in addition to S70(2) of the Town and Country Planning Act (1990), which requires a local planning authority, in determining a planning application, to have regard to the development plan insofar as it is relevant as well as to other material considerations.

200. The development plan in this case comprises:

- the Cumbria Minerals and Waste Development Framework: Core Strategy and Generic Development Control Policies DPD;
- the Copeland Local Plan 2013 - 2028: Core Strategy and Development Management Policies; and
- the saved policies of the Copeland Local Plan 2001 – 2016.

201. The Cumbria Minerals and Waste Development Framework: Site Allocations DPD was adopted in January 2011 but has since been subject to a successful legal challenge and has been quashed. It does not, therefore, form part of the development plan.

6.2 Cumbria Minerals and Waste Development Framework

202. The adopted documents that make up this framework comprise the Core Strategy (CS) and the Generic Development Control Policies DPD.

[3] PINS ref. APP/K2800/A/10/2126938, Paragraph 7.16 of Inspector's Report in respect of East Northants Resource Management Facility at King's Cliffe

6.2.1 Core Strategy

Sustainable Location and Design

203. CS Policy 1 requires that proposals demonstrate how their design takes account of energy management, environmental performance and carbon reduction.

204. Developments must also minimise transport requirements through their location unless there are other environmental/sustainability considerations that would outweigh doing so. Waste production arising from development should also be minimised.

205. It includes a requirement for all waste developments that exceed 1,000 sqm to provide at least 10% of their energy requirements from decentralised and renewable or low carbon energy supplies. It is not considered that these provisions apply to the proposed development as no floorspace is to be constructed.

Economic Benefits

206. The economic benefits of new developments should be demonstrated in accordance with CS Policy 2, including the direct and indirect creation or safeguarding of jobs and the ability to support other industries. Other regeneration and development initiatives should not be prejudiced by the development.

Nuclear and Waste Related Developments

207. CS Policy 3 requires that large national or regional waste management facilities should provide packages of community benefits to help offset the impacts of hosting such facilities.

208. CS Policy 12 is a unique policy within the CS in that it deals only with one specific site (the LLWR). The policy states that:

"Provision will be made for the Low Level Repository, near Drigg to continue to fulfil a role as a component of the UK's radioactive waste management capability. Proposals for very long term storage or disposal of waste will have to demonstrate that they are feasible in relation to the long term integrity of the site with regard to sea level rise and coastal erosion. Proposals for additional storage or disposal facilities will have to demonstrate that they are within the site's radiological capacity."

209. The policy is therefore supportive of the continued national role of the LLWR. The reference to "provision" being made would suggest that the WPA intends generally to be supportive of any proposal to construct additional storage and/ or disposal capacity at the site since this is the only way in which the WPA as Waste Planning Authority could make any provision. The qualification in the policy is that proposals for very long-term storage and disposal need to be shown to be feasible in relation to the long-term integrity of the site with regard to coastal erosion and sea-level rise and that the proposed additional capacity is within the radiological capacity of the site.

210. The Core Strategy does not set out any definition as to what "feasible" means in relation to the policy but case law has established both that Policy statements must be interpreted objectively in accordance with the language in its proper context and according to what is actually written rather than what may have been intended and that a planning authority must proceed on a proper understanding of the development plan

(see for example: Trafford BC v Secretary of State for Communities and Local Government Queen's Bench Division (Administrative Court), 24 February 2014([2014] EWHC 424 (Admin)).

6.2.2 Generic Development Control Policies DPD

211. The Cumbria Minerals and Waste Development Framework Generic Development Control Policies DPD (GDCDPD) contains a suite of policies that are applicable to all minerals and waste applications in the County, as summarised below.

Traffic and Transport

212. Policy DC1 requires proposals to be located where they are well related to the strategic route network and/or have potential for rail or sea transport and sustainable travel to work, and are located to minimise 'minerals and waste road miles'.

Environment

213. Policy DC2 requires that proposals should demonstrate that there will be no significant degradation of air quality from dust and emissions, and that public right of ways or paths are not adversely affected, that carbon emissions have been minimised and that issues of ground stability have been considered and addressed.

214. Policy DC13 requires that an assessment should also be made of cumulative environmental impacts in light of other land uses in the area.

215. Policy DC13 is concerned with flood risk and requires developments to be located in accordance with the sequential test as set out in Planning Policy Statement 25 (since superseded by the Framework and associated guidance). Developments should be located, where possible, in the zone of lowest probability of flooding. The policy confirms that hazardous waste management facilities may be appropriate in areas of medium probability (Zone 2).

216. The policy provides for exceptions to be made to this general approach only in circumstances where the wider sustainability benefits of the development outweigh the flood risk and contribute to sustainability or the development is on brownfield land and there are no reasonable alternative sites on developable brownfield land. In either case there is a requirement that the flood risk assessment for the proposal should demonstrate that the development will be safe without increasing flood risk elsewhere and, where possible, will reduce flood risk overall.

217. Policy DC14 states that development must not have an unacceptable quantitative or qualitative effect on the water environment including surface and ground water resources. Proposals that minimise water use and include sustainable water management will be favoured.

Design and Landscape

218. Policy DC12 states that proposals should be compatible with the characteristics and features of the landscape. Adverse impacts on the natural and historic environments should be avoided. The policy also advises that the following considerations are also relevant:

- landscape Character Assessment should be used to assess the capacity of

landscapes to accept development;

- the effects on locally distinct features, scale in relation to landscape features, public access and community value of the landscape, historical patterns and attributes, and openness, remoteness and tranquillity;

- ensuring high quality design of modern waste facilities to minimise their impact on the landscape, or views from sensitive areas, and to contribute to the built environment; and

- directing minerals and waste development to less sensitive locations where this is possible and preventing significant adverse impacts on the principal local landscape characteristics.

6.2.3 Copeland Local Plan 2013-2028: Core Strategy and Development Management Policies

Strategic Policies

219. The overall strategic development principles are set out in Policy ST1 and relate to economic, social and environmental sustainability. The policy gives support to the development of energy infrastructure and achieving diversity in jobs. Environmental sustainability is to be achieved through compliance with a number of criteria relating to minimising carbon emissions and maximising energy efficiency (including by minimising the need to travel and the provision of sustainable transport infrastructure), minimising waste and avoiding adverse impacts on existing natural features. The borough's assets are to be protected, enhanced and restored, and quality places are to be created.

220. The policy confirms that applications which accord with these principles will be approved without unnecessary delay, unless material considerations indicate otherwise.

221. Policy ST2 sets out the spatial development strategy. This advises that development beyond settlement limits is acceptable where it comprises essential infrastructure to support energy development and other infrastructure that requires a location outside settlement limits.

222. Development within the nuclear sector is dealt with through Policy ER1. This confirms Copeland's commitment to work with the LLWR site operator in the development and management of waste facilities and associated infrastructure.

Development Management Policies

223. Policy DM1 requires proposals for development related to the nuclear sector to conform with a number of principles, including:

- being developed in consultation with community and key stakeholders;

- the provision of a strategy for the construction and long term management and safety of the site where proposals involve the use, storage or processing of radioactive material;

- involving the WPA and key stakeholders in relation to any EIA undertaken.

Particular attention should be given to the residual impacts; and

- an appropriately scoped, scaled and phased package of measures to mitigate adverse impacts of the development.

224. Development at the LLWR is subject to Policy DM5. This affirms the WPA's commitment to work with the operator of the LLWR and seeks to ensure that:

- operations remain within existing boundaries;
- no non-waste management-related operations are introduced on the LLWR at Drigg;
- proposals for new facilities are submitted with long-term management plans to ensure that harmful effects are minimised and physical environmental impacts are mitigated; and
- new facilities include the provision of adequate infrastructure; involve and secure the support of the local community and stakeholders; and include measures to meet local community needs and to mitigate the adverse effects of the proposed development on the social and economic wellbeing of the community.

225. The DPM document also includes policies relating to transport implications and vehicular access (Policy DM22), protection of nature conservation sites, habitats and protected species (DM25), landscaping (DM26) and built heritage and archaeology (DM27).

6.2.4 Copeland Local Plan

226. The Copeland Local Plan was adopted on 6th June 2006 and a number of policies remain applicable. None of these policies is considered to be relevant to the development proposed in the planning application.

6.3 Weight to be given to the Development Plan

227. It is considered that, for the purposes of this application, the policies contained within the development plan and summarised above are up to date and are consistent with the National Planning Policy Framework. They can therefore be afforded significant weight in the determination of the application.

6.4 National Planning Policy Framework

228. The National Planning Policy Framework (the Framework) does not include specific waste policies but local authorities are expected to have regard to its policies so far as these are relevant.

229. The overriding principle of the Framework is to achieve sustainable development. It sets out a clear presumption in favour of sustainable development and directs local

planning authorities to approve development proposals which accord with the development plan without delay.4

230. The Framework sets out a number of the principles that should underpin the planning system. Amongst these are that the system is to '*proactively drive and support sustainable economic development to deliver…infrastructure…that the country needs' and to 'objectively identify and then meet the…development needs of an area*'.

231. The Framework sets out national policy on a range of issues such as supporting economic growth and the rural economy and on a range of technical / environmental aspects of development including, sustainable transport, conservation and enhancement of the natural environment and the challenge of climate change, coastal erosion and coastal change.

232. Of particular relevance to the current application are the sections on meeting climate and coastal change (Section 10) and conserving and enhancing the natural environment (Section 11). These policies:

- Encourage new development to avoid increased vulnerability to the range of impacts arising from climate change. When new development is proposed in vulnerable areas, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure.
- Encourage local authorities to identify any area likely to be affected by physical changes to the coast as a Coastal Change Management Area.
- Encourage the re-use of previously developed land.
- Give great weight to conserving landscape and scenic beauty in National Parks.
- Encourage local planning authorities to conserve or enhance biodiversity by avoiding development that causes significant harm unless adequate mitigation or compensation can be provided.
- Normally prohibit development which is likely to have an adverse effect on a Site of Special Scientific Interest. An exception may be made where the benefits of the development clearly outweigh the impacts it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national networks of SSSIs.
- Confirm that potential Special Protection Areas, possible Special Areas of Conservation and listed or proposed Ramsar sites should be given the same protection as European sites.
- Underline the need for LPAs to focus on whether the development proposed is an acceptable use of the land and on the impact of the use and that LPAs should assume that environmental controls imposed by other regimes will operate effectively.

[4] Paragraph 119 notes that the presumption in favour of sustainable development does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered or determined.

6.5 National Planning Practice Guidance

233. The National Planning Practice Guidance (NPPG) provides guidance on a number of issues including climate change (including adaptation and mitigation), coastal change and waste (including implementation of the waste hierarchy).

6.6 Other Policy Documents

234. Although not formally planning policy documents, a number of the strategy and guidance notes concerning the management and disposal of radioactive wastes, which were discussed in Section 4 of this Statement, are relevant to the consideration of the proposals and need to be taken into account by the WPA in the determination of the planning application. A summary of the key points arising out of these documents is set out below.

6.6.1 Policy for the Long Term Management of Solid Low Level Radioactive Waste in the United Kingdom

235. The 2007 Policy Statement ('the UK LLW Policy') covers all aspect of the generation and management of solid LLW and applies to waste producers and managers, the NDA, regulatory bodies, waste disposal facility operations and planning authorities.

236. The Policy Statement requires waste managers and all nuclear licensed sites to plan for the management of LLW through management plans prepared to a suitable level of detail, as required by the relevant regulatory bodies. Management plans must be based on an assessment of all practicable options for the long term management of LLW.

237. LLW managers are encouraged to manage their waste in accordance with the waste hierarchy and principles set out in other UK waste strategy documents so as to minimise waste arisings. However, the Policy is clear that, following application of the hierarchy, there will be some remaining waste for which disposal will be necessary and that such waste will need to be disposed of in an appropriate engineered facility with no intention that it should be retrieved. For this final disposal the Policy Statement envisages:

'the use of centralised facilities, such as the Low Level Waste Repository (LLWR) near Drigg in Cumbria, or any similar future facility, may be the appropriate point of disposal for much LLW'

238. The Policy Statement advises that the potential effects of climate change and risks to human health should be taken into account in the management of LLW.

6.6.2 UK Nuclear Industry LLW Management Plan

239. Objective 8 of the UK Nuclear Industry LLW Management Plan (December 2009) requires that the closure engineering of the LLWR be optimised by designing a more innovative and efficient cap that not only fully performs against the ESC requirements but also integrates the design process with future decommissioning proposals and planned waste arisings. This and the other objectives of the LLW Management Plan

have informed the UK Strategy process and the development of the updated operational strategy for the LLWR site.

6.6.3 Developed Operational Strategy for the Low Level Waste Repository

240. Section 5 of the Developed Operational Strategy (December 2010) sets out the proposed site operations and works to provide for continued LLW assured disposal capacity in the long term, comprising the use of Vault 9 for disposal and a programme to deploy the proposed future vaults (Vault Nos. (9a and 10 -14), together with the use of optimised closure engineering and a revised cap design to satisfy the long-term safety requirements.

6.6.4 The UK Strategy for the Management of Solid Low Level Radioactive Waste from the Nuclear Industry

241. The final UK Strategy resulting from the LLW Strategic Review (published in August 2010) seeks to provide "*a high level framework for the continued capability and capacity for the safe, secure and environmentally responsible management and disposal of LLW in the UK, for both the nuclear and non-nuclear industries"*.

242. The evidence base, prepared in 2009, demonstrated that, over the next 80 years, the UK is expected to generate 2.4 million cu. m. of LLW and identifies that, even with the application of the waste hierarchy, UK arisings will significantly exceed planned capacity at the LLWR. This assessment was carried forward into the UK Strategy.

242. The UK Strategy is therefore based on the three central themes of;

- the application of the Waste Hierarchy;
- making the best use of existing LLW management assets; and
- the need for new fit-for-purpose waste management routes.

243. Notwithstanding the development of new waste treatment routes and processes and a greater application of the waste hierarchy in LLW management, the continuing need and role of the LLWR in providing an assured route for LLW disposal remains critical and must be prioritised. This is made clear in the UK Strategy:

'The UK's only management route for certain LLW, and the only facility in the UK that can accept a wide range of LLW from numerous waste producers, is the Low Level Waste Repository (LLWR). Its continued availability is considered vital by both nuclear industry and non-nuclear industry LLW producers.'

244. The deployment of additional disposal capacity at the LLWR and the measures to prolong its operational lifetime are, therefore, central to the successful implementation of the UK Strategy for the Management of Solid Low Level Radioactive Waste from the Nuclear Industry. This consequently, is the fundamental purpose and objective of the proposed planning application.

6.7 Emerging Planning Policy

6.7.1 Draft Cumbria Waste and Minerals Local Plan

245. The WPA undertook consultation on the preferred options for its draft Minerals and Waste Local Plan in spring 2015. It is at a relatively early stage of preparation and, in accordance with paragraph 216 of the Framework, little weight can be placed on it particularly as there are unresolved objections.

6.8 Summary

246. The development plan is considered to be up to date and significant weight can be placed on the relevant policies. These policies confirm in principle support for the role of the LLWR and the development of additional storage or disposal capacity (subject to complying with specified criteria).

247. National LLW policy is highly material in the determination of the application. The key provisions and objectives of national LLW policy confirm that:

- disposal to an engineered facility with no intent to retrieve, should be the end point for all higher activity solid LLW (above 200 Bq/g) requiring multi-barrier containment that remains following application of the waste hierarchy;
- as the only UK repository that can accept this type of solid LLW, the LLWR, is a key national asset and its continued availability is central to the UK Strategy;
- the forecast volume of UK solid LLW arising from 2010 to 2130 will exceed the remaining (non-committed) disposal capacity at the LLWR; and
- optimised use should be made of the LLWR and its remaining disposal capacity to prolong the life of the facility subject to the application of Best Available Techniques (BAT) and to ensure continued capacity for the long term.

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7 Material Planning Considerations

248. Section 38(6) of the Planning and Compulsory purchase Act (2004) refers to the development plan as a whole and states that:

'If regard is to be had to the development plan for the purposes of any determination to be made under the Planning Acts, the determination must be made in accordance with the plan unless material considerations indicate otherwise.'

249. This section is in addition to Section 54A of the Town and Country Planning Act 1990, and is a reiteration of the presumption in favour of development that accords with the development plan. It follows that the first issue to consider is whether the proposals are in accordance with the objectives, policies and proposals of the development plan as a whole, and then to determine whether there are any other material considerations that need to be weighed in the decision making process.

250. The adopted development plan for the LLWR comprises the Cumbria Minerals and Waste Development Framework 2010 and the Copeland Local Plan 2006. Having regard to the objectives, policies and allocations of the development plan, the following key planning issues are identified and need to be taken into account in the determination of the application:

- Whether the proposals are acceptable in principle, having regard to the development plan and national policy for the long term management of solid low level radioactive waste, as reflected in the UK Strategy for the Management of Solid Low Level Radioactive Waste from the Nuclear Industry;
- Whether the development is considered acceptable in terms of its likely environmental effects; and
- Whether there are any other material considerations relevant to the determination of the application.

251. These issues are considered in the remaining sections of this planning statement and accompanying application documents.

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8 The Principle of Development

8.1 Conformity with National Policy for the Long-term Management of Solid Low Level Radioactive Waste in the UK

252. National policy and strategy for the long-term management of solid low level radioactive waste in the UK has been developed and significantly advanced since the 2007 Policy Statement was published. A comprehensive, clear and up-to-date adopted national policy is now in place. This confirms;

- that the Low Level Waste Repository is a central component of the delivery of UK policy and LLW Strategy;
- that the LLWR is a key national asset for LLW producers and the only one of its kind in the UK for the safe disposal of certain categories of LLW; and
- the need to ensure continued capability and assured disposal capacity for the long term at the LLWR, by extending its available and planned remaining capacity and thereby extending the lifetime of the facility.

253. The proposals for the construction of new vaults to provide additional disposal capacity on the site will deliver the disposal capacity required in order to meet expected needs over the period to 2045 and to ensure that the NDA and LLW Repository Ltd can continue to operate the facility in accordance with the statutory duty. The capping proposals set out in this planning application provide the necessary reassurance as to the final closure of the LLWR in line with the ESC whilst safeguarding the opportunity for the construction of additional vaults (12-14) should these be required to meet disposal needs beyond 2045.

254. The approval of the planning application and subsequent delivery of these works is fundamental to the successful implementation of key parts of the UK LLW policy and the LLW Strategy. At a national level, the proposals are therefore acceptable in principle.

8.2 Meeting UK Need

255. The three aims and objectives set out in the UK Strategy for the Management of Solid Low Level Radioactive Waste, are:

- the application of the Waste Hierarchy;
- making the best use of existing LLW management assets; and
- the need for new fit-for-purpose waste management routes.

256. These aims are not prescribed in any particular order of priority nor provided as choices. Rather they must be undertaken simultaneously (as circumstances permit) to meet the overriding objective of the UK Strategy, which is to maintain a cost-effective

service and continuously available capacity for the safe and assured disposal of the UK's low level waste.

257. The evidence base for the UK Strategy identified a clear requirement for the creation of additional capacity at the LLWR based on a comparison of the (then) projected scale of UK LLW arisings of 2.4 million cubic metres, with the remaining capacity at the site of 0.7 million cubic metres. However, it was acknowledged during the pre-application discussions with the WPA that this evidence base is now dated and that an updated assessment of need was required. This has been undertaken by LLW Repository Ltd and is set out in the report entitled "Site Optimisation and Closure Works: Need for Disposal Capacity at LLWR" produced in January 2015 (document ref. RP/340737/PROJ/00033 Version 2), which is included as Appendix 4 to this Statement. The following paragraphs set out a summary of this report and updated assessment of need.

8.2.1 Objective

258. The report seeks to present projected fill dates for the existing and potential future disposal vaults at LLWR, based on the latest available information, and to discuss the uncertainties with regard to the projected dates.

8.2.2 Background

259. The report notes that the ESC, which was submitted to the Environment Agency in May 2011, assesses two different scenarios with regard to the physical extent of the Repository; one relating only to the Reference Disposal Area (RDA) and one covering an Extended Disposal Area (EDA) including other parts of the wider site area.

260. The RDA Repository comprises Trenches 1 - 7 and Vaults 8 – 14, which the ESC estimates would have the capacity to accept all of the UK's LLW arisings up to 2080, subject to a number of future decisions on the future management of LLW, including the extent to which waste segregation and treatments are applied.

261. The EDA Repository would include all of the existing and potential capacity within the RDA and additional vaults (Vaults 15- 20), which could be constructed to the south of the trenches and Vaults 8 - 14. This assessment was undertaken to investigate whether all of the LLW in the UK's Radioactive Waste Inventory (UKRWI) requiring disposal in a contained vault could safely be disposed of at the site (this assessment excludes very low level waste and waste for which an alternative route is available or planned). The UKRWI predicts arisings up to 2130 and taking all of the waste arisings requiring vault disposal would extend the life of the LLWR to that same date. Much of the capacity in the additional vaults in the EDA Repository would be required for the safe disposal of the "final stage" decommissioning wastes from the UK's existing gas cooled reactors.

262. The UKRWI is the best available source of data on future waste arisings in the UK as each waste producer is required by the Government to provide detailed information on the nature and volumes of their predicted arisings.

8.2.3 The PIER Model

263. An inventory model called PIER (Projected Inventory Evaluation Routine) was used in the preparation of the ESC to calculate the distribution of waste materials between

different vaults and to calculate the fill dates of each vault. The ESC was based on the 2007 UKRWI but the PIER model has been updated for the purposes of the new assessment, based on the 2013 UKRWI and on experience gained of the effects of waste diversion and treatment which has been gained since the ESC was finalised in 2011.

264. The PIER model provides estimates of the volumes of primary and secondary wastes disposed of to LLWR each year, taking account of waste processing, diversion and treatment, and of the quantities of radionuclides disposed of to LLWR each year, so that this information can be taken into account in the assessment.

265. The PIER model includes all material identified as LLWR unless it has a clear alternative management or disposal route and assumes that all very low level waste (VLLW) and similar low activity LLW streams will be diverted to alternative landfill facilities. Using UKRWI as its main input, PIER then makes assumptions about reductions in the physical volume of wastes resulting from compaction, or incineration, metal treatment or metal melting (having regard to the capacity of the various facilities that provide these treatment options). PIER processes the waste data based on the following steps:

- segregation of the waste stream into its component material types;
- assignment of each material type to a processing route;
- processing each material type to generate secondary wastes; and
- disposal of secondary wastes and any unprocessed primary wastes.

266. The volumetric changes to raw waste due to processing, diversion and treatment are calculated by means of the application of a number of multiplicative factors and factors are also applied to take account of the packing fractions of wastes in HHISOs and HHISOs in vaults. These various factors have been revised to reflect experience thus far in the application of waste diversion options and are listed in Table 1 of the report.

8.2.4 Alternative Scenarios Considered

267. Four high level inventory cases were considered in the ESC in order to give an insight into the uncertainties over the level of future waste arisings. These are Cases A – D.

268. Case A is based on:

- inclusion of all materials in the UKRWI unless it can be confidently assumed that they will be routed elsewhere;
- exclusion of all waste streams comprising of VLLW and very low active LLW on the assumption that these can more appropriately be managed by disposal to a facility other than LLWR.
- inclusion of all waste streams in the UKRWI arising from the management of contaminated land (with the exception of waste from Dounreay and a small amount from Sellafield which is assumed to be disposed of locally);
- inclusion of LLW identified as being routed to the Geological Disposal Facility;

- inclusion of “orphan” wastes (i.e. with no routing information); and
- exclusion of new-build wastes.

269. Case A is treated as the Reference Case, intended to represent a reasonable case for wastes in the UKRWI. The other cases considered are:

- Case B, which considers the effects of a new nuclear reactor building programme on the inventory of LLWR (assuming 8 new reactors);
- Case C, which addresses the effects of uncertainties in the disposed volume to illustrate the effects of VLLW diversion (assuming a 25% reduction in physical volume but not in radioactivity);
- Case D, which considers the effects of alternative routing for some waste streams associated with the management of contaminated land.

270. The updated (2015) assessment presents results only for Cases B and C. Given the increased certainty that there will be a new reactor construction programme LLW Repository Ltd have concluded that the use of Case B as the Reference Case is a reasonable approach. Case C has also been adjusted to include for the fleet of new reactors.

8.2.5 Findings and Conclusions

271. The updated assessment (Table 3 in Appendix 4) suggests that the planned Vaults 10, 11 and 12 will all need to be constructed before 2050 although it is possible that some segregation of VLLW out of the LLW streams will be achieved. Such segregation may not be to the extent assumed for Case C and may, in any event, be offset by increased segregation of LLW out of Intermediate Level Waste (ILW) streams.

272. The report sets a number of factors which could affect these predictions including the effect of higher stacking in Vault 8; the effects of changes in waste segregation efficiency; the effects of changes in container packing efficiency; the effects of no waste being diverted for incineration or metal treatment; and the effect of complete segregation of organic and metal wastes. The factors affecting the prospects for each of these situations arising are discussed in the report and the implication of each scenario on fill rates is assessed. Other factors that could affect the volumes of LLW that require to be disposed of at LLWR are also set out in the report.

273. Based on the results of the revised PIER model calculations the report concludes that there is a high probability that, in the period to 2050, there will be a need to construct at least two further vaults (Vaults 10 and 11) assuming that Vault 9A is also constructed and filled. In a number of the cases assessed construction of the proposed Vault 12 would also be required by 2050.

274. The report notes that there currently being less waste than reported in the UKRWI, together with further improvements in LLW management over the levels assumed in the PIER model, might reduce the volume of LLW requiring disposal over the next few decades. However, other uncertainties in the volumes and timescales of likely arisings are such that much larger volumes of disposal capacity might be required than could be provided by the construction of Vaults 10 and 11 alone. Much of the disposal capacity provided by Vaults 10 and 11 would be required for wastes arising from the decommissioning of the high hazard facilities at Sellafield.

275. Even if the UK government was to decide to pursue the procurement of an alternative facility for the disposal of LLW, there is every likelihood that Vault 11 would be needed to ensure continuing safe disposal capacity over the 15 year timescale which such procurement would be expected to take.

8.3 Coastal Erosion and Sea Level Change

276. Core Strategy Policy CS12 requires that the promoter of any proposals for very long-term storage or disposal of LLW at the facility should "demonstrate that they are feasible in relation to the long term integrity of the site with regard to sea level rise and coastal erosion".

277. As noted in Section 6 of this Statement the Core Strategy does not provide any definition of the term "feasible" for the purposes of the policy and the word should therefore be interpreted in accordance with its common dictionary definition of "possible, practicable or achievable".

278. LLW Repository Ltd consider that use of the site for the permanent disposal of LLW in the existing and proposed engineered vaults has already been demonstrated to be feasible through the ESC, and acceptance of the ESC by the Environment Agency as the relevant regulator; i.e. the disposal of waste is achievable without any unacceptable risk to public health or safety. In accordance with the NPPF advice that, when considering issues of climate change and coastal erosion, Local Planning Authorities should focus on the development as an acceptable use of the land and should assume that environmental controls imposed by other regimes will operate effectively. Given the Environment Agency's conclusions, the WPA is able to conclude that the use of the site for permanent disposal of LLW is feasible and that this key test within Policy CS12 is satisfied.

279. Whilst this remains LLW Repository Ltd's view, the WPA and its advisers have taken CS12 to require consideration of the potential long term impacts of the use on the amenity of the beach at Drigg in the event that the site is affected by sea-level rise and coastal erosion. LLW Repository Ltd has therefore produced a further report on coastal erosion that has been submitted in support of the planning application. The key points arising from this report can be summarised as follows.

8.3.1 Background

280. The report sets out the current state of knowledge and levels of uncertainty with regard to projections of global climate change. It notes that such predictions are influenced by unquantified modelling uncertainties and that pattern of future sea-level changes will also be affected by international policy decisions and actions. Hence, it is not appropriate to assign probabilities to individual cases of climate and sea-level change; rather, ranges are quoted which are indicative of a range of conditions. Also, the coast is a dynamic environment and climate change may not alter the mechanics of coastal erosion and the environment may continue to evolve as it has done.

281. Against this background a structured programme was undertaken, as part of the preparation of the ESC, involving leading experts in the field, surveys and numerical predictive models to improve the level of understanding of coastal erosion. Notwithstanding this structured approach the outcomes of the projections still need to be treated with caution.

8.3.2 ESC Position on Coastal Erosion

282. Historical evidence shows that the coast in the vicinity of the LLWR has receded and, as it is anticipated that sea levels will rise, there is an expectation that, at some point in the future, the site will be disrupted through coastal erosion. As a result of the detailed studies that have been undertaken, and allowing for the uncertainties that need to be taken into account, it has been concluded that the disposal vaults will begin to be eroded on a timescale of a few hundred to a few thousand years. However, it is not possible to identify clearly a “best estimate” value within this range for future site disruption.

283. Potential implications of climate change for the evolution of inland features include for the LLWR final cap (which could be subject to erosion). Changes to surface landscape components including vegetation, crops and surface water bodies have also been assessed but the evidence indicates that erosion and other processes will not be of sufficient impact to disrupt or significantly change the LLWR system prior to site disruption as a result of coastal development.

8.3.3 Radiological Impacts

284. The radiological impacts for the LLWR are fully assessed in the ESC and have been accepted by the Environment Agency as consistent with their (stringent) guidance for the identified additional disposal capacity (which for the purposes of the ESC comprises Vaults 9a- 14 and Vaults 15 -20).

285. One of the key regulatory requirements is that people in the future are afforded the same level of protection as would be applied today. The 2011 ESC demonstrates that all the assessed impacts from the LLWR, including those arising from coastal evolution, are consistent with the regulatory risk guidance levels.

286. It is important to note that the ESC assessments are based on passive safety arguments and do not rely on future human action at any stage beyond site closure. However, the design of the Repository does not foreclose future options and would not prevent the construction of coastal defences should people in the future wish to do this.

8.3.4 Coastal Defences

287. The characteristics of waste disposed at the Repository are such that after the first 300 years the decline in radiation levels will slow. Interventions to delay disruption by coastal erosion on a timescale of decades will not therefore have a significant effect on the radiological impact. In any event, radiological effects have been assessed in the ESC (and found to be within safe limits) on the assumption that coastal defences are not constructed.

288. Defences would need to be continuously maintained to ensure effectiveness; an approach which conflicts with the regulatory principle of avoiding unreasonable reliance on human interventions to protect the public and the environment.

289. Whilst not warranted from a regulatory or safety perspective, the ability to implement defences in the future exists and there are a number of potential techniques that could be used (either individually or in combination), although given the uncertainties around the timescales and nature of erosion in the future, there is no guarantee that such approaches would be effective.

8.3.5 Beach Amenity

290. The precise nature of the impact on the Repository is dependent on a number of factors, including the magnitude and timing of the sea-level rise and the distance from the current coastline and elevation of the Repository. Determining the type of disruption is therefore inherently uncertain but notwithstanding this the ESC has concluded that it will probably be as a result of cliff recession with the vaults being undercut.

291. This is expected to result in the distribution of engineered materials and waste onto the beach. The process of erosion and deposition of materials is expected to result in an increase in man-made materials appearing on the beach.

292. Any consideration of the impact on the amenity on the beach will necessitate consideration against the baseline that will differ in the future due to the presence of other structure and built development along the coast also being eroded and contributing to an increase in debris present. The type of material disposed at the Repository is also not as visually intrusive as other man-made objects that may appear on the beach, such as plastic bags and bottles. The impact is therefore unlikely to have a significant effect, with coastal defences considered to have a greater visual impact.

293. An assessment of the effect of coastal erosion on landscape character and amenity is included in the Landscape and Visual Amenity assessment forming Appendix G to the ES.

8.3.6 Conclusion on Coastal Erosion

294. The ESC, which assesses the future safety performance of the facility and the site, concludes that the site will erode at some point in the future. There is no radiological impact that will result from this that would require use of the beach to be restricted in the future. There will be some change in the visual quality of the coastline but this must be viewed in the context of erosion along an entire length of coast, not just that adjacent to the Repository, and the change in the character and appearance as a consequence.

295. There is no significant impact on the amenity of the beach, and the process described above will take place regardless of the proposed development taking place.

296. The ESC demonstrates that the proposed development is feasible in relation to coastal erosion and therefore complies with CS policy CS12. Whilst it is not considered that this policy necessitates consideration of the amenity of the coast, the assessments carried out as part of the ESC and the changing context of the coastline in the future as assessed in the LVIA included in the ES ensures that the development will not have an adverse effect in terms of amenity.

8.4 Waste Miles

297. The supporting text for Core Strategy Policy 12 makes reference to the issue of waste miles and makes an assertion that acceptance of all type of LLW from around the UK is not sustainable. It goes on to correctly recognise that this practice does not take place, as '*the NDA strategy for the optimal use of the Repository, in accordance with*

Government policy, is that it will only be used for those wastes with a higher intrinsic hazard that really have to be managed in this type of engineered facility'.

298. It goes on to accept a continued national role for the Repository as an essential component of the UK waste management capability.

299. There is clearly, therefore, an acceptance that waste will continue to be transported to the Repository from around the UK where it is necessary to do so. In such circumstances the continued operation of the Repository as a national facility remains acceptable and fully in accordance with national and local planning policy (indeed the policy text recognises as much stating that the Repository's continued operation is consistent with national policy and local aims that West Cumbria is a centre of excellence for radioactive waste management).

9 Environmental Impacts

9.1 Environmental Statement

300. The application is accompanied by an Environmental Statement that provides a comprehensive assessment of all the technical, environmental and sustainability issues raised by the proposed site works. The scope of the assessment has been agreed with the WPA and covers:

- Radiological and non-radiological effects;
- Transport and access effects;
- Noise effects;
- Landscape and visual effects;
- Ecology and nature conservation;
- Effects on air quality;
- Effects on geology, soils and hydrogeology;
- Aquatic impacts;
- Economic and social impact; and
- Sustainability assessment.

301. It is not necessary to repeat the conclusions of the Environmental Statement (which are also summarised in the Non-Technical Summary) within this planning statement, but an overview of the key planning considerations and particularly the ecological effects, landscape and visual impacts and the effects of construction work on residential amenity are important issues in the determination of the application and are discussed below

9.2 Ecology and Nature Conservation

302. An extensive assessment of the potential impacts of the proposed development on the various habitats and species that can be found within the site and adjacent areas, including the adjacent Drigg Coast SAC/SSSI and Cumbria Coast Marine Coastal Zone (MCZ), has been undertaken. An extensive suite of updated habitat and protected species surveys have been carried out to supplement 15 years of survey information previously obtained in respect of the site, and to establish a comprehensive baseline position against which an ecological impact assessment has been carried out.

303. The impact assessment has identified that the proposed development will result in losses of habitats at various intervals as the phases progress, resulting in direct impacts on breeding birds, common lizard, adder and slow worm, although the impacts have been assessed to be significant at the local level only. The impacts on these

species will be phased throughout the proposed development as the trench cap grassland is progressively removed (and then re-instated) and stockpile areas created.

304. The impact assessment concluded that the proposed development would not result in any significant effects on the Drigg Coast SAC/SSSI or Cumbria Coast MCZ, or on any of the nearby locally designated County Wildlife Sites. Direct and/ or indirect impacts on other protected species or species that do not appear on the protected species register that are present within the proposed development boundary were assessed as not significant. These include great crested newt, other amphibian species, natterjack toad, barn owl, foraging bats, otter, aquatic invertebrates, terrestrial invertebrates and roe deer.

305. Suitable mitigation measures have been specified and will be implemented to ensure that the proposed development will not result in any significant negative residual effects on the species affected by the proposed development, including embedded mitigation. As great crested newt is a European Protected Species, an appropriate licence will be obtained from Natural England where necessary prior to the commencement of works to ensure compliance with the Habitats Regulations and to maintain the favourable conservation status of the population.

306. In addition to mitigation for impacts on protected species and species that do not appear on the protected species register, a detailed package of habitat enhancement on the wider LLWR site has been developed during consultation with the WPA, and will be delivered to increase biodiversity value in accordance with national planning policy.

307. In the long-term, the habitat available on the LLWR for amphibians, reptiles and breeding birds will be substantially increased upon completion of the proposed development. The phased nature of the proposed development will enable grassland to progressively develop, and re-colonisation by amphibians, reptiles and ground nesting birds is anticipated to occur within 4 -5 years, based on recorded colonisation of previously disturbed areas of the LLWR site by these species. Re-planted woodland areas will also become sufficiently mature within the lifespan of the proposed development to provide nesting habitat for breeding birds.

308. The proposed development is therefore consistent with Policy 4 of the Mineral and Waste Core Strategy and Policy 10 of the Generic Development Control Policies DPD. It also fully complies with paragraphs 109 and 118 of the Framework.

9.3 Landscape Character

309. The significance of the proposed cap installation on the landscape character of the surrounding area has been assessed by measuring the existing landscape sensitivity and the magnitude of change.

310. In respect of the loss of the existing perimeter tree cover to be removed in advance of the capping works, the assessment concludes that this woodland is a relatively recent addition to the landscape and exists as a result of the LLWR, rather than being a pre-existing landscape feature that was incorporated into the site. It is therefore capable of being successfully replaced.

311. Overall, the proposed capping development would have a slight effect on the baseline landscape character of the surrounding area and no effect post-operation.

312. The proposed development will be acceptable in terms of its impact on landscape character. On this basis it is considered to comply with Policy DC12 of the Generic Development Control Policies DPD and paragraph 114 of the Framework.

9.4 Visual Impact

313. A series of 15 no. receptor viewpoints were identified and agreed with the WPA from which to assess the visual impact of the capping works. A zone of theoretical maximum visibility has also been modelled and plotted, providing a guide to the location, extent and magnitude of expected visual impact.

314. A number of potential minor and temporary impacts were identified through the assessment, with changes to the nature and increased visibility of previously screened areas within the LLWR site resulting from the removal of the perimeter tree cover and from the temporary use of cranes, lighting and machinery etc. There will also be some visual impact arising from the scale and form of the single-dome landform cap.

315. In terms of mitigation, the scheme has been designed and is intended to be implemented, such that its phasing will ensure that the earliest works provide the greatest extent of screening and mitigation for the latter integrated disposal and capping phases and the permanent end-state appearance of the closed site. Early establishment of these mitigation measures is a key benefit of the proposed scheme design and its construction sequencing. In addition, due to the length of time between phases, extensive growth of the perimeter planting on the pre-formed capping 'shoulders' will take place, enhancing its benefit and effect.

316. Whilst some material impacts are therefore identified, these will take place over a relatively short period of five years for receptors closest to the site boundary; primarily from a public right of way on the northern boundary and the properties at Summer View. Visual impact of moderate significance would occur temporarily at Stubble Green and from the vicinity of Sandy Acre on Shore Road.

317. The visual impacts from the remaining view-points would be of negligible significance as in most cases the LLWR site is not prominent in landscape views and installation of the capping works would be a minor and indistinct element of the view and/or would be fully screened by the mitigation planting.

318. In the absence of an unacceptable visual impact, the proposed development is considered to fully comply with Policy DC12 of the Generic Development Control Policies DPD and paragraph 114 of the Framework.

9.5 Residential Amenity

319. It is recognised that the proposed development is a major long-term construction project and, as with any project of this nature, has the potential to impact the amenity of the occupiers of adjacent properties during the construction stages.

320. The potential impacts are concentrated during Phase 1 when the majority of activities will occur at the part of the application site closest to residential properties. The potential for disturbance arises from:

- visual amenity;

- noise and vibration;
- air quality;
- lighting; and
- traffic.

321. These are considered below, together with the proposed measures to minimise and mitigate any impacts through the implementation of a construction Environmental Management Plan for the site.

9.6 Visual Amenity

322. The proposed development will result in an initial reduction in the amount of boundary planting present along the northern, eastern and western boundaries of the LLWR site. Whilst this will allow views of the application site and of the formation of the first phase of the landscape cap (which includes the formation of the cap shoulder), once it is formed, this part of the cap and the screening belt proposed around its edges will provide screening thereafter. Higher stacking of LLW will not take place until this phase of the cap is formed and will therefore be screened from residential views as a result. There is also potential to form a temporary grassed bund on top of the cap shoulder to provide further visual screening for those properties further from the site, should this be necessary.

323. This phasing of work ensures that the visual impact of the development, in terms of the outlook from the residential properties close to the site, is acceptable.

9.7 Noise and Vibration

324. Construction noise will be generated by activities associated with the movement and operation of mobile plant and rail and road movements.

325. A full assessment of the potential construction and vehicle noise impact has been undertaken as part of the Environment Impact Assessment. The assessment is based on a robust worst-case scenario which assumes all plant being used for 100% of the proposed construction hours. The use of mitigation such as acoustic fencing will ensure that noise levels at the nearest residential properties associated with all construction activities, with the exception of the vegetation stripping is within acceptable limits. Adherence to the mitigation procedures given in BS5228 and, where necessary, the employment of local noise barriers to specific items of plant / construction activities, should ensure that the significance of construction noise is negligible at all receptors.

326. In addition, a comprehensive range of best practice measures will be employed as part of an Environmental Management Plan (the implementation of which can be secured by condition) to further reduce the impact during the construction periods. These include the use of plant equipment that complies with EU noise emission limits, its shutdown when not in use and siting to minimise potential disturbance.

327. The noise associated with the additional road and rail traffic movements has also been assessed as being negligible and no further mitigation is required. Similarly, noise from operational activities will not exceed the current levels, which have been assessed as generating very little off-site noise, and no mitigation is required.

328. The assessment also considers the issue of vibration, but recognises that vibration impacts are not usually associated with mobile plant, fixed plant or haul routes. In this case there will also be a relatively large distance between the plant and nearest residential properties. Vibration will not impact on these properties and assessment has not, therefore, been deemed necessary.

9.8 Air Quality

329. The proposed development will result in emissions generated by plant and equipment and traffic movements during the construction and operational phases.

330. It identifies a number of potential types of emissions including dust, and emissions from plant, road traffic and rail traffic. It identifies a number of forms of mitigation to reduce emissions as good practice, with the impact from vehicle emissions mitigated by means of the use of catalytic converters and the regular maintenance of vehicle engines. Dust will be controlled using dust suppression measures, use of wheel washes, restricting vehicle speeds within the site and not undertaking soil stripping above certain wind speeds.

331. Overall it concludes that:

- no properties are predicted to be affected by slight, moderate or major air quality impacts;
- no new exposure is being introduced with the proposed development;
- no exceedances of an air quality objective or limit value are predicted;
- uncertainty in the predictions undertaken has been minimised through the application of worst case assumptions; and
- cumulative impacts have also been considered and no slight, moderate or major air quality impacts have been identified.

332. The significance on air quality is therefore assessed to be negligible.

9.9 Lighting

333. Temporary lighting will only be used during the winter months to enable work to take place within the proposed hours of working. Lighting is not proposed on the cap or in areas close to residential properties, thereby ensuring that no adverse impacts will result in terms of light intrusion or spillage.

9.10 Traffic

334. Maximum use will be made of the rail network in the delivery of construction and profiling material and the continued delivery of LLW to the site by rail.

335. The only construction materials to be delivered by road are bentonite and cement powders and HGV deliveries will be restricted to 0900 to 1530 hours to avoid peak traffic, school trips and farm vehicle / animal movements. Advance written notice of deliveries outside these hours will be given to the Parish Council and HGV routing will further lessen any conflict if required.

336. The assessment models a maximum of 60 construction workers accessing the site each day during each phase of development, generating a maximum of 120 two-way car trips from 0800 (arrival) to 1800 hours (departure). In reality this number is likely to be much lower as a construction worker shuttle bus will be provided to and from the site. In addition, LLW Repository Ltd is committed to the use of local labour and sub-contractors as far as is possible. This approach will substantially reduce journey distances to work and the impact of travel on the county road network.

337. The analysis of the worst case construction traffic impacts on the local highway network shows that construction traffic is minimal on the A595 but appears high on the B5344 due to the relatively low base flows on this road. The junctions within the vicinity of the site have been modelled to take account of maximum traffic movements and all have been found to operate with substantial capacity during the AM and PM peak periods for each phase.

338. There will therefore be no adverse impact on the operation of the highway network as a result of the development during its construction and operation.

339. An assessment of the capacity of the rail network to accommodate the rail movements associated with the import of construction material has been undertaken, including consideration of the impact of the Moorside new nuclear power station, National Grid's proposed North West Coast Connections project (comprising the installation of new power lines to transmit the energy generated by the new power station and other energy projects) and West Cumbria Mining's proposed off-shore coking coal mine. The assessment demonstrates the likelihood that adequate capacity to accommodate additional rail movements without restriction will exist. This will enable a significant amount of material to be brought to the site by rail and minimise the use of HGVs on the road network.

9.11 Environmental Management Plan

340. An Environmental Management Plan (EMP) will be implemented during the construction and operation of the development to further improve the limited impacts identified above. This will nominate the member of staff with overall environmental responsibility, the EMP supervisor, and will detail of their responsibilities. Contractors will also be required to appoint an appropriate person responsible for overseeing the implementation of the EMP.

341. The EMP will include targets against which performance will be measured and action taken to improve performance where necessary, ensuring that continuous improvements are made, with lessons learnt from each phase being put into practice in later phases.

342. The EMP will also set out the restrictions on working hours (restricted to 0730 - 1800 from Monday - Friday) with weekend working limited to 0800 -1300 and specify the mitigation measures to be implemented in relation to any impacts identified above, to ensure that no unacceptable impacts arise.

9.12 Conclusion on Residential Amenity

343. The proposed development will not result in any unacceptable impacts in terms of residential amenity. It will therefore fully comply with Policies DC1 DC2 of the Generic Development Control Policies DPD and paragraphs 110, 120, 121 and 123 of the Framework.

344. The development also complies with Policy DM22 of the Copeland Local Plan.

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10 Other Material Considerations

10.1 National Planning Policy Framework

345. The overriding principle of the Framework is to achieve sustainable development. It sets out a clear presumption in favour of sustainable development and directs local planning authorities to approve development proposals that accord with the development plan without delay.

346. It has been demonstrated above that the proposed development will comply with the development plan and that the presumption in favour of sustainable development is engaged.

347. Further support for the development can be demonstrated through the extent to which the development is aligned with the Framework's core planning principles, notably in delivering the infrastructure required by the country and to meet the development needs of an area. National LLW policy and local planning policy recognise the important role of the Repository and make clear that it is an essential facility which fulfils a national role, whilst also meeting locally arising needs. In the absence of an alternative, its importance is underlined.

348. The development will not result in any unacceptable social, economic or environmental impacts. The Environmental Statement and Environmental Safety Case demonstrate that there are no unacceptable environmental impacts, and some beneficial impacts from the construction or operation of the facility.

349. The development will make an economic contribution to the area through the creation of construction jobs, supporting operational jobs and the flow of money through the supply chain. This is considered further below.

350. The development will contribute towards the social dimension of sustainable development through the provision of a facility which is needed for the UK and Cumbria as part of its LLW waste management infrastructure thereby enabling the area to take social responsibility for its needs.

351. Accordingly, the development is considered to represent sustainable development in terms of the three dimensions within the Framework. This represents a material consideration to which significant weight should be afforded.

10.2 Economic Benefits

352. The proposed development will deliver a range of important direct and indirect socio-economic benefits and result in moderate to major positive impacts, as summarised in the socio-economic chapter of the ES. These are predominantly in the protection of existing jobs and the creation of new ones during both the construction and operational phases of development and the continued well-being of the local community through LLW Repository Ltd and NDA support.

353. In addition, the development will also contribute to the benefit and support of the wider nuclear sector in West Cumbria and will support the local economy through continued

purchasing, supply chain deployment and the use of local services and the hospitality industry. There are no significant negative social or economic impacts identified.

354. Overall, by extending the lifetime of the facility, operations at the LLWR will make a positive on-going contribution to the long-term sustainability of the local economy and community in Drigg, Copeland and the wider Cumbria area.

11 Summary and Conclusion

355. This Planning Statement accompanies a detailed planning application submitted by LLW Repository Ltd, for a package of works in connection with the delivery of additional LLW disposal capacity at the Low Level Waste Repository (LLWR) near Drigg, West Cumbria.

356. The proposals comprise a series of individual works which collectively provide for the long-term extension of the available and planned remaining LLW disposal capacity at the LLWR to extend its lifespan, and for the final capping of the site and its future closure.

357. The national policy framework for the long term management of solid low level radioactive waste establishes the need for continued LLW disposal capacity and the LLWR and the need to extend its lifetime. The application is wholly consistent with this policy objective as well as the adopted development plan, and meets an important national need.

358. The long term safety of the proposed extended lifetime, engineered closure and final end-state of the LLWR has also been thoroughly assessed and tested and the submitted 2011 Environmental Safety Case, which is now approved.

359. All other material planning considerations have also been assessed including the effect of the development on ecology, the landscape, the effect on residential amenity, the effect on highway and transport movements and a wide range of issues have been considered under the scope of the Environmental Impact Assessment undertaken in support of the application. No significant environmental impacts have been identified, subject to appropriate mitigation, and there are no technical constraints that would prevent development. be adequately mitigated.

360. The proposals have also been subject to discussions with key stakeholders, which have confirmed the acceptability of the development in principle and the absence of technical constraints. Initial consultation with local residents in Drigg and the surrounding area has also demonstrated general support for the scheme.

361. Having considered the above, it is clear that planning permission should be granted for this important scheme that will ensure delivery of the UK LLW Strategy and provide essential continued LLW disposal facilities for the UK in the long term.

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Appendix 1: Schedule of Application Drawings

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Drawing Submitted for Approval

- Schematic Design Drawings (in Volume III of the ES)

  - E-01 Plan and typical cross-sections (revised)

  - E-02 Long sections (revised)

  - E- 03 Plan showing Half Height ISO containers (revised)

  - D- 03 Cap- typical details

  - D- 04 Vault and edge details

  - D- 05 Cap – vent details

  - D- 06 Typical Sections

  - D- 07 Trench Cap edge details

- Construction Sequence Drawings (in Volume III of the ES)

  - C- 01 Phase 1 (schematic)

  - C- 02 Phase 2 (schematic)

  - C- 03 Phase 3 (schematic)

  - C- 04 Phase 4 (schematic)

  - C- 05 Phase 5 (schematic)

Drawings Submitted for Information Only

- 47070159/RES/01 End of Phase 1

- 47070159/RES/02 End of Phase 2

- 47070159/RES/03 Interim Phase 3a

- 47070159/RES/04 End of Phase 3

- 47070159/RES/05 End of Phase 4

- 47070159/RES/06 End of Phase 5

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Appendix 2: Pre-Application Advice Letter from CCC

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Cumbria County Council

Environment and Community Services • County Offices• Kendal • LA9 4RQ
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30 January 2015

Mr P Singleton
Director
Head of CPO, Land Assembly and Expert Witness
Turley
1 New York Street
Manchester
M1 4HD

Dear Mr Singleton

Low Level Waste Repository – Request for Pre-Application Advice

I write with reference to our recent discussions and your formal request for pre-application advice received on 9th January 2015.

This letter and accompanying "Site Assessment" proforma constitutes Cumbria County Council's formal pre-application advice on the proposed development by LLWR Ltd. In addition to the documentation submitted in support of your pre-application request, the response also recognises and reflects the constructive pre-application discussions that we have had with LLWR Ltd over recent months.

I would also like to take this opportunity to clarify what I understand are agreed key issues associated with the application. Firstly, we understand that in relation to the proposed new disposal capacity, it is LLWR Ltd's intention to apply for a reduced scheme when compared to the current live application (ref: 4/11/9007). The revised proposal would allow for new disposal capacity within existing Vaults 8 and 9, and within Vaults 9a, 10 and 11 which require construction. For clarity, we would therefore recommend that the proposal should be identified as follows (suggested amendments underlined):

Phased construction of Vaults 9a, 10 and 11 and for the disposal of low level radioactive wastes within these new Vaults and within the existing Vault 9 with higher stacking, for the retention of temporarily higher stacked containers within Vault 8 with additional higher stacking. Phased construction of a permanent engineered capping layer over Trenches 1 to 7 and Vaults 8 to 11, with other ancillary works.

From your email correspondence dated 28th January 2015 (Paul Singleton to Kathryn Donnelly) we understand that this revised description would be acceptable to you, and reflects the position that any new application would only include for an engineered capping layer over the Trenches 1 to 7 and Vaults 8 to 11, rather than extending to any future Vault 14. It is understood however that the applicant may design the cap so as not to preclude future development beyond Vault 11, although any such future development would of course be subject to planning consent.

In this regard we would expect the red line boundary of the planning application to allow for the capping of Vault 11, but not extending to the capping of any potential vaults proposed in the future. We recognise however that the planning application boundary will also need to allow for drainage and operational areas and trust this will be addressed accordingly in any future planning application.

I also wish to clarify our correct understanding of the volumes of Low Level Waste disposal that would form part of the planning application, specifically the volumes for Vault 9a (23,000m3), Vault 10 (120,000m3) and Vault 11 (120,000m3). This is set out in the report “Need for Disposal Capacity at the LLWR – Version 2” (Table 10, pg 20, January 2015).

The attached Site Assessment proforma provides further detailed comments relating to the general planning principles and environmental issues, and provides the Authority’s view of the broad extent of the supporting information required. Much of the commentary arises from our detailed understanding of the LLWR site gained from our assessment of the current live planning application (4/11/9007), and subsequent discussions as to how the proposal might best be adapted. Any future planning application will of course be determined on its own merits, and subject to the usual consultation procedures.

We would also welcome the opportunity to continue to work closely with you in the pre-application stage, particularly in the provision of a detailed Scoping Opinion, which we understand you will be requesting in the near future. I understand that LLWR Ltd is also engaging with Natural England with regards to their pre application service and I would commend this action.

I trust that the above and attached will provide sufficient reassurance for LLWR Ltd to withdraw planning application 4/11/9007 by Monday 2 February 2015, and to proceed with a new application on the basis of a smaller revised scheme based on the key principles set out in this advice.

Should you wish to discuss any of the above, please do not hesitate to contact me.

Yours sincerely

Iain Fairlamb
Planning Services Manager

Encs. Site Assessment proforma

Environment & Regulatory Services
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Cumbria County Council

Site Assessment

Proposal / Location	**Ref No. Pre-App_41501**
Proposal Phased Construction Of Additional Vaults (9a-11), Disposal Of Low Level Radioactive Wastes In The New Vaults and Within Vault 9 With Higher Stacking, Retention Of Temporarily Higher Stacked Containers Within Vault 8. Phased Construction Of A Permanent Capping Layer Over Trenches 1-7 and Vaults 8-14, With Other Ancillary Works.	
District **Copeland**	Location Low Level Waste Repository Near Drigg Seascale CA19 1XH
OS Grid Reference	499252 305419 **Area of Site** 50.03ha
Lake District National Park **Yorkshire Dales National Park** **AONB**	Not applicable

Description of Proposed Development:
The proposal would seek planning permission for the following:

Description agreed by correspondence–

- The phased construction of 3 new Vaults for the disposal of LLW – Vault 9a, 10 and 11;
- To permanently retain, and increase the height and extent of, the current temporary higher stacking of LLW above Vault 8;
- To use the existing Vault 9 for the disposal of LLW rather than for storage as currently permitted and to stack LLW higher within this vault;
- The phased construction of an engineered and landscaped capping layer above Trenches 1 to 7, existing Vaults 8 and 9 and proposed new Vaults 9a, 10 and 11;
- The installation of vertical cut-off walls around the proposed waste disposal area and the extension of the pile wall adjacent to the trenches and new Vaults;
- Other ancillary works and temporary construction facilities, including the diversion of Drigg Stream; landscaping and tree planting works; the formation of material stockpiles; the formation of a contractors' compound prior to each phase of construction and associated access roads, hardstandings and construction mitigation works.

Planning

Need

The disposal of waste falls at the bottom of the waste hierarchy and is the least desirable solution. It should be used where none of the other options (recovery, recycling and so on) is appropriate. In

granting planning permissions for waste management facilities, national policy requires that planning authorities should be mindful not to undermine the objectives of the Local Plan through prejudicing movement up the waste hierarchy.

The LLWR have discussed the justification for a disposal facility for LLW, and we have received a copy of the revised "Need for Disposal Capacity at the LLWR" version 2. The report contains assessment of the additional issues discussed in Workshop 4 prior to the Christmas break, and will be extremely helpful in assisting with the determination of a revised application for a smaller facility.

In respect of need, the Council considers the planning case is much stronger for providing a facility in accordance with that modelled in Table 10 of the report, than for the scheme as currently submitted. Subject to future consultation, based on the additional evidence now provided, we would anticipate that officers could make a positive recommendation to the Committee in respect of the need for disposal capacity within a revised scheme which includes Vaults 8 -11, with the capacity of vault 10 reduced slightly to 120,000m^3.

Coastal Erosion

CMWDF Core Strategy Policy 12 (Low Level Radioactive Waste) requires that proposals for very long term storage or disposal of waste at the Low Level Repository should demonstrate that they are feasible in relation to the long term integrity of the site with regard to sea level rise and coastal erosion. As evidenced by the current planning application, LLWR Ltd accept that the site is likely to be eroded by the sea within an estimated timescale of the erosion beginning within 300-1000 years. This issue has been discussed at some length during our workshops.

The impacts of future erosion of the facility (including impacts in respect of landscape and amenity) need to be assessed through the EIA and planning process in more detail than in the current application. Cumbria County Council have set out in a note provided to LLWR the additional information that needs to be included in the assessment, in order to determine whether the proposal accords with policy 12.

A paper "Coastal Erosion Summary" (RP/340737/PROJ/00032 Version 2) has now been submitted, which provides additional context in respect of the potential impacts from coastal erosion in terms of landscape, visual impact and amenity. Further assessment is required through the EIA process, in order to determine the type and extent of visual, landscape character and amenity impacts that would result from the erosion process and appropriate mitigation measures.

In respect of the information so far submitted, coastal erosion is better addressed than in the previous application and the Authority is pleased to note that further detailed assessment work is planned whilst undertaking the landscape aspects of the EIA. This should include an assessment that it accords with policy 12 in respect of being feasible in relation to the long term integrity of the site which will relate to wider issues, including the ESC.

Radiological capacity

On the basis of the Environment Agency's comments and their assessment of the Environmental Safety Case, it is considered that the current live application is acceptable in terms of the radiological issues, and that ongoing regulation under the Environmental Permit will ensure this continues to remain the case over the lifetime of the development. Further advice will be sought from the Environment Agency through the consultation process on this application.

Transport/waste road miles

CMWDF Core Strategy Policy 1 (Sustainable Location and Design) states that proposals for waste management developments should demonstrate that their location will minimise, as far as practicable the 'waste road miles' involved in managing the waste unless other environmental/sustainability considerations override this aim. This general approach is reiterated in the NPPF (March 2012) which states that developments generating significant movements should

preferably be located where the need to travel will be minimised and the use of sustainable transport modes can be maximised (Paragraph 34). National Planning Policy for Waste also states that providing a framework in which communities and businesses are engaged with and take more responsibility for their own waste in line with the proximity principle has a pivotal role in delivering this country's waste ambitions.

The Authority is pleased to note that a further report addressing the main sources of LLW planned to be managed within this facility in the period up to 2050, and how these wastes will be transported to the site, is being prepared. This will considerably assist the Authority in determining whether the proposal accords with Core Strategy Policy 1. It will be important that the environmental impact of transporting material for disposal is assessed through the EIA process. In view of the amendments to the scheme in respect of the proposed landform, account should also be taken of transportation of the materials necessary to complete the cap profile adjacent to vault 11. The Authority would welcome maintaining the current constructive ongoing dialogue in respect of the level of detail and extent of information supplied. The Authority would also anticipate the continued transport of waste to and from the site to be provided by the existing rail network and on site sidings.

Features to be retained / Services

Rights of Way

Bridleway No. 405012 runs adjacent to the north western boundary of the site and must not be altered or obstructed by the proposed development. The land adjacent to the site is open access land.

Conservation Area / Listed Buildings

No known listed buildings or conservation areas would be affected by the proposed development.

Tree Preservation Orders

No known Tree Preservation Orders would be affected by the proposed development.

ENVIRONMENTAL & DESIGN CONSIDERATIONS

Highways

DC Highways Local Network Issues:

A Transport Assessment will need to be submitted in support of a revised planning application and to inform the Environmental Statement. The scope of the Transport Assessment should be agreed with the Local Highway Authority and it is therefore considered that a scoping report should be submitted to the local Highway Authority for comment and agreement prior to commencing the assessment.

It should be noted that the Transport Assessment submitted in support of the current live application requires updating to include:

- The traffic flow data used was based on counts undertaken in 2004. Recent link and junction counts should be used in order for the assessment to be adequately able to reflect current traffic flows.
- The Transport Assessment contained no consideration of local highway safety issues. An analysis of the personal-injury accident record within the study area for the most recent 5-year period should have been included.

The TA should also adequately consider the construction traffic associated with proposal. While it is intended that the construction of Vaults 9A to 11 will be phased, the impact of the construction related traffic for at least the initial phase should be fully assessed as part of the information submitted in support of any new application, and include details of how subsequent phases will be addressed, such as the provision of a Construction Traffic Management Plan (including an indication of its scope or contents) which would be produced, submitted and agreed prior to the commencement of each phase, and secured via a Section 106 Agreement.

While the intention of the current application to make the maximum use of rail and thereby reduce the impact on the highway network, is welcomed, it is recognised that the cumulative impact of this proposal and others, particularly National Infrastructure projects which are currently at pre-application stage, may have a significant implications with regards to available rail capacity. This issue should be considered in the assessment so that the feasibility and reasonableness of any assumptions made in this regard can be adequately demonstrated to the satisfaction of both the local Highway Authority and Planning Authority.

Highways Agency: Strategic Network Issues (*e.g. M6, A66, A595 etc…***)**
The proposed application site is 10km south of Highways Agency network. The Highways Agency raised no objections to the current live application 4/11/9007. They acknowledge that evidence shows that the existing rail and road network can accommodate the traffic likely to be generated by import of the bulk materials required for the development with little adverse effect on the operation of the network.

Flood Risk

A Flood Risk Assessment will need to be submitted in support of the proposed development and to inform the Environmental Statement.

It is noted that the current live application (4/11/9007) is supported by a FRA which considers that there would be a low risk of flooding associated with the proposed works. With the mitigation measures put forward it is considered that there would remain only a residual risk of flooding associated with failure of the surface water drainage system or exceedance of the system's design capacity. Regular maintenance and inspection of the drainage system would need to be undertaken to ensure that the system continues to perform as designed. In this regard the current live application (4/11/9007) is considered to be compliant with NPPG and CMWDF Development Control Policy DC13 (Flood Risk), subject to the implementation of suitable planning conditions.

Notwithstanding any relevant ecological issues, the diversion of Drigg Stream would be subject to detailed consent being agreed with the LLFA consenting team.

A Drainage Strategy should also be submitted in support of any planning application.

Nature Conservation

Designations (*e.g. SACs, SPAs, SSSIs, RAMSAR, County Wildlife Sites)***:**
Both the application site itself and the surrounding area are of significant ecological and biodiversity value. The proposed development lies immediately adjacent to a nationally and internationally designated site known as Drigg Coast Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC). Drigg Stream, which flows through the application site and is subject to diversion as part of the proposed development, discharges into the SSSI/SAC. A Cumbria Wildlife Trust site (CWT) lies to the immediate north of the application site. The primary reasons for the selection of the Drigg SAC are the habitats relating to the estuary and dunes. In addition there are further qualifying features present within the site including mudflats and sandflats, Atlantic salt meadows and dune slacks. The Drigg SSSI interest features include the SAC habitats.

The Cumbria Coast Marine Coastal Zone was designated in November 2013. It is an inshore site which stretches 27 km along the Cumbria coastline from St Bees to the Ravenglass Estuary, including the intertidal coastal area to the west of the LLWR site.

Protected Species / Habitats:

The Drigg SSSI interest features also include Natterjack Toad and Great Crested Newt (which are European protected species), invertebrates, amphibian populations, rare plant species and reptiles (adder, slow worm and common lizard).

From the current live application it is understood that within the LLWR site a diverse mosaic of habitats are supported and that its proximity to the dune heaths, grasslands, slacks and pools of the Drigg Coast SAC/SSSI has facilitated colonisation by a range of protected species including great crested newt, common lizard, adder, slow worm and natterjack toad. The applicant has also previously advised that habitats within the site support breeding birds, including ground nesting species, foraging bats and a main badger sett, and that Drigg Stream has provided suitable habitat for a resident and foraging population of otter.

Surveys:
Given the above ecological and biodiversity interests, any application and Environmental Statement must be supported by a wide range of survey information. There are a number of outstanding matters within application 4/11/9007 relating to ecological issues, which the County Council has been working hard with the applicant to resolve. The points at issue do not involve the overall principle of the acceptability of the scheme, but relate primarily to survey data and its adequacy or otherwise. Resolution of the issues in respect of surveys is required to inform the HRA, AA, the mitigation proposed as a result of the EIA, and drafting of planning conditions, all of which must be satisfactorily addressed before any planning permission could be granted.

We are very encouraged that as part of the current pre-application discussions, LLWR Ltd is now engaging directly with Natural England regarding ecology matters and hope this will lead to faster progress being made.

Habitats Regulation Assessment:
The Habitats Regulations require that the County Council, as competent authority, must complete a Habitats Regulation Assessment (HRA) on the effects of the interest features of the Drigg Coast SAC before considering granting planning permission. The HRA would cover the qualifying features of the SAC, which for Drigg Coast are restricted to coastal habitats, rather than species. Any HRA would therefore concentrate on whether or not development would adversely affect the integrity of the habitats present within the SAC, by impacting on the conservation objectives of the site and the conservation status of the habitats.

It should be noted that the County Council would seek to make maximum use of the HRA/AA prepared by the Environment Agency as part of the environmental permit variation process, although it is acknowledged there would be differences in some of the information required from the applicant, principally due to the County Council's requirement to consider construction impacts on the proposed periods of operation. The applicant has already been made aware that, should a HRA be undertaken on the current live application, further information would be required relating to:

- Impact during construction on the 'local' hydrology within the SAC and CWT sites, particularly during creation of the new Drigg Stream and the cut-off wall, alongside the SAC habitats
- Impact during construction on the 'local' hydrology within LLWR site in respect of natterjack toad and GCN breeding pools; potential for loss of ephemeral breeding pools within the existing upper Drigg Stream; lowering of local groundwater adjacent to the existing breeding pools as a result of insertion of cut-off wall, dewatering, construction of settlement pond, etc
- Impact of mobilisation of contaminated particles in the Drigg Stream on the SAC habitats downstream during works in the watercourse during stream diversion – it is understood that the upper Drigg Stream was never used to dispose of contaminated effluents in the past, only the main watercourse through the site; despite this the construction of the new watercourse has potential to result in changes/surges in flow – how will this affect any

potential for mobilisation of contaminated sediments which will then be deposited in the SAC habitat downstream
- Effect of seismic activity, earthquakes, tremors on vault and sealine pipe and subsequent pollution risk
- Potential for there to be requirement for new sealine pipe or additional and/or repairs to boreholes on SAC as a result of the development

Biodiversity (*Requirement to contribute toward Biodiversity***):**
The application should demonstrate that there is no net loss and preferably a net gain in biodiversity.

Archaeology

Designations
No known archaeological designations will be affected by the proposal.

Surveys
No archaeological surveys required.

Landscape and Visual

Designations
The site is situated within National Character Area 07 West Cumbria Coastal Plain and at a local level it is within the transition of two areas, Low Farmland (LCA 5b) and Dunes and Beaches (LCA 2a), as defined in the 'Cumbria Landscape Classification' (1995) and 'Technical Paper 5 – Landscape Character' published by Cumbria County Council.

Surveys
A Landscape and Visual Impact Assessment will need to be submitted in support of a revised planning application and to inform the Environmental Statement. It is recognised that there have been significant discussions regarding landscape and visual issues during the pre-application discussions. The scope of the LVIA submitted should be as agreed during the pre-application discussions and as set out in the paper *Low Level Waste Repository, Site Optimisation and Closure Works, LVIA Scoping, December 2014, REV B* (URS, 16 December 2014).

Noise, air quality & lighting

Noise & Vibration: A Noise & Vibration Assessment will need to be submitted in support of a revised planning application and to inform the Environmental Statement. Further detailed advice as to the scope of the assessment can be provided at the Scoping stage.

On the assumption that the noise impacts will be similar to those identified in the current live application (4/11/9007) it is understood that for certain periods of time, especially during the Phase 1 construction works, noise from the site would be the dominant noise source or be audible within the area surrounding the site. In considering the live application it is the view of the County Council's Officers' that it has been demonstrated that predicted noise levels would fall within noise limits which are compliant with the NPPG and CMWDF Policy DC2 and could be controlled by

suitable planning conditions.

Air Quality: An Air Quality Assessment will need to be submitted in support of a revised planning application. Further detailed advice as to the scope of the assessment can be provided at the Scoping Stage. It should be noted that air quality impacts (non- radiological) associated with the current live application were considered by Council Officers to be acceptable subject to planning conditions, with the exception of further information being required to consider the impact of dust soiling and air quality on the adjacent SAC.

Lighting: A Lighting Assessment will need to be submitted in support of a revised planning application. Further detailed advice as to the scope of the assessment can be provided at the Scoping Stage. It should be noted that the lighting impacts associated with the current live application were considered by Council Officers to be acceptable subject to planning conditions, with the exception of further assessment being required with regards to the impacts on bats.

Design

Levels
A final design for the cap profile has yet to be submitted, and should be included within the planning application and assessed through the EIA process. Continued dialogue on the proposed design (particularly in respect of the visual and landscape character impacts) prior to finalisation of the design would be welcomed.

Proximity
n/a

Height / Mass
n/a

Materials
The quantities and volumes of LLW proposed to be managed are well understood, however, additional detail is required in respect and types and volumes of material from which it is proposed to complete the cap profile, once the design is finalised. The Authority recognises that there is likely to be a need to retain a degree of flexibility, particularly in respect of material types and the potential to use VLLW and again, ongoing dialogue on the issue would be welcomed.

Sustainability Site opportunities for renewable energy

CMWDF Core Strategy Policy 1 (Sustainable Location and Design) requires that all proposed waste management developments with a gross floor space of over 1000 sq m gain at least 10% of energy supply, annually or over the design life of the development, from decentralised and renewable or low carbon energy supplies. Any exceptions to this should demonstrate that this would not be feasible or viable for the specific development and that the development would form part of an integrated process for reducing greenhouse gas emissions or for carbon off-setting measures.

The County Council appreciate that the actual storage of waste in vaults does not use energy. However, it is considered appropriate that the potential should be assessed for using renewable technology and bio-fuels for the activities and operations associated with the proposed developments.

Geology, soils and hydrogeology

A hydrogeological assessment will be required as part of the Environmental Statement and to support the planning application.

It is noted from the current live planning application (4/11/9007) that a considerable amount of information is available relating to the complex hydrogeology of the site and its surroundings. Further information and/or clarifications relating to hydrogeology may be required to complete the HRA on any revised planning application.

Socio-economic

CMWDF Core Strategy Policy 2 advises that proposals for new minerals and wastes developments should demonstrate that they would realise their potential to provide economic benefit.

The Environmental Statement submitted in support of the current live application included an assessment of socio-economic issues. The application is considered by County Council Officers' to satisfy the objectives of CMWDF Core Strategy Policy 2.

EIA Development (Environmental Impact Assessment required)

Screening

The proposal falls within Schedule 1(Paragraph 3(b)(v) of the Town and Country Planning (Environmental Impact Assessment) 2011 Regulations and is therefore EIA Development.

The applicant should ensure they reference and refer to current legislation/guidance when preparing the EIA.

Scoping

It is understood that the applicant will be submitting a formal Scoping request in due course.

Planning Summary

Plans/Drawings and Documents that ought to be submitted with this application:

- Application Form
- Site-Location Plan (including red line application area and blue line for land under the applicant's control).
- Detailed Proposed Layout Plan
- Phasing plan
- Restoration levels plan
- Environmental Statement (further comments to be provided in response to Scoping request)
- Planning Statement
- Design and Access Statement (optional)

- Statement of Community Involvement

Recommendations: -

The Authority is encouraged by progress made in refining the proposals through dialogue during the determination of the current application 4/11/9007. Through maintaining the current ongoing constructive dialogue in finalising the detail of the revised application prior to its submission, LLWR stand to maximise the likely prospects of a positive and prompt determination.

Prepared by: Iain Fairlamb
Date: 29th January 2015
Revision: 1
Attachments: n/a

Proviso

Prospective Applicants please note

Any advice given by Council Officers for pre – application inquiries does not constitute a formal decision or determination of the Council with regard to any future planning applications or consents.

Any views or opinions expressed are given in good faith and to the best of ability, without prejudice to the formal consideration of any planning application, which will be subject to formal consultation. The determination of any application may be made by the Council's Development Control and Regulation Committee, or as a delegated decision by a nominated officer. The Council cannot guarantee that new issues will not be raised following submission and evaluation of a planning application and any consultations carried out on it.

Council officers cannot give guarantees about the final formal decision made on any planning application. However the advice note prepared for the prospective developer will be considered by the Council as material consideration in the determination of any subsequent planning application, subject to the proviso that circumstances and information may change or come to light that could alter the position. The weight given to the pre application advice will decrease over time with the lapse of any time period between the giving of the advice and the receipt of any subsequent planning application.

Appendix 3: Statement of Community Involvement

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1. Introduction

1.1 This Statement of Community Involvement accompanies a detailed planning application submitted in respect of further development at the Low Level Waste Repository (LLWR) near Drigg, West Cumbria. The application has been made to Cumbria County Council as the relevant Waste Planning Authority (WPA) for the area in which the site is located.

1.2 The application seeks full planning permission for:

The phased construction of additional vaults (10 and 11 and an extension to Vault 9 (9a)); the disposal of low level radioactive wastes in the new vaults and in the existing Vault 9 including the higher stacking of waste containers in Vault 9; the permanent retention (disposal) of waste containers by means of higher stacking in the existing Vault 8; and the phased construction of a permanent capping layer over Trenches 1-7 and Vaults 8-11 and the site of potential Vaults 12-14; together with other ancillary works.

1.3 This application is made following the withdrawal, in February 2015, of a previous full application relating to the same general site area at the LLWR in Drigg. That application sought permission for a larger number of new vaults than is proposed in the current application and was withdrawn following extensive discussions/ negotiations with the WPA n respect of its concerns regarding the long time period over which the proposed vaults would be expected to receive LLW. The new application is much more modest in terms of the additional waste disposal capacity which is being sought on the site at this time and has been revised expressly to respond to the WPA's concerns with the previous application.

1.4 Both the previous and current applications have been prepared in parallel with the Environmental Safety Case (ESC) that underpins and supports the revised Environmental Permit application submitted to the Environment Agency in 2013..

1.5 The applications have been subject to extensive consultation with consultees and stakeholders, and complemented by further consultation undertaken by LLW Repository Ltd as part of its ongoing commitment to stakeholder engagement and as part of the implementation of the ESC. This statement describes and summarises the consultation undertaken and the feedback received.

2. Policy Context

2.1 Community consultation is an important part of the planning system. This section summarises the policy context relating to consultation and stakeholder consultation.

Localism Act

2.2 The Localism Act provides the context within which the planning system currently operates. The Localism Act was given Royal Assent on 15th November 2011, setting out the Government's intention of shifting power from central Government back into the hands of individuals, communities and councils.

2.3 The Localism Act introduced a number of changes of government policy including:

- decentralisation and strengthening local democracy;
- community empowerment; and
- a 're-boot' of the planning system including neighbourhood planning.

2.4 A request for consultation on all types of applications at the pre-application stage has been introduced by the Localism Act. This places a responsibility on developers to:

- consult communities, having regard to any advice that the Host Local Planning Authority may provide;
- consider any responses before the proposals are finalised and submitted to the relevant Local Planning Authority; and
- account for how they have consulted the local community, what comments they've received and how they have taken those comments into account.

2.5 This approach signals the Government's continuing intention to empower local communities through increased community involvement as part of the planning process.

National Planning Policy Framework

2.6 The National Planning Policy Framework (the Framework) endorses the importance of community and stakeholder engagement as part of the planning process. Paragraph 17 of the Framework sets out land use planning principles, which includes empowering local people to shape their surroundings.

2.7 Paragraph 69 also states local planning authorities should create a shared vision with communities to deliver facilities they wish to see. As such Local Planning Authorities should aim to involve all sections of the community in planning decisions...'

2.8 Paragraphs 188 – 191 relate to pre-application engagement. The Framework continues to highlight how early engagement has a significant potential to improve the efficiency and effectiveness of the planning application system. The Framework also states:

Local Planning Authorities have a key role to play in encouraging other parties to take maximum advantage of the pre-application stage. They cannot require that a developer engages with them before submitting a planning application, but they should encourage take-up of any pre-application services they do offer. Authorities should also, where they think this would be beneficial, encourage any applicants who are not already required to do so by law to engage with the local community before submitting their applications.

Local Policy Guidance on Consultation

Cumbria Statement of Community Involvement

2.9 The adopted Cumbria Mineral and Waste Development Framework Statement of Community Involvement (SCI) forms part of the Cumbria Minerals and Waste Development Framework (MWDF).

2.10 The Cumbria SCI is split into two distinct parts. The first is concerned with consultation as part of the process of producing and adopting Local Development Documents. The second is concerned with consultation as part of the planning application process, including both pre-application and post-submission consultation requirements and opportunities.

2.11 The Cumbria SCI encourages applicants to undertake pre-application discussions with officers and consultation with the local community and stakeholders including Parish Councils and site liaison committees.

Copeland Core Strategy and Development Management Policies

2.12 Policy DM1 requires proposals related to the nuclear industry to be developed in consultation with the Borough's community and key stakeholders in accordance with the Council's current adopted approach to stakeholder involvement.

Copeland Statement of Community Involvement

2.13 The adopted Copeland Statement of Community Involvement does not provide any guidance for developers or the promoters of developments in respect of consultation to be undertaken.

3. LLW Repository Ltd Commitment to Stakeholder Engagement

3.1 LLW Repository Ltd's mission is to deliver a sustainable low level waste management service for the United Kingdom. It endeavours to apply a sustainable ethos to all that it does and strives to be an ethically responsible organisation with a positive impact for its communities. It seeks to deliver this through, inter alia, engagement with its local communities, industry regulators and its customers.

3.2 It recognises that effective engagement represents good practice and carries out its engagement using best-practice and seeks to ensure that stakeholders are informed and involved in key LLW Repository Ltd decisions that could impact on them or the wider community.

3.3 Engagement takes place through a range of processes, with a wide range of stakeholders including employees, unions, customers, suppliers, local communities, parish councils, local authorities, governments, regulators, media and the general public.

4. Consultation Undertaken

4.1 This section summarises the consultation carried out by LLW Repository Ltd in respect of the current and previous applications and in respect of the ESC.

4.2 In planning the approach to consulting with the community and key stakeholders over the planning applications, the overarching aim has been to utilise existing stakeholder networks where possible, to ensure understanding of the background to the proposals and of relevant technical issues, and to ensure that the means of consulting was accessible to all, to enable as many people as possible to be involved in the consultation if they wished.

Current Application

4.3 A number of meetings to discuss the revised proposals have been held with the waste planning authority and with representatives of the Drigg and Carleton Parish Council. Statutory consultees including the Environment Agency, Natural England and the County Ecologist have visited the site to gain a better understanding of what is proposed.

4.4 Presentations on the planning application were also given to the LLWR Sub Committee of the West Cumbria Sites Stakeholder Group in March and July 2015.

4.5 A briefing session was held with officers and members of Copeland Borough Council in October 2015 where the proposal was discussed at length and an interactive session with the 3D model was available.

4.6 Regular information and news updates about the planning application have been communicated through the LLW Repository Ltd website and site newsletter 'On the Level' (copies enclosed at Annex A).

4.7 More recently, once the proposals were sufficiently advanced, specific consultation has been undertaken with members of the public, culminating in a public exhibition.

4.8 The exhibition was advertised by advance written neighbour invitation. This approach gave members of the local community the opportunity to view emerging proposals, put questions about the proposals to the LLW Repository Ltd design team and most importantly, give their feedback direct to the applicant and its agents.

4.9 The public exhibition was designed as an informal 'drop in' event that was held in the Drigg Village Hall and took place between 10am and 8pm on Thursday 17th September 2015.

4.10 The period over which the event was held purposely ran into the evening as it was felt that this would enable the maximum number of people to participate in the consultation process and give working people and families the ability to visit the exhibition. The event was held at the Village Hall as it is central to the village of Drigg and the surrounding community and accessible by residents of Seascale, and it was felt that this would provide a venue which anybody wishing to visit the consultation event could easily reach.

4.11 A total of over 1,200 invitation letters to the exhibition were mailed to residential addresses in the vicinity of the application site . A copy of the invitation letter is enclosed at Annex B.

4.12 Attendees were invited to express their views and ask questions to members of the developer team. Representatives of the applicant and the application design team who were present at the exhibition were as follows:

- Cath Giel (LLW Repository Ltd – applicant);
- Any Huntington (LLW Repository Ltd – applicant);
- Andy Baker (Eden Nuclear and Environment – environmental consultant);
- Neil Shaw Hydrock – engineering consultant);
- Lewis Evans (Turley – planning consultant);
- Ian Campbell (Aecom – environmental consultant);
- Max Aremia – (3DW – computer modeller).

4.13 Attendees were also invited to complete and submit questionnaires / comment forms regarding the proposals to enable their views to be recorded. A copy is provided at Annex C. Copies of the questionnaire were available at the exhibition for people to take away for later completion and return by post or email, or to complete and submit at the event.

Exhibition Material

4.14 Information about the site and the draft development proposals was provided on a series of 10no. A1 exhibition display boards. Copies of these are enclosed at Annex D to this report and comprised:

- No.1 – Introduction giving details about LLW Repository Ltd and the site
- No.2 – Waste Diversion
- No.3 – Details of the Environmental Safety Case
- No.4 – Overview of relevant policy
- No.5 (5a and 5b) – Details of the proposals
- No.6 – Construction phasing
- No.7 – Summary of the landscape and visual impacts
- No.8 – Details of construction management
- No.9 – Details of how to provide feedback on the proposals to LLW Repository Ltd

4.15 The aim of the boards was to help the local community understand more about the site and LLW Repository Ltd, the site history and context, the rationale behind the proposed redevelopment, the key technical considerations which would inform the development, and the development itself including its appearance, construction phasing and controls over construction to minimise disturbance. The boards were designed to be informative and easily understood and were an important tool in ensuring the local community was fully informed about the proposals and able to draw their own views and conclusions about the development, whether they supported it or not and what they liked and disliked about the proposals.

4.16 A three-dimensional computer model of the proposed capping works was also displayed and enabled local residents to see the proposals from any chosen viewpoint thereby providing an accurate representation of the potential impact of the development.

4.17 Whilst these materials and the exhibition events have provided useful feedback on the proposals, this does not represent the end of the community consultation process and the planning authority will undertake its own statutory public consultation on the proposals once the planning application is validated.

Withdrawn application

4.18 The format for the consultation event followed that undertaken for the previous (now withdrawn) application for the longer term application which included Vaults 9a – 14.

4.19 With regular liaison, reporting and presentations to the West Cumbria Sites Stakeholder Group LLW Sub-Committee and regular communicated through the LLW Repository Ltd website and newsletter.

4.20 A public consultation event also took place in March 2011. The event was publicised to around 500 residents within the local area and was held over two sessions, including one evening and one full day (8am to 8pm), with members of the project team, including representatives from LLW Repository Ltd attending.

4.21 The exhibition material used was similar to that used for the current application. Copies of the exhibition boards together with details of how to provide feedback were provided on the LLW Repository Ltd website[5].

4.22 Following submission, the application was subject to a number of meetings with CCC and statutory consultees. CCC officers, statutory consultees and members of the Development Control Planning Committee specifically visited the site to better understand the proposals.

4.23 The application was withdrawn prior to determination.

Environmental Safety Case (ESC)

[5] http://www.llwrsite.com/llw-strategy/planning-application

4.24 Separate consultation and meetings have been held in respect of the ESC and the environmental permit application. These meetings have been held with the Environment Agency, as the regulatory body, and the Drigg and Carleton Parish Council Parish Council. Over 40 meetings with the Environment Agency and nearly 50 meetings with the liaison committee of the Parish Council have taken place.

4.25 The principle purpose of the meetings with the regulator, during the development of the ESC, was to present and discuss proposed approaches, for example, methodologies for calculating radiological and other impacts. During the Environment Agency's review of the ESC, meetings focused on providing answers to issues raised by the Agency.

4.26 An open day on the permit application took place in June 2014 and enabled members of the public to air any concerns or issues with the environmental regulator, gain a better understanding of the operation of the site and the regulatory framework to which it must adhere.

Other Activities

4.27 In addition to the consultation on the planning applications and the permit, a series of open days have taken place since 2011. Such events have enabled different stakeholder groups to meet LLW Repository Ltd employees and obtain more information about the site, its current operations and future direction of travel thus affording the community a better understanding of the role of the LLWR.

5. Feedback Received

Withdrawn application

5.1 Feedback received was generally positive, although comments were received about the construction impacts and the need to carefully control development. This feedback was been reflected in the proposals as they have evolved and an emphasis placed on how these issues were to be addressed when preparing the exhibition material.

5.2 A total of 9 comment sheets were returned by attendees at the exhibition or subsequently returned by post or email. Unanimous overall support was received for the redevelopment proposals

5.3 All of those people who returned completed comment forms and those attending the events, having spoken to members of the applicant team, were fully supportive of the proposals and recognised the importance of the development.

5.4 In general, feedback given to the applicant team at the exhibition recognised the limited visual impact of the development, particularly by those who viewed the computer model of the proposals.

5.5 Questions posed on the comment forms or presented to attendees at the exhibition event, asked people to give more detailed views on the redevelopment proposals, including what issues, design details or technical matters were important to them. The key points highlighted issues around residential amenity, visual impact and biodiversity.

Current Application

5.6 A total of 23 people attended the event with those attending predominantly comprising of residents from Drigg, Seascale and Holmrook.

5.7 A greater level of responses was received in comparison to the previous application, with 10 feedback forms completed. As with the previous application, discussions with those attending (who did not complete feedback forms) confirmed support for the scheme.

5.8 All of the responses received, confirmed support for the scheme. A number of detailed issues relating principally to the construction were raised in some of the feedback forms. These issues are considered further in Section 6.

6. The Applicant's Response

6.1 LLW Repository Ltd welcomes the feedback received, particularly that on the current proposals. It is encouraged that again, 100% support has been received, and considers that this reflects the importance it places on ongoing efforts to involve and engage with stakeholders.

6.2 Following consideration of the detailed comments made by some of those attending the exhibition, summarised above, its response is as follows.

Table 6.1: Summary of Detailed Comments Received

Issue	No. of Times Raised	LLW Repository Ltd Response
Dust impacts	3	Dust and noise mitigation is specified within the Environmental Statement and will be incorporated within a Construction Environmental Management Plan (CEMP). The CEMP will include a comprehensive range of best practice measures and can be secured by condition to further reduce the impact during the construction periods Construction hours will be limited to 0730 – 1800 (Mon-Fri) and 0800 – 1300 on Saturdays with no working permitted on Sundays or Bank Holidays. These measures are considered to provide an effective suite of mitigation measures that will ensure no unacceptable impact on residential amenity will arise.
Noise impacts	3	
Reasonable working hours	1	
More local jobs to be provided	2	Employment will increase by approximately 70 Full Time Equivalent (FTE) positions between 2016 and 2017 (with the number falling beyond that). Beyond the operational phase through remediation up to site closure, direct employment will range from 40 – 60 jobs per annum. The vast majority will continue to be based in Copeland and West Cumbria. Access to training schemes, apprenticeships, professional qualifications, workforce development and education will continue to take place, with number of local people benefitting increasing proportionally, in line with the increase in employment outlined

		above.
Should be fully and properly screened, with trees close to Stubble Green to be retained	1	The first phase of the landscape cap around the northern and eastern perimeter of the site and will provide screening once complete. The extent of screening will be increased once the replanting re-establishes (on a timescale of around 10-15 years). The trees which provide screening of the site from Stubble Green, including trees on the LLWR site (to the south of Trenches 1 – 7), and trees beyond the LLWR site along the railway line will be retained.

6.3 It is considered that the planning application, including any necessary mitigation measures outlined within the Environmental Statement and supporting documentation will ensure that the comments received at the public exhibition are fully addressed.

6.4 LLW Repository Ltd will also review any representations submitted to Cumbria County Council following the submission of the planning application and will respond as necessary. This will include consideration of any further mitigation measures considered necessary.

7. Summary and Conclusion

7.1 This Statement of Community Involvement summarises the pre-application consultation undertaken with the local community and stakeholders by LLW Repository Ltd, in support of its planning application for the site optimisation and closure works at the Low Level Waste Repository at Drigg, West Cumbria.

7.2 It demonstrates that a range of engagement and consultation methods were employed in respect of both the withdrawn and current proposal, including an extensive programme of meetings and events, public exhibitions of the proposals, an extensive mailing to neighbouring villages, and a scheme website. Wider community engagement has also taken place as part of ongoing stakeholder engagement by LLW Repository Ltd and specifically relating to the ESC.

7.3 The extensive period of consultation has generated a successful level of active interest and local participation in the scheme proposals and generated a helpful degree of feedback and comment. The results were overwhelmingly positive and showed a high level of general support for the redevelopment proposals amongst the community, although a number of detailed issues were raised.

7.4 These have been fully addressed and taken into account by LLW Repository Ltd in the submitted application.

Annex A: Copies of LLW Repository Ltd Newsletter

Red Nose day brings Red faces to LLWR

Staff decide to raise money for Comic Relief– Red Nose Day 2011

The Comic Relief moustache gang

Every year, LLWR employees join the rest of the country and participate in fundraising activities to support Comic Relief Red Nose Day. This year they decided to really enter into the spirit of Comic Relief and challenge male members of staff to grow the silliest, hairiest, and most extravagant moustaches they could. We encouraged colleagues, family, and friends to sponsor them for their efforts with all proceeds donated to Comic Relief Red Nose Day.

Within days, the list of volunteers reached 28 and one member of staff even volunteered his wife!

The clock was set and on Friday, 18th February the guys were given four weeks to nurture their moustaches. You can imagine the various stages of growth our finalists endured – from 6 o'clock shadow, stubble, unkempt, scruffy, and scary to downright menacing. Believe it or not, for some it was a vast improvement!

At last the day of reckoning was upon us - Friday March 18th. Votes were cast, counted, and verified. The level of competition was fierce. No lobbying tactic was too low for these guys, having endured the ridicule of nearest and dearest. They were clearly in it to win !
And the Winner is ……..Head of Business Development, Dennis Thompson – Hurray!

Winner Dennis Thompson being presented with the Mr Potato Head trophy by Jim Carnall

The tremendous efforts of our moustache growers coupled with additional fund raising activities across the site raised the staggering total of £1,562.33. As a goodwill gesture, the company donated a further £437.67 taking the grand total to £2,000.00. Well done Team!

A Big thank you also goes to Jim Carnall, Ali Pekarek, Julie Sweeney and Amy Fallows for organising and co-ordinating the fundraising activities.

ESC Facts and Figures

Below are some of the key facts and figures used to produce the LLWR Environmental Safety Case.

People	From the start of the project, to date about 80+ people have been involved.
	We estimate 85 man-years of work has gone into the Project.
Boreholes.	Earliest borehole data is from 1939.
	Over 650 boreholes have been constructed in total.
	91 boreholes constructed since 2002.
Monitoring.	Monitoring data base (over 30 years) holds about 230 000 results.
	45 000 samples collected in the last 2 years
ESC to date.	Have about 300 underpinning reports.
	About 150 project memo's.
	About 210 recorded meetings
EA liaison meetings.	We have had about 50 liaison meetings with the EA.
Final ESC documentation.	Level 1 and level 2 reports comprise of about 2000 pages.
	Level 3, the key underpinning reports, comprise about 9500 pages
Printing	And….. its going to take 60+ hours to print out all the copies the EA require on 1st May.

LLW Repository Ltd

ON THE LEVEL

ISSUE 8 APRIL 2011 NEWS AND VIEWS FROM THE **LLW REPOSITORY**

Directors Corner

Dealing with our number one risk - securing a long-term waste disposal authorisation from our UK regulator- the Environment Agency (EA)- is crucial for long-term continued waste management operations at the LLWR.

Back in 2006/2007, as part of the LLWR bid process, our management team spent considerable time working to understand the future plans for LLWR. If the facility's capability and value were to be maximised, then the most important enabler was having a robust, well-informed Environmental Safety Case (ESC).

The ESC assessment and detailed analysis are **THE ARGUMENT** that underpins safe utilisation of the site going forward beyond Vault 8. Without a sound safety case, there simply is no future for the site and the UK taxpayer would be facing the daunting challenge of finding, building, licensing, and permitting an entirely new repository.

We have been working closely with the EA for over two years, keeping them abreast of our technical approach and results of the numerous modelling and analytical results for the ESC. Now comes their key regulatory role to review and evaluate our submission of the ESC.

We believe this new ESC provides that sound justification for continued use of LLWR. Please take the time to read all of the articles about this effort and get a good look at the future of this important national resource.

Dick Raaz
Managing Director

What is a Safety Case?

If you have had any interaction with the LLWR over the past 3 years, then you have heard about the importance of the ESC. But what is the ECS and why is it so important

The LLWR has spent an enormous amount of manpower and funding to develop something called an Environmental Safety Case (or ESC). As submitted to the Environment Agency on May 1st, this document is nothing short of 2000 pages of technical arguments and complicated scientific studies explaining how and why it will be safe to dispose of Low Level Nuclear Waste (LLW) at the Repository, not just for the current generation, but for the generations to come - long after us. *The basic remit of the ESC is to present a sound case for the disposal of LLW at the Repository near the village of Drigg demonstrating that the effects of the Repository are within current environmental guidelines, not just now, but for thousands of years.* The analysis must cover **all** the waste which includes both the waste that has been disposed in the trenches that dates back to the 50s and the waste that has yet to be generated and managed at the Repository.

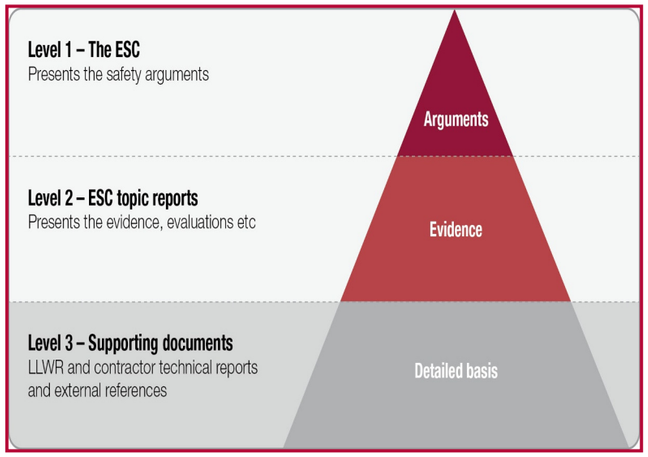
It doesn't take much of an imagination to determine how difficult this task really is. One cannot assume that the waste will stay inside the trenches (or inside a grouted ISO) for several millennia; the waste is going to move. Therefore the ESC must determine how, where, how much, when, and where it will end up. This involves the quantification of the radiological makeup of the waste disposed, calculations that determine the natural decay of these products over time, the development of complex 2 and 3 dimensional models to determine the rate and pathways of the waste migration, complicated groundwater models, a determination on the effects of global warming and coastal erosion, and of course, the effects of what future generations will do long after they may have forgotten about the LLWR. All of this must be researched, analysed, peer reviewed, and then conclusions drawn. The general objective is to demonstrate that the Repository is safe now and "forever" and to show this with a risk better than 10^{-6} (that's 1 in a million!).

Why do we go through all this work?
There are multiple answers to this question. The cynic would say we are doing it because it is the law. This is true, but the real reason for this gargantuan effort is because the Repository, the NDA, and the EA are willing to go through great lengths to ensure that today's activities are not just safe, but really safe for the generations to come. It is our ultimate responsibility.

East view of Drigg Village

Understanding the ESC

The Low Level Waste Repository (LLWR) is the UK's principal facility for the disposal of solid low-level radioactive waste and has provided a continuously authorised route for disposal of LLW since 1959. We are regulated by the Environment Agency (EA). Under the terms of our current LLWR Permit granted by the EA, we are required to submit an Environmental Safety Case (ESC) for the LLWR by 1st May 2011.



The ESC consists of documents at two levels, with a third level of supporting material

The ESC:

- presents the arguments and evidence concerning the environmental safety of disposals of solid radioactive waste at the LLWR, at present and into the future, consistent with the EA Guidance on Requirements for Authorisation (the GRA);

- provides a basis for the environmentally safe management of the site by the SLC, and regulation of the site by the EA, including setting of conditions on its future management and acceptance of waste.

The ESC is addressed primarily to the EA and is intended to inform and enable their regulation of the LLWR. It also provides a plan for the future management of the LLWR and a baseline against which proposed changes in the plan for the development of the facility can be tested. As such, it will be of interest to our other stakeholders, both local and national.

Our objective has been to develop and present an ESC that demonstrates that it is safe to continue to dispose of LLW at the LLWR. The ESC covers environmental safety both during operations at a facility and after closure, for however long the wastes will remain a potential hazard.

The overall results of this comprehensive ESC assessment are:

- The 2011 ESC meets the requirements in the EA's guidance;
- It is safe, both now and in the future, to continue to dispose of LLW at the site;
- Controls to ensure mid-term safety and environmental protection may be required for approximately 300 years after LLW disposal operations cease;
- Coastal erosion of the site will eventually occur within approximately 1000 years, but impacts will be minimised at LLWR through normal radioactive decay and dispersal into the environment;
- To ensure safety, we must make sure that we only accept wastes with properties consistent with the assumptions in the ESC.

Spotlight on Excellence

Dr Amy Huntington : ESC Technical Specialist

Amy has been working at the LLW Repository since June 2009, working as a Technical Specialist and a key member of the ESC Team. Amy has a university degree in General Physics and a PhD in Atomic Physics which she received after studying for 7 ½ years at Newcastle University.

Amy was nervous about starting work at LLWR because it was her first job following her university studies and she had no experience in the nuclear industry. Her fears were unfounded, and the team has made her very welcome. She has settled in with ease.

Over the past two years, Amy has found herself on a steep learning curve. She is now more conscious of the things she doesn't know rather than what she does know. She says that one of the hardest things she has had to do was to deliver a presentation to LLWR staff at the Communication Forum last year. Nerves kicked in as she found herself in front of staff who had been at LLWR for many years and who had lots of site experience. Two years into the job, Amy still finds this one of the harder parts of her job, as she is more comfortable with the technical work.

Amy is particularly proud of the work she does with an independent ESC Peer Review Group made up of renowned specialists in the fields of environmental science and engineering. She said "the group work very well together and have provided a strong, independent challenge as the ESC has developed".

Although Amy was born and bred in Wigton, she supports Newcastle Falcons Rugby Union Team – a legacy from University days. She also likes walking and shopping!

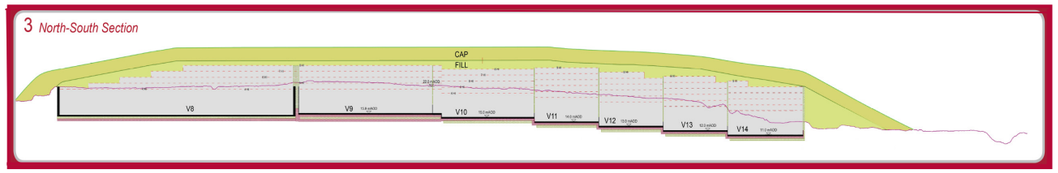
Planning for the future

Twin tracking two of LLWR's major projects, the Environmental Safety Case and the Site Optimisation and Closure planning application, is essential to provide the level of clarity and understanding required to secure the relevant and necessary permissions for continued operations at LLWR.

Running in parallel with the Environmental Safety Case (ESC) is work on an overarching planning application that captures all developments associated with the provision and closure of the LLWR facilities from present day to 2080, providing visibility and clarity for the operational lifetime of the site. The two projects are integrally linked – we cannot make the safety case without approval for the trench and vault cap and we cannot implement the capping project without a disposal permit based on approval of the ESC – both authorisations need to be in place to allow development of the site for low level waste disposal to continue.

The application includes:

- Permanent retention of Vault 9 for the disposal of waste (currently approved for storage only).
- Permanent and extended higher stacking in Vault 8 (currently temporary permission to 2013 only).
- Construction and operation of future Vaults 9a to 14 for the disposal of low level waste.
- Phased capping of the trenches, existing vaults, and future disposal vaults.
- Installation of a cut-off wall and secant pile wall, essentially underground barriers and supporting structures in the disposal area.



We are in discussions with the Waste Planning Authority, Cumbria County Council, about appropriate break points in the phasing of ESC implementation to allow for changes in policy, technology, forecasts and to provide comfort for stakeholders, giving them the utmost confidence that interventions can be made should it be deemed necessary.

The submission of an overarching planning application does not relieve LLW Repository Ltd from the substantial work that will precede each phase of implementation (mini-planning applications), nor does it preclude applying lessons learned and striving for continuous improvement at the site. We have spent the past two years improving the design of any future vaults and engineering the final closure of the Repository.

We are keen to understand stakeholder concerns or issues and have begun a round of stakeholder group discussions to brief them on the overall scope of the planning application and its component parts. We have also held a two-day public exhibition at Drigg Village Hall to keep local residents up to speed with our plans. We have issued fliers and dedicated a section of our web site (www.llwrsite.com) for public information and comment on our proposals.

Site preparation

BEFORE

Phase 1 (2013 - 2015): Enabling operations and site works will take place prior to the main construction phases. This includes the removal of boundary planting around the north of the Repository including the eastern boundary facing Stubble Green, the formation of the cap 'shoulders' and the first phase of capping. Combined with additional and early planting, this will provide visual and acoustic screening for later phases.

Other works include installation of the cut-off wall to the north and west of Vault 8 and diversion of Drigg Stream.

AFTER

Phase 8 (2078 - 2079): Work within this phase is limited to the importation of capping and profiling materials and the capping of Vault 14 and the adjacent trenches. It represents the final phase of capping, with the landscaped cap in its final form.

Capping Vault 14 and adjacent Trenches

LLW Repository Ltd

ON THE LEVEL

ISSUE 9 | SEPTEMBER 2011

NEWS AND VIEWS FROM THE **LLW REPOSITORY**

Directors Corner

Holding steady course on a new vision for UK waste management

When UK Nuclear Waste Management Ltd (the Parent Body Organisation for LLWR), took over on 1st April 2008, the UK was facing some serious challenges in managing low level radioactive waste. Vault 8 was nearly full, there was no planning consent for construction of a follow-on vault, there was an incomplete plan relating to delivery of the safety case which is essential to support continued use of the Repository beyond Vault 8 and, most importantly, there was no National Strategy that would manage this waste through the decommissioning of the first generation nuclear plants. In short, the UK was way behind the international community in getting to grips with a very important aspect of nuclear decommissioning.

Today we have a brand new Vault that can easily manage the waste needs of the industry for the next decade. We have submitted a comprehensive Environmental Safety Case that should enable a new disposal permit by 2013 and provide for a Repository for the better part of this century. And, under the leadership of the Nuclear Decommissioning Authority (NDA), the UK now has an approved National Strategy for the management of low level waste. LLWR is leading on the implementation of that strategy across the UK - for NDA and other nuclear industry consignors. The strategy implements the Waste Hierarchy placing emphasis on minimising waste generation, maximising waste treatment options and resorting to disposal as a last resort. We are also hard at work improving shipping and disposal containers, providing standardised characterisation services and offering metal recycling, combustible treatments and Very Low Level Waste alternate disposals. The combination of all of these offerings brings about our 3 steps to success: reducing volume; increasing capacity and improving forecasts which you will be able to read more of in the centre section of this newsletter. We are confident that with much less waste coming to the Repository, the UK should be able to complete Generation One Decommissioning.

Optimised disposal of Bradwell Skips and Berkeley Boiler Treatment

LLWR has been working closely with Magnox Ltd on a number of projects in recent months; namely the optimised disposal of the Bradwell Pond Skips and the Treatment of the Berkeley Boilers

The pond skips from Bradwell, have been stored at the station in 16 Half Height ISO containers since removal from the pond several years ago. Unfortunately the skips are not suitable for metal treatment and are destined for disposal. You may think that this is the end of the story… However, there is a significant voidage (waste of space), of approximately 90%, with the direct disposal option and it does not represent the best use of capacity at the Low Level Waste Repository.

LLWR, engaged the supply chain, through its Metallic Waste Treatment Framework contract, and asked them to come up with alternative solutions. Energy Solutions, with partners Inutec proposed that the voidage in the containers was used for other low level wastes, with the repackaging of the containers taking place at Inutec's facility at Winfrith. This has reduced the voidage to 30%, and by using other low level radioactive waste to fill the voidage has resulted in saving approximately 10 containers worth of space in the Vault. LLWR has been managing the overall project for Magnox, with the first two successfully optimised containers arriving at LLWR in late July.

At Berkeley, Magnox is working with the NDA to accelerate the removal and treatment of 15 redundant boilers (heat exchangers) from the site for metal treatment. The remaining boilers will be treated over the next two years. LLWR and Magnox are working closely together to procure a service from the supply chain to lift, transport, treat and dispose of the boilers through the Metallic Waste Treatment Framework.

Three steps to success

There are three key areas of activity that when combined, could eliminate the need for a second low level waste repository, saving approximately £2 Billion, and ensure optimal use of the existing facility at the Low Level Waste Repository (LLWR). Through volume reduction, increased capacity and improved forecasts we are confident that the life of LLWR can be extended to meet both the needs of the NDA's decommissioning programme and the Nation over the next century.

Reducing volume

Through our Waste Management Services we have implemented new treatment and disposal options to reduce the volume of waste coming to the LLWR.

Since we introduced our recycling service for metallic waste we have treated over 1,000 tonnes of metal, releasing 95% back into the commercial market and reducing the volume destined for disposal at the Repository by the equivalent of 100 containers thereby extending its life by 3 months. As this treatment route becomes more established we anticipate an overall reduction of up to 500,000 tonnes over the lifetime of the facility.

In addition to metals recycling we have initiated a combustible waste treatment service that could ultimately see over 112,000 tonnes of materials diverted from the Repository. We are also developing a very low level waste (VLLW) disposal service to support customers managing high volumes of very low level radioactive waste. Government policy on managing VLLW allows a more flexible approach, including the option to dispose of this waste in suitable landfill sites. By segregating this type of lower activity waste – soil and rubble from the decommissioning programme - the capacity at LLWR can be preserved for waste that requires highly engineered Vaults. It is anticipated that this will deliver a volume reduction of approximately 3.5 million tonnes.

Developing new containers for disposal at the LLWR is also a key element in the volume reduction objective as increasing the amount of waste in each container will reduce the overall volume when the waste is placed in the vaults. We are working on more efficient containers that will achieve this by allowing containers to be stacked closer together and support customers to improve waste packing by giving them more accessible space within the container.

Increasing capacity

Providing additional capacity for the management of low level waste is a key feature of the National Waste Programme. We recently opened Vault 9 which will meet the UK's needs for the next 10 years however, the UK's requirements span many more decades and further vaults will be required.

A Site Optimisation and Closure Planning Application has been submitted to the Waste Planning Authority at Cumbria County Council which provides a strategic overview of the different phases required to efficiently and effectively manage the operational lifetime of the site, this includes:

- The permanent retention of Vault 9 for the disposal of waste (currently storage only);
- Permanent higher stacking in Vault 8 (currently temporary permission to 2013);
- Future Vaults 9a to 14 for the disposal of waste;
- Phased capping of the trenches, existing vaults and future vaults;
- Installation of a cut-off wall and secant pile wall;
- Progressive restoration to grassland in parallel with the phased cap construction

This planning application is aligned to the Environmental Safety Case (ESC) which underpins all activities at LLWR and makes the case for continued operations at the site. We have spent the last 3 years building this Safety Case and covered everything from data collection and analysis to coastal erosion and climate change forecasts. The Safety Case looks at impacts many years into the future and provides assurance that the site is safe both now and for centuries to come. We submitted our ESC to the Environment Agency in May this year. There now follows a two year review period but this is not the end of the work, it is only the beginning!

Improving forecasts

Irrespective of the nature of a business, accurate forecasts and projections are essential to deliver success!

The UK Radioactive Waste Inventory is the "bible" we use to underpin future plans and inform investment decisions. Every SLC in the nuclear estate feeds their predictions into the Waste Inventory database. Our National Waste Programme Team has been working with Magnox and Sellafield to re-assess previous assumptions about volume and the activity level of their waste streams.

Working closely with our customers, we have been able to improve the accuracy of the Radioactive Waste Inventory. This has led to the identification of up to 2,100,000m3 of exempt waste within the total estimate of 4,400,000m3 and was achieved through a combination of measures, plant walk downs and data validation.

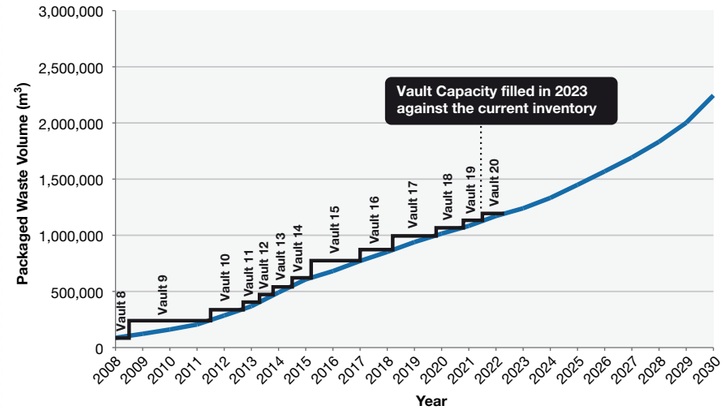
This approach will continue to be rolled out estate wide and should provide clarity for SLC's, LLWR and the supply chain on who is sending what by when and allow better planning for the future. We also hope that this work will continue to improve the accuracy of the inventory and may ultimately mean there is less waste to manage than we currently think.

LLWR Services

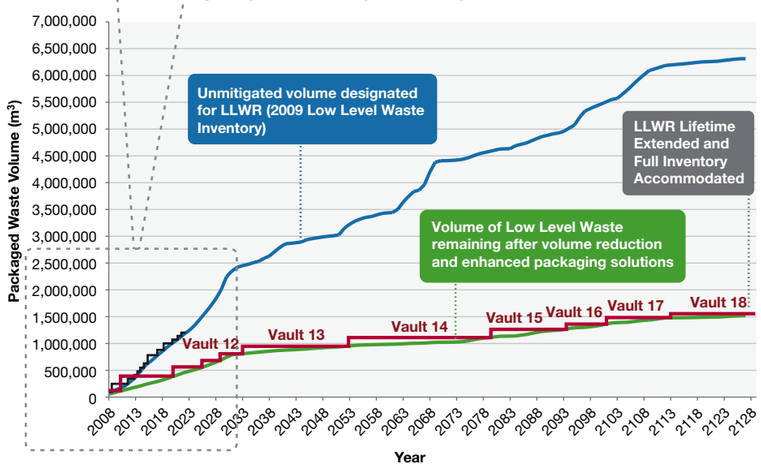
- P packaging
- T transport
- W waste characterisation
- M metallic
- C combustible
- S supercompactable
- V very low level
- L low level


Vault 9

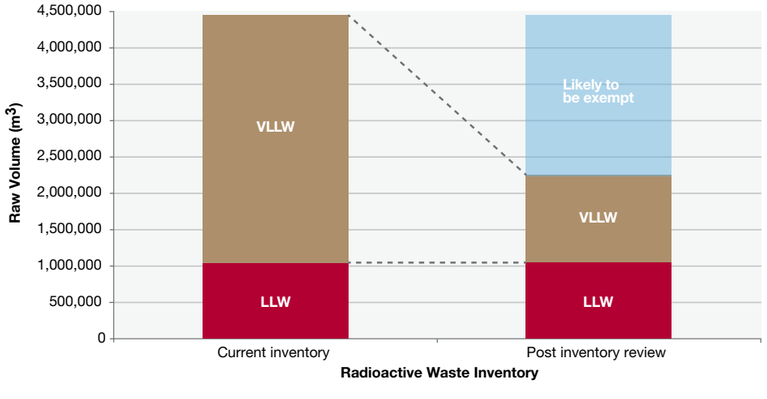
The Problem – Repository full by 2023



The Solution – Site capacity extended by over 100 years



The Key – A better understanding of waste forecasts



Interview with
Joanne Van Straaten

The Nuclear Decommissioning Authority (NDA) was set up by Government in 2005 to deliver safe and cost-effective decommissioning and clean-up of the UK's civil nuclear legacy.

As the owners of 19 nuclear licensed sites across the UK, it was clear to the NDA that in order to deliver their mission, fundamental changes would have to be made. The LLWR was identified as both a critical enabler and potential bottleneck for operations and decommissioning activities across the NDA estate. So to ensure continued capability and capacity for LLW management and disposal, NDA sought to bring in world-class international expertise capable of mitigating the risks and acting as a change agent in operational excellence and culture.

A contract to manage and operate the LLWR and to assist NDA as a strategic partner in the development and implementation of the National Low level Waste Strategy was awarded in 2008. Joanne Van Straaten, National Programme Manager for Low Level Waste was instrumental in developing the contract specification and involved in the selection process.

Since 2008, Jo has been the driving force behind the development of the National Low Level Waste Strategy, which received government approval in August 2010, and heavily involved in its implementation since its inception. To say it is a topic close to her heart would be an understatement. Jo explains that the strategy has three strategic themes: application of the waste hierarchy (avoid, reduce, recycle, re-use, dispose); gaining the best use from existing waste management assets; and encouraging the development of new, fit-for-purpose waste management routes. She says "it's not rocket science but it does require an integrated approach across all the sites, management buy-in and workforce commitment and application. We're asking for a change in low level waste management practices – business as usual is unacceptable and quite frankly unsustainable."

Whilst considerable progress has been made, Jo is under no illusions about the task ahead to implement the National LLW Strategy. She recognises the importance of broadening the consigner support role and opening up new waste routes. She also understands how important it is to build relationships, understanding and confidence. She wants LLWR to be the 'remediator of choice' for LLW services, advice, and knowledge but says "like respect, it has to be earned". She is confident that the contract has been placed with the right consortium and cites a number of successes. Jo is complementary when she says "I can't think of one thing you haven't delivered".

Implementation of the LLW National Programme is one of the NDA's top 10 projects/ programmes. It may not have the profile of the high hazard work at Sellafield but it is no less important as it enables all of those other activities to take place. Defining success for a programme spanning 120 years could be perceived as daunting but not for Jo Van Straaten, she's quite clear:

1) **ensure LLWR matches the life of the mission and that UK tax payers never have to face the £2 billion burden of a second LLW repository;**
2) **change the basis of waste forecasting to produce accurate, robustly underpinned plans across the nuclear estate to inform and support timely business decisions.**
3) **NDA delivering on a policy commitment to government – doing what we say we are going to do.**

In summing up Jo's attitude and approach I'd say she is a very knowledgeable, confident, result driven person who knows her subject, understands what's required and wants to get on with it. In the words of this very feisty lady "we need to get on and just do it"!

LLW Repository Ltd

Low Level Waste Repository Site

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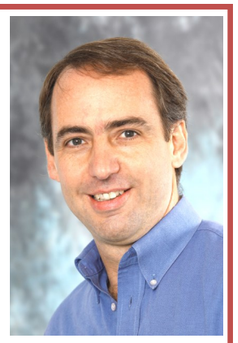
View from the top



Before writing this column I had the luxury of reading through the draft of this newsletter, and I must admit that every time I read about the things our people are doing, I am left with the same impression: we have a fantastic workforce.

This particular edition highlights just a small proportion of our organization, but it is indicative of the calibre of people that we employ. I would like to make a few observations about LLWR as it is today.

Since 2013 our scope has increased by 50%. That's an overwhelming statistic because at the current rate of escalation we will have almost doubled the work we were delivering prior to 2013.

Our strategy to deal with this dramatic increase in work load has resulted in:

- The recruitment of additional LLWR staff. This has been a very rewarding process as we have been able to find very competent and enthusiastic individuals who are willing to come on board. However, this increased workload will not be sustained beyond the 2018 timeframe, and so we have had to ensure that we only "staff up" to our steady-state work levels and factor in durations for project work.
- The recruitment of ASWs (Agency Supplied Workers) to provide the required staffing for this interim period. Our normal operations include about 10-12% ASWs, and I expect that percentage to rise to around 25% by the summer of 2015.
- The development of strategic partnerships. We have two, and both partners are highlighted in separate articles in this newsletter. Almost 2 years ago now, we selected NSG as our decommissioning partner, and during that time we have made excellent progress. Just before Christmas we selected Graham Construction as our Engineering, Design, and Construction partner. We have welcomed both companies into the LLWR family and expect them to adopt our values, live up to our standards and to function in our local community in much the same way we expect our own employees to.

An outsider might look at the huge workload and challenge ahead and wonder whether or not we will be able to pull it off, but they don't know what I know... we have a fantastic workforce!

Dennis Thompson

Managing Director

New forum for Gareth

Gareth Garrs has joined an important new UK-wide team working on improving the quality of waste data.

The Waste Inventory Manager is representing LLWR on the National Inventory Forum (NIF), which includes representatives from across the nuclear sector, and was established to co-ordinate collection of the vital waste data that underpins a range of nuclear activities.

The NIF's primary aim is to improve the collection of data required for the national inventory that is currently updated every three years, the UK Radioactive Waste Inventory (UKRWI).

Inventory data is used to inform strategy development and waste management planning, underpin safety cases and inform product and service design, development and delivery.

It is also used to form the basis of a range of contractual agreements and is considered by Waste Planning Authorities in the development of their mineral and waste development plans.

An updated UKRWI is due to be published in 2016, and work on data collection will begin this year.

"It is essential that the waste data we collect from across the UK is robust, efficient and meets the needs of the Repository," said Gareth, pictured above.

"Being part of this forum enables LLWR to influence the level of detail required in the data we collect, tools we use to collect it and to re-enforce those requirements to a wide variety of key industry decision makers."

Another chance to say hello

LLWR is following up the success of its Community Open Day in October last year with a second event in April. Last year's event was over-subscribed, so the company pledged to host a second, giving employees, their families, key stakeholders and near neighbours the chance to learn more about LLWR and its future plans.

The day will start at 10.30am, with a short presentation, followed by tours of Pelham House and the LLWR site, and conclude around 2.30pm. A light buffet lunch will be served between noon and 1pm, and, as last time, family-friendly attractions will keep the kids entertained.

Visitor passes must be issued in advance to those planning to take part in the Saturday, 18th April event. Reply slips are being sent to local residents and must be returned on or before Friday, 20th March. Alternatively, contact one of the following to register your interest:

Donna Glasson at donna.i.glasson@llwrsite.com or Martin Morgan at martin.j.morgan@llwrsite.com. Also available on 019467 70225.

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LLW Repository Ltd

ON THE LEVEL

Edition 3 March 2015

NEWS AND VIEWS FROM THE **LLW REPOSITORY**

Working together: David Saul, Programme Manager Repository Development, far left, greets Graham Construction trio David Slevin and Jack Walker, Senior Project Managers, and Construction Manager Billy McNeilly.

New partner keen to secure engagement with community

LLWR's major new partner Graham Construction is hoping to produce a lasting legacy in the area after speaking to residents at a Meet the Contractor event.

The company was recently appointed as the Engineering, Design and Construction (ED&C) Framework contractor, a key element of the LLWR project delivery strategy. Locals braved bad weather to turn out at Drigg Village Hall, where they learned about projects planned for the Repository, as well as job opportunities and plans to co-operate on a community project with LLWR and potentially other partners.

A wide range of presentational material was provided to the Open Night audience, detailing the history, capabilities and experience of both Graham Construction and LLWR, together with details of strategic work programmes covering security enhancement, site infrastructure and Repository development.

"It was a great opportunity for LLWR and Graham's to meet the community," said Nuala Griffiths, Community Liaison Manager with Graham Construction. "As part of our Responsible Business Programme we have developed a Community Engagement Strategy that sets out how we engage with the communities where we work.

"Community liaison and engagement are essential parts of any project delivery process. On the LLWR Project, communication will be the key to effective stakeholder engagement. LLWR and Graham thought it was important to give the local residents a chance to meet with the teams and discuss the project and listen to any concerns they may have.

"This was welcomed by the residents and proved to be a successful night, creating a good relationship and understanding of the project and showcasing the people involved. This always helps open the gates for future communication if they have any issues that may rise throughout the project." Dave Saul, Programme Manager Repository Development, highlighted LLWR's plans to work closely with Graham's. He said: "Staff from both organisations will be co-located on the Repository site and will work together as an integrated project team supported by a variety of local contractors that form part of the Graham ED&C supply chain."

Summer hope for LLWR's planning submission

LLWR hopes to submit a fresh planning application for the Repository site this summer.

The company decided to withdraw its long-term planning application in favour of pursuing a shorter-term application with the Waste Planning Authority, Cumbria County Council.

Since June last year a number of workshops have been held with the County Council and many discussions have taken place to try to address issues and resolve differences of opinion.

Dennis Thompson, LLWR Managing Director, said: "It has taken considerable time and effort but we have finally agreed the scope for a shorter-term planning application that meets the mid-term needs of LLW Repository Ltd and fits with Cumbria County Council's planning policy framework.

"We hope to be in a position to submit this shorter-term application covering capping of trenches 1-7, vaults 8 and 9, the construction of vaults 9a, 10 and 11 and any associated infrastructure works during the summer months.

"We believed this was the right decision for our business, the NDA and the broader nuclear industry at this current time."

Nuclear industry gets with the Programme

Diverting radioactive waste is a major component in the delivery of the UK Nuclear Low Level Waste Strategy.

But embedding long-term principles for waste management operations is also key to the Strategy, developed by the Nuclear Decommissioning Authority (NDA) on behalf of the UK Government and with the support of LLW Repository Ltd.

The company's National Programme Office works with all the players in the nuclear industry, including regulators, waste producers and the supply chain, to implement the Strategy.

Key to delivering the Strategy is the embedding of culture change across the industry, to support excellence in LLW management. This is the focus of the National Programme. Strategy delivery is achieved through a range of programme arrangements and initiatives, including the Peer Review and Peer Assist processes, two relatively new additions to its armoury.

"Peer Review is a benchmarking process," said Helen Cassidy, National Programme Implementation Manager. "For the first time, in the UK, we have developed a model which says, this is what excellence in Low Level Waste management looks like."

In Peer Reviews a small team of practitioners involved in LLW management will visit a site for three days to carry out an independent check of its performance against the Best Practice model.

Reviewers will look at a host of factors, from training to transport, processes to policies.

Supporting excellence: Hannah Kozich, left, and Helen Cassidy

Helen added: "The value is that prior to the independent check, the organisations have looked at their own practices against the model, where they are, and more importantly where they would like to be – working on the basis that we all want to improve.

"The beauty of the model is that it's flexible for different sized organisations at different points in their life cycle. While some may be excellent, others may have more immature arrangements. These might be appropriate for where they are in their programme lifecycle."

Hannah Kozich, Head of National Programme, continued: "It's interesting that the feedback from Peer Reviewers overwhelmingly says they found the experience really useful and they took ideas back to their own organisations. They get as much out of it as the sites they visit."

The Peer Review process was launched in 2013 and four NDA sites have benefitted.

"Some of the feedback we got said that, while the Peer Review process was valuable, it takes people away from their regular job for a week," Hannah said.

"They asked if we could develop an approach which allowed them to focus on one area where they had a problem. So we developed Peer Assist. It's a complimentary process focused on improvement, flexed to meet the needs of the customer.

"We discuss the scope of their problem, their objectives, and then we facilitate an event, inviting people from other Site Licence Companies to help out.

"We ran one on forecasting with Sellafield and asked Magnox to provide some expertise as they have quite mature arrangements for forecasting waste arisings. We did another on our low level waste management arrangements at LLWR and had someone from Sellafield help who had opened routes for Sellafield to access the treatment providers.

"This meant that LLWR could take the learnings from Sellafield and hopefully that allows us not to make the same mistakes or repeat things that didn't work so well."

A Peer Review is planned this year at the LLW Repository site near Drigg.

In 2008 the Repository site was a disposal facility, receiving low level radioactive waste at an unsustainable rate. Seven years later, with waste producers using alternate treatment and disposal routes offered by LLWR's frameworks, waste disposals at the Repository have reduced to a level that should enable them to continue well into the 22nd century. Peer Reviews and Assists, and training, will continue to play a major role in ensuring this is the case.

"Get in touch, if you are interested in working with us," appealed Hannah. "We would love to hear from you."

Giving us a run for our money

LLWR is to splash £5,000 on Cumbria's biggest Colour Run. The company will sponsor Hospice at Home West Cumbria's Colour Run and Family Fun Day on Sunday, 2nd August at Muncaster Castle. Last year's event was the county's first and proved a huge success, 750 entrants raising over £20,000 for the cause.

Cath Giel, LLWR's Head of Public Affairs, said: "LLWR has a long standing relationship with Hospice at Home West Cumbria, the charity regularly benefits from employee fundraising activities and was our nominated Charity of the Year in 2014. We are delighted to continue this relationship by becoming a major sponsor for the 2015 Colour Run and wish everyone participating the best of luck in their fundraising endeavours for this very worthy cause."

Teamwork pays big dividends for partners on site

The decommissioning of the PCM Decommissioning Project on the LLWR site is making excellent progress - due to terrific teamwork.

The project is being delivered by an integrated team of LLWR personnel and contract support led by NSG Environmental Ltd, one of the UK's leading decommissioning contractors.

The team has brought expertise together from five organisations who work with a single goal to decommission and demolish the PCM facilities and make land available for future site development projects.

"As you would expect from a decommissioning project of this scale we have had our challenges along the way but now have a highly motivated team working on four work faces and we are seeing real progress" said Andy Deall, NSG Director Site Operations North.

"But it's not just a collaboration with LLWR. We have support from Nuvia, PC Richardson and Hertel," added Andy.

The project is now 18 months into a 6-year programme and improvements and efficiencies are constantly sought to beat the baseline dates.

Andy added: "The key to this will be keeping the team motivated, listening to all parties for what works well and where we could improve.

Real Deall: Andy, left, with Supervisor Bernie Bain and Rob Hawley, Project Engineer

"There will be small marginal gains we can make but there will also be fundamental changes to our original plans that will give us the big savings - we must keep listening, challenging and improving to really make the project a success".

NSG gained a presence on the site in 2011 and after a comprehensive tendering exercise were awarded the contract for the PCM Decommissioning Project in 2013.

The project has achieved a number of key targets through 2014 and has worked hard to ensure that LLWR's milestones with their client, the Nuclear Decommissioning Authority, have been delivered. The big success within the year was the implementation of a void recovery methodology which involves the removal of a concrete floor slab, section by section, using a track mounted saw and then removing them from the work area to allow the void below to be decontaminated.

"Sounds easy?" said Andy. "The slabs have masses of up to 400kg and are removed by two operatives working in air-fed suits, the work is challenging and the team have optimised the process and are regularly removing 2 slabs per day. We have cleared two storage rooms to date which equates to around 50 slabs, only another 300 to go before we complete."

The focus for 2015 is to commence the decommissioning in Magazine 3 and to continue with the well-established activities in the other magazines.

"In addition we are working with our demolition partners KDC to commence the Magazine 4 demolition," Andy said.

"We are now making real progress and look forward to another productive and rewarding year."

Spotlight on Excellence This edition: Tony Buchanan, Programme Manager

Tony Buchanan's first experience of working at the Repository site came in July 2008 as the Vault 9 construction project got underway.

"It was a very challenging role, to see how we could bring all the construction materials into site and minimise disruption to Drigg village," said Tony, whose introduction to LLWR was as Transport & Logistics manager for Birse Civils Ltd after working on the Channel Tunnel Rail Link project.

"We managed to bring in 98% of materials by rail, which I'm proud of, and I know LLWR is, too."

Towards the end of the Vault 9 project Tony was promoted to Project Manager.

"We completed the last one-third of the concrete pours in four months, beating all sorts of production records we'd had on site previously," he added.

Tony, pictured right, then moved on to a Design and Build project at Sellafield for Balfour Beatty before being approached by LLWR and returning to the company as a project manager in February 2012.

He launched the Sediment Removal project in the Marine Holding Tanks, and his other projects included the installation of an extension to the office complex, Vault 8 Leachate Walkway and Trench Cap improvements.

In the past year he has secured his Association of Project Manager Practitioner qualification, for which he was sponsored by the company.

Six months ago he was asked to take over as Programme Manager for the multi-faceted Security Enhancement Programme on site, which he plans to see through to completion in December, 2018.

He said: "The company whilst maintaining its excellence in 'Business as Usual' activities is moving into a different area of expertise.

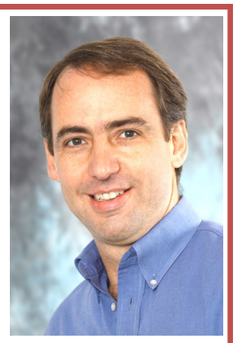
"We are great at Waste Management Services and disposing of low level waste.

"We are now moving in to a new phase over the next five years where we will increasingly look at excelling in the delivery of projects.

"Obviously that will change the way the business operates, and I have been heavily involved in aligning the business to ensure that we all strive to become the best delivery organisation in the NDA estate.

"Lots of challenges lie ahead to mould the company into being more schedule-focused."

View from the top



I have been impressed at the many diverse accomplishments that the LLWR continues to churn out. We are a small organisation and yet, everywhere I go, I receive positive comments about the LLWR workforce and its accomplishments.

It is impressive if you stop and think about it. We are demonstrating true safety leadership in the area of safety, and are well on our way to achieving 2 million man-hours without a lost time injury… that means that we have gone nearly 4 years without incurring a single serious injury!

And it isn't because we are sitting on our hands. The amount and complexity of work performed in that 4 year period is more than the site has ever done in that period of time. The Site also has earned the reputation for delivering to its commitments with excellence. Over this same period of time, LLWR employees have consistently executed their work and earned over 95% of their NDA targets.

This newsletter provides a pretty good snapshot of some of site's accomplishments and reflects the positive momentum that many of us see and feel here at the LLWR. Positive momentum is a very powerful force and we are fortunate to be in the position we are now in.

I can remember the first car that I drove (I was 16 and lived in Spain). It was an old Citroen with an incredibly small 2-cylinder engine. As a young teenager who liked to drive fast (some things haven't changed) I can remember my frustration in how long it took to get the car to 60mph; it did something like 0 to 60 in 20 seconds!

Oh, but once it got to 60 there was nothing stopping me (not even the brakes since, like the engine, they too were severely undersized). I found that once at this speed, I was on an equal playing field with the rest of the motorway and could easily pass much more powerful vehicles.

We are finally moving at a top (and safe) speed and have built up a momentum that will sustain us into the future.

Because of some recent funding pressures – whilst recognising we are operating within record levels of investment - we have had to slow down a little and like my old Citroen, the best way to slow down is not to hit the brake but to take the foot off the accelerator.

The challenge here is to slow down some of our projects without losing our positive momentum.

Dennis Thompson

Managing Director

No time to waste …

Sediment waste from the Marine Holding Tanks project has been consigned off site ahead of schedule.

The sediment waste, once removed from the tanks, was sampled and characterised as Low Activity Low Level Waste.

The Waste Services Contract was utilised and the Augean landfill identified as the preferred supplier.

The waste was packed into Pactec bags and transported on curtain sided vehicles. The waste was transported in two vehicles from Tyson H Burridge and buried on the day it arrived at a landfill amenity in Northamptonshire.

This was the first time that the LLWR site has consigned waste via this route. The acceleration of the schedule was only possible due to a host of teams rising to the challenge including LLW Operations, Packaging, Health Physics, Dangerous Goods Safety Advisors (DGSAs), POWs, Waste Acceptance, Commercial and Service Delivery.

"The disposal of waste off site was very successful," said Becky Ruddy, Waste Delivery Manager. "A readiness review was held with all key stakeholders, resulting in the loading and consigning of the waste going really well on the day.

"This is a great achievement to get a new route opened for VLLW from a National Waste Programme perspective, adhering to the principles of the waste hierarchy and avoiding using the precious capacity in the vault for waste which does not need to go there.

"Special thanks must go to the DGSAs, POW and LLW Operations team who provided fantastic support on the day of the consignment."

The Marine Holding Tanks provide a collection point for surface and groundwater (leachate) from the engineered vaults 8 and 9, magazine aprons and trenches 1 to 7, prior to sampling and discharge to the Irish Sea.

Due to Environment Agency and Site Licence requirements periodic inspections of the Marine Holding Tanks are carried out, which can't be done unless the tanks are empty.

Sediment to a depth of around 200 to 300mm was found in each of the two tanks. Steve Gregory led the project to remove this waste and allow Engineering to carry out a civil inspection of the tanks.

Teamwork: Members of the team that completed the removal off site of sediment from the Marine Holding Tanks

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LLW Repository Ltd

ON THE LEVEL

Edition 4 June 2015

NEWS AND VIEWS FROM THE **LLW REPOSITORY**

All change: above, the Retrieval Facility has gone and the entrance to Magazine 4 is visible., and below, as it previously looked with the old MRF in the foreground .

Magazine's new look

A major skyline change is underway at the LLWR site.

Magazine 4's Retrieval Facility (MRF), a fixture at the Repository since the 1990s, has been demolished without incident, setting the template for the future demolition of such facilities on site.

MRFs were constructed as purpose-built engineered facilities to allow the retrieval of Plutonium Contaminated Materials (PCM) from magazines before decommissioning and demolition could begin.

Carl Smith, PCM Senior Project Manager, said: "This is the first of five remaining Magazines Retrieval Facilities to be demolished and we have proven the demolition method for the MRF.

"This will be reviewed as part of the post-project review to identify any improvements and efficiencies for the future demolition phases."

All remaining magazines on site will be demolished, in time, to make way for future vaults. The soft strip, de-planting and removal of the cladding and portal frame is now complete for Magazine 4.

All the demolition work - executed by contractor KDC under the decommissioning and demolition framework with NSG - has been recorded by four time-lapse cameras strategically located around the demolition site.

Superintending Officer Site Support Mike Jewell, LLWR Nominated Representative, said he was impressed with the quality of KDC's work and attitude to the job.

Carl Smith was also complimentary on scope completed to date, KDC's level of professionalism and demonstration of the behaviours expected on the LLWR site.

"Mike Jewell and KDC have developed an excellent working relationship, which has contributed to the excellent progress made," he said. The magazines were constructed to store munitions during World War Two, when the site hosted a Royal Ordnance Factory.

PCM was later stored in some of these concrete bunkers and in the 90s, retrieval facilities were built to facilitate the removal, packaging and transport of the waste for safe storage in modern, purpose-built facilities at Sellafield.

We sign up for Twitter

LLWR is joining the social media revolution.

The company launched a Twitter account ahead of its Customer Forum in April and regular tweets updated followers as the day progressed.

It is now tweeting regularly, to keep interested stakeholders updated on company and industry developments.

The organisation has had a shell account with Linkedin for some time, which is now being populated.

All stakeholders are invited to follow LLWR on Twitter @llwrsite.

Get in touch with us on Twitter about items of interest you would like to see us highlight. Contact Communications Officer Martin Morgan at Martin.J.Morgan @llwrsite.com or phone 019467 70225.

Above: Cath Giel, Head of Public Affairs, leads a tour of Pelham House, and top left, Rebecca Watkins and daughter Jessica point the way to fight fiires. Left, a police dog gets its teeth into its work, and below, it's all smiles after a bus tour of site

Warm welcome to our guests

The decision to hold a second Open Day little over six months after our last one paid off for LLWR. Over 130 visitors turned out in warm weather to learn more about the company, and tours of the Repository site and Pelham House again proved popular.

Cumbria Fire Service turned out and a display from the Civil Nuclear Constabulary's dog section and armoury enthralled young and old alike. Another Open Day is planned for spring next year.

Seascale Scouts are containing their joy

Around 90 kids have benefitted after LLWR gifted two ISO containers to the 2nd Seascale Scouts.

The group, which also includes Beavers, Cubs and Explorers, aged from six to adult, girls and boys, needed to find a new home for stacks of equipment as the Church Hall where it was stored is being sold. And LLWR popped up with the solution, even ensuring the former shipping containers were painted green, in keeping with scout colours.

"Storage has always been a big issue for us as we have so much kit. These containers are fantastic, we would have been struggling without them." said Neil Henderson, Scout Leader.

"The Sports Hall in Seascale and the local school are both options for our future accommodation, but neither has storage space. "If we didn't have the containers I don't see how we could manage."

The containers were transported from Merseyside by Tyson H Burridge, of Distington, and sited free of charge by the business on Seascale Parish Council land close to the Sports Centre.

As it was such a good cause they were re-painted, stored and loaded free of charge by Bootle Containers Ltd, a Liverpool-based company that supplies a range of equipment to LLWR.

The Seascale group is thriving, with youngsters also flocking from Ravenglass, Drigg, Santon Bridge, Eskdale and Waberthwaite to get involved.

"We have waiting lists in two of our sections," Neil added.

"We have probably the biggest group in the district, and among the biggest in the county."

Smiles better: The Seascale group takes delivery of its new containers

A forum for greater understanding

More than 300 invited guests turned up at LLWR's 8th Customer Forum at Rheged.

The day looked at developments within the company, which last year focused on consolidating, enhancing and expanding services that had been introduced previously.

Featured topics included waste segregation and treatment, characterisation, transport, logistics, packaging, treatment and disposal services.

Head of Waste Management Services Martin Walkingshaw made the opening and closing remarks, while presentations were also made by LLWR service providers .

Martin said: "Our Customer Forum and the Supply Chain Exhibition that runs alongside it are one of the highlights of my year.

"It gives us an opportunity to showcase the work our customers and suppliers are delivering across the UK – many of their projects are using our company's services.

"We are able to provide updates on the work we are carrying out on the LLWR site and the massive effort that is going in to maintain and develop our capabilities."

Full house, above, at Rheged, while right. Amy Huntington, Environmental Safety Case Technical Specialist with LLWR, takes centre stage, and below, LLWR's Framework partner Graham Construction sets out its stall.

New fence complete next summer

Work on our robust new security fence around the Repository site, the first part of our Security Enhancement programme, is well underway. Two of the nine sections have been completed, meaning 1.1km of the 4.5km perimeter barrier is now in place, and work on a third will utilise the same construction techniques.

Sturdy: A section of LLWR's new security fence

The weldmesh steel fence, topped with a robust razor barb, is green in colour to best fit in with the surroundings.

Work to replace the existing chain link fence mesh at the southern end of site is due to start this month and take 12 weeks to complete.

LLWR's Framework partner Graham Construction is to carry out all works on the fence in the remaining sectors. A patrol track adjacent to the new fence will be laid in those areas where one does not currently exist.

"All works are due for completion in the summer of 2016, so there's a busy year ahead," said Paul Brown, Project Manager.

EA Consultation

The Environment Agency has released its consultation on the LLWR Permit Variation Application. It will be hosted on its consultation portal. It will run until 23 July.

https://consult.environment-agency.gov.uk/portal/npsapp/llwr/dd

https://www.gov.uk/government/collections/low-level-waste-repository

The EA's review of LLWR's Environmental Safety Case will be available shortly on its publication catalogue at:

https://www.gov.uk/government/publications?departments%5B%5D=environment-agency

Annex B: Consultation Schedule

Stakeholder Engagement

Support for Planning Application; July 2011 – Present

PLANNING COMMUNICATIONS

2015-16	A	M	J	J	A	S	O	N	D	J	F	M
PLANNING APPLICATION MEETINGS WITH CCC (2015)	1	20	29			23	15	*	*	*	2	11
PLANNING APPLICATION MEETINGS WITH CCC (2014)	8 14 29	16	13 20	21	6 14 27	17	7 23		1	27	11	19
SUPPORT LETTER – LLWR MANAGING DIRECTOR (2014)			4									

*DATES TO BE CONFIRMED

PLANNING VISITS TO LLWR

2011-2015	A	M	J	J	A	S	O	N	D	J	F	M
COPELAND PLANNING MEMBER							5					
COPELAND MAYOR (2015)						29						
CCC ECOLOGY VISIT (2015)	13											
NuLEAF BOARD MEMBERS (2015)				22								
DRIGG & CARLETON PC MEMBERS (2015)				27								
CCC ENVIRONMENT TEAM (2014)				31								
DC&R COMMITTEE (2014)		7										
CCC PLANNING BOARD MEMBERS (2014)											12	
CCC EXECUTIVE MEMBERS (2014)										15		
CCC PLANNERS & WYG MEMBERS (2014)								19		23		
WCSSG STAKEHOLDER MEMBERS (2013)					29							

STAKEHOLDER OPEN DAYS

2011-2015	A	M	J	J	A	S	O	N	D	J	F	M
COMMUNITY OPEN DAY – PELHAM/SITE (2015)	18											
PLANNING APPLICATION CONSULTATION – DRIGG VILLAGE HALL (2015)						17						
CUSTOMER FORUM – RHEGED (2015)	29											
COMMUNITY OPEN DAY – PELHAM/SITE (2014)							4					
EMPLOYEE FORUM – 2 DAYS AT ENERGUS (2014)		16 & 19										
CUSTOMER FORUM – ENERGUS (2014)		21										
EA/LLWR PERMIT APPLICATION OPEN DAY (2014)			18									
CUSTOMER FORUM – RHEGED (2013)		1										
LLWR/EA PLANNING APPLICATION CONSULTATION – DRIGG VILLAGE HALL (2013)									12			
COMMUNITY OPEN DAY – PELHAM/SITE (2012)			23									
EMPLOYEE FORUM – 1 DAY PELHAM MARQUEE (2012)			25									
ESC OPEN DAY – DRIGG VILLAGE HALL (2012)						20						
CUSTOMER FORUM – RHEGED (2012)	26											
LLWR SITE OPTIMISATION & CLOSURE WORKS – DRIGG VILLAGE HALL (2011)												16
CUSTOMER FORUM – RHEGED (2011)		12										

EA REGULATORY MEETINGS

2015-16	A	M	J	J	A	S	O	N	D	J	F	M
Environmental Safety Case Regulatory Meetings	NA	20	18	22	11	25	14	18	16	*	*	*
2014-15												
Environmental Safety Case Regulatory Meetings	11	-	25	16	13	22	20	12	9	12	16	9
2013-14												
Environmental Safety Case Regulatory Meetings	17	15	12	17	12	18	16	13	11	*	*	*
2012-13												
Environmental Safety Case Regulatory Meetings	18	25	20	31	-	13	23	14	12	16	18	20
2011-12												
Environmental Safety Case Regulatory Meetings	13	*	*	*	*	*	26	-	15	19	22	-

ESC DELIVERED MAY 2011 NO MEETINGS FOR 5 MONTHS

LIAISON MEETINGS WITH D&C PC

2015-16	A	M	J	J	A	S	O	N	D	J	F	M
D&CPC Liaison Group	13	27	24	29	NA	23	28	25	NA	27	24	29
2014-15												
D&CPC Liaison Group	23	NA	4	10	20	24	22	27	18	29	26	26
2013-14												
D&CPC Liaison Group	17	NA	5 27	30	NA	24	23	27	17	28	25	25
2012-13												
D&CPC Liaison Group	24	NA	20	NA	16	NA	3	28	NA	29	28	NA
2011-12												
D&CPC Liaison Group	NA	31	28	26	NA	27	NA	7	8	30	NA	7

WCSSG LLWR WORKING GROUP

2015-16	A	M	J	J	A	S	O	N	D	J	F	M
WCSSG LLWR Working Group	NA			22			21			20		
2014-15												
WCSSG LLWR Working Group		15		24			22			28		
2013-14												
WCSSG LLWR Working Group	25			18			23			*		
2012-13												
WCSSG LLWR Working Group	18			20			25			31		
2011-12												
WCSSG LLWR Working Group			8			14			14			
2010-2011												
WCSSG LLWR Working Group			9					8				9

PLANNING PRESENTATIONS DELIVERED

NEWSLETTERS

2011-2015	A	M	J	J	A	S	O	N	D	J	F	M
External Newsletter - On The Level 2015			X									x
External Newsletter - On The Level 2011	X				X							

SEE ATTACHED COPIES

Annex C: Exhibition Boards

Introduction

LLW Repository Ltd

LLW Repository Ltd is a waste management company that provides services to customers to treat and dispose of low level radioactive waste. The company manages and operates the Low Level Waste Repository (LLWR) in West Cumbria on behalf of the Nuclear Decommissioning Authority and oversees the national low level waste (LLW) programme to ensure that low activity waste is managed safely and effectively.

Safe, secure and effective management of radioactive waste is LLW Repository Ltd's core business. Its customers include nuclear industry decommissioning and power generation activities, Ministry of Defence sites, the healthcare sector, research establishments and the oil and gas industries throughout the UK.

The company offers a range of waste treatment and disposal services, providing advice to customers and helping them manage their lower activity waste safely and efficiently, to reduce disposal volumes and costs, and preserve capacity at the LLWR in accordance with the waste hierarchy.

In addition to the treatment and disposal of LLW, a range of waste characterisation, segregation, packaging and transport services has also been developed to enable customers to maximise disposal efficiencies. Categories include Metallic Waste, Combustible Waste, Super Compactable Waste and Very Low Level Waste.

LLW Repository Ltd's dedicated team draws on more than five decades of experience to ensure that activities are managed safely and efficiently. It ensures that the low level radioactive waste generated in the UK is safely disposed of in a way that protects people and the environment to meet regulatory and stakeholder commitments.

The Low Level Waste Repository

The Low Level Waste Repository is the UK's national facility for the disposal of low level waste. It is located on the West Cumbrian coastline close to the village of Drigg and is one of 17 sites owned by the Nuclear Decommissioning Authority. The site is licensed to LLW Repository Ltd and managed and operated by its consortium parent body UK Nuclear Waste Management Ltd. The site has been operated by LLW Repository Ltd since July 2007.

Established in 1959 on the site of a former Second World War munitions factory, the Repository has safely operated as the nation's low level waste disposal facility for over 50 years. The waste is disposed of in engineered concrete vaults and where possible the waste is treated, containerised and grouted before placement in the vault. More than £100 million has been invested in the infrastructure of the Repository over the past decade to maintain the facility as a long term solution for the UK's low level waste.

Waste typically comprises paper, cardboard, plastic, protective clothing, soil, rubble and metal. Compacted waste is containerised for transport to the site by rail or road for disposal in engineered concrete vaults.

Site operations demand the highest standards of safety and environmental performance. In 2015 the LLWR site achieved the milestone of four years without a lost time accident. This equates to around two million working hours. The Environmental Safety Case will ensure that the site is environmentally safe both now and for future generations.

Packaging (P)

Metalic Waste (M)

Combustable Waste (C)

Super Compactable Waste (S)

Very Low Level Waste (V)

Low Level Waste (L)

Alternative Treatment (A)

Expert Support (E)

Transport (T)

Waste Characterisation (W)

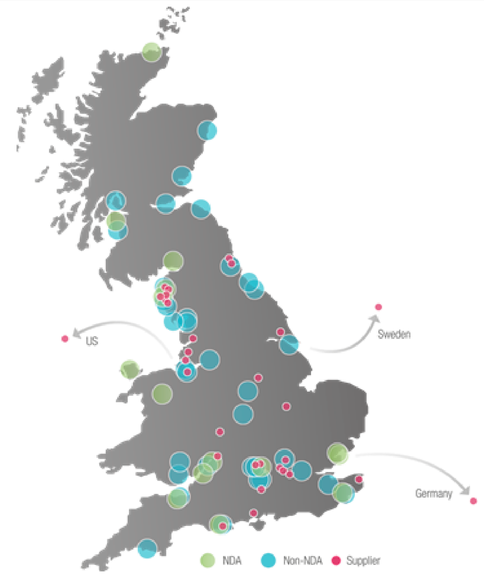
Waste Diversion

Plan layout of the LLWR Site

1) Site Entrance
2) Conference Centre
3) Wildlife habitat
4) Rail sidings
5) Office complex
6) Grouting Facility
7) Trenches 1-7
8) Vault 8
9) Vault 9

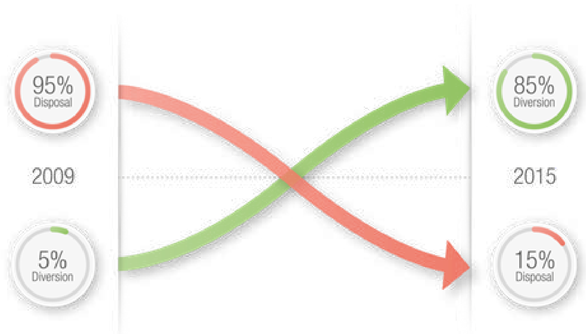
Establishing an International Network

LLWR services over 50 customer sites across the UK, offering access to an international supply network. Since 2009, LLWR has facilitated 400 different customer, service and supplier combinations.

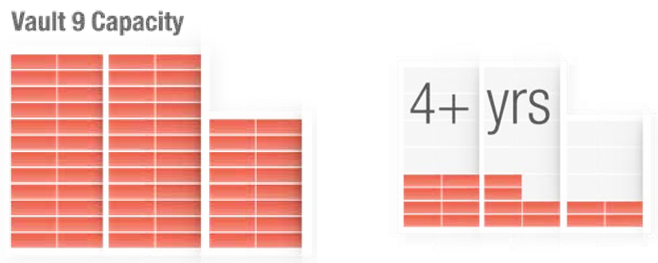


Disposal to Diversion

LLWR has delivered a significant redirection of waste flows across the NDA estate and the wider nuclear industry. In 2009 over 95% of LLW generated was disposed of at the Low Level Waste Repository. Today over 85% of waste generated is diverted away from disposal at the repository site using a range of treatment and alternative disposal routes, managed by LLWR.



Vault 9 Capacity



Pre Strategy

Without diversion Vault 9 would have been full in early 2015

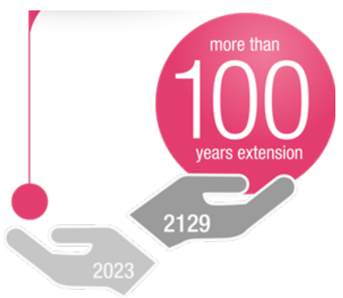
Post Strategy

LLWR has secured a 4 year life extension for Vault 9 and it is only 1/3 full.

Without the diversion rates achieved by LLWR over the last five years, Vault 9 would be full. Instead, with our current strategy Vault 9 is still available for waste disposal.

Preserving a National Asset

As a result of the redirected waste flows and our collaborative work with waste generators to improve the UK's radioactive waste inventory, LLWR is on course to ensure a 100 year extension to the operational life of the UK's national Low Level Waste Repository (subject to the necessary planning permissions being obtained). Preserving this strategic asset provides the UK nuclear industry with an essential route to manage radioactive wastes that require specialist disposal.



Site Optimisation and Closure Works

The Environmental Safety Case

03

Purpose

Under the terms of the Environmental Permit granted by the Environment Agency, LLW Repository Ltd were required to submit an Environmental Safety Case (ESC) by the 1st May 2011. The 2011 ESC:

- Presented the arguments and evidence concerning the environmental safety of disposals of solid radioactive waste at the LLWR; and
- Provided a basis for the environmentally safe management and regulation of the site.

The ESC is now being implemented as a live safety case for the future management of the LLWR and a baseline for assessing future changes in plans.

Process

Work undertaken has included:

- Improving the understanding of the historic waste already disposed.
- Reviewing engineering designs to support the closure of the repository.
- Collecting more geological data and using it to investigate groundwater movement and to calculate the movement of any waste material
- Developing models to calculate any transfer of radioactive material to the environment
- Improving our understanding of potential chemotoxic effects and developing an approach to controlling the disposal of non-radiological materials

Coastal Erosion and Climate Change

Available evidence suggests the site will be eroded on a timescale of a few hundred to a few thousand years, with consequent disruption of the repository.

While this situation is unusual all near-surface disposal facilities are vulnerable to long-term disruption by natural erosion processes and/or human actions. This is taken into account by setting limits on the waste that may be disposed.

The EA has given a formal view that providing certain requirements are met, the potential for disruption of the site by coastal erosion is an acceptable risk.

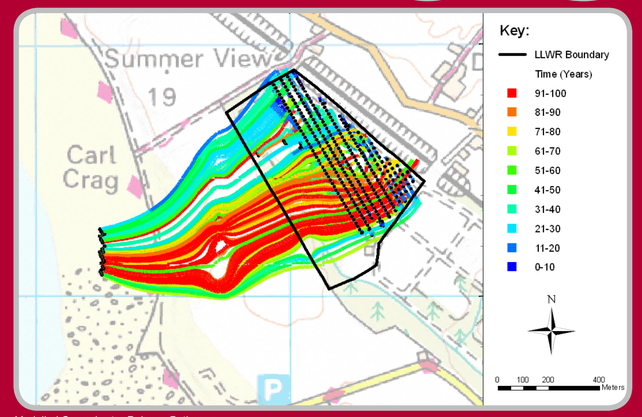
Radiological Capacity

The 2011 ESC has demonstrated that the LLWR can accommodate all LLW in the UK radioactive waste inventory (subject to assumptions about waste management and acceptance).

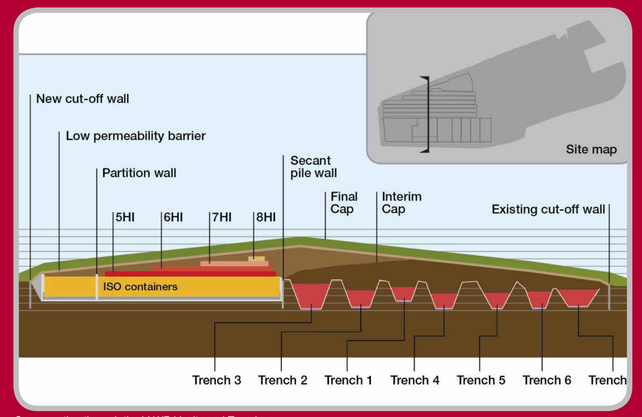
Trench Inventory

LLW Repository Ltd has taken a pragmatic approach to deriving the trench inventory, reflecting the quality of the data available and the actual or potential significance of individual radionuclides.

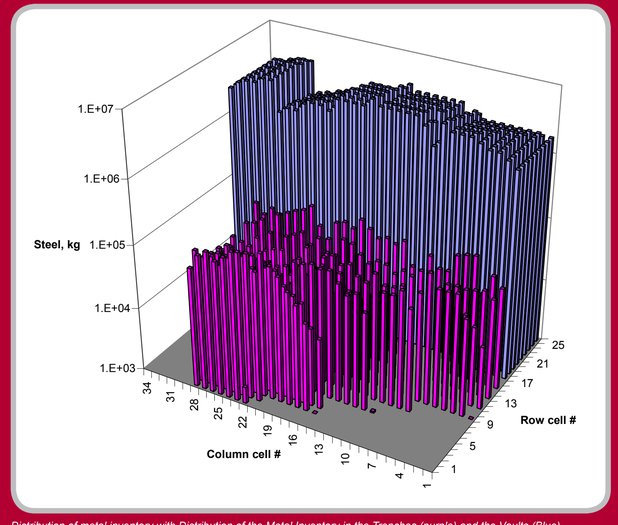
Research was undertaken, involving interviews with former staff including the assessment/analysis of those interviews. This process did not identify any significant or quantifiable impact on the inventory. No changes to the inventory of disposals to the LLWR trenches have been recommended as an outcome.



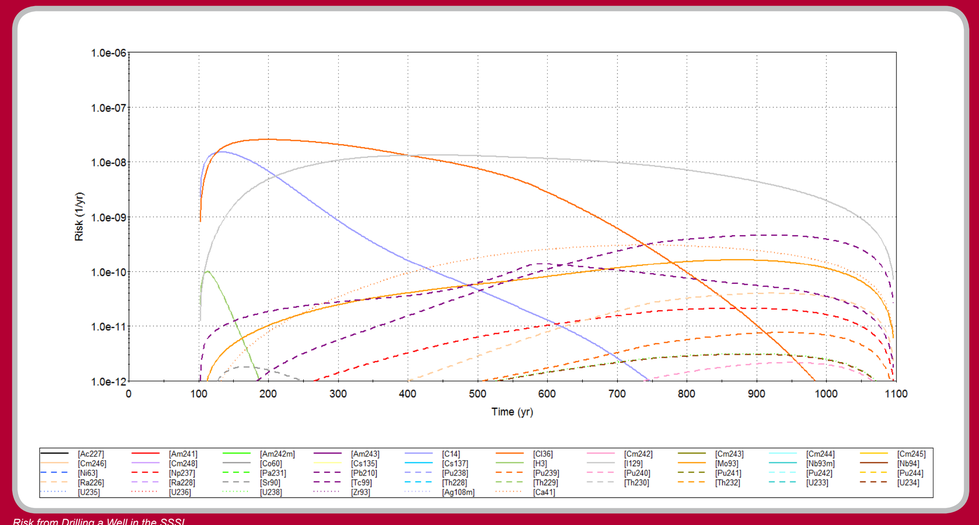
Modelled Groundwater Release Pathways



Cross-section through the LLWR Vaults and Trenches



Distribution of metal inventory with Distribution of the Metal Inventory in the Trenches (purple) and the Vaults (Blue)



Risk from Drilling a Well in the SSSI

LLW Repository Ltd

Policy Overview

There are a number of documents which set out the policy framework for how low level radioactive waste (LLW) should be managed within the UK and Cumbria.

At a national level, the Long Term Management of Solid Low Level Radioactive Waste in the UK was published in March 2007 and provides a high-level national framework for LLW management decisions to be taken.

A further Strategy - The UK Strategy for the Management of Solid Low Level Radioactive Waste from the Nuclear Industry - has been developed as a requirement of this policy and informed by a range of background studies and a robust evidence base.

The Strategy confirms that the LLWR is a key asset to the UK; its continued availability is vital to LLW producers and central to the implementation and effectiveness of the Strategy. The Strategy aim is therefore to extend the life of the LLWR to ensure continued disposal capacity for the long term, subject to the verification of the Environmental Safety Case for the safe continued operation and future closure of the facility.

The NDA is also reviewing its 2006 Strategy and the replacement Strategy is also expected to emphasise the long-term importance and function of the LLWR and the need to make optimum use of its remaining planned disposal capacity.

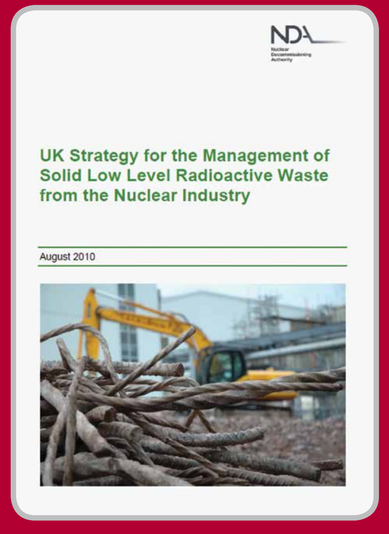
At a local level, the Cumbria Minerals and Waste Development Framework (MWDF) provides further policy support for the full extent of the proposed site optimisation and closure works, thereby enabling implementation of the UK Strategy aims and objectives.

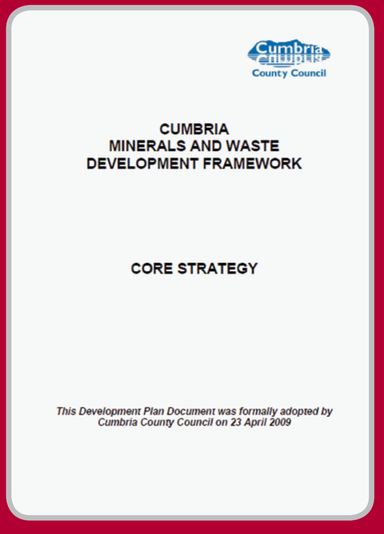
The MWDF Core Strategy requires that in order for the LLWR to continue fulfilling its role as a component of the UK's LLW management capability, proposals for very long term storage or disposal must demonstrate feasibility in respect of the long term integrity of the site in terms of sea level rise and coastal erosion, and within the radiological capacity of the site. The expected verification of the ESC will fully address these points.

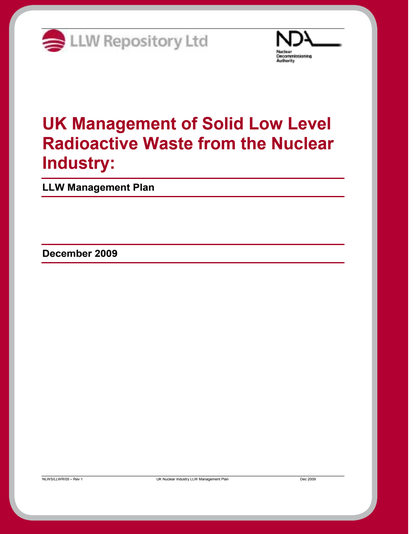
Summary and Key Points

The policy framework:

- Provides clear objectives and carries full material weight for planning decision-making purposes.
- Makes clear the national role and status of the LLWR as a specialist UK facility that can accept a wide range of LLW from various producers.
- Identifies the LLWR as central to implementation of the LLW Strategy.
- Provides in-principle support for the proposed deployment of the remaining planned disposal capacity at the LLWR, and its related closure and restoration of the site.







Site Optimisation and Closure Works

The Proposals

05a

The proposed development consists of a number of elements which will form part of a single application for planning permission. These works are fully consistent with those required by the Environmental Safety Case and comprise:

The Permanent Retention of Vault 9 for the Disposal of Waste

Planning permission is to be sought for the permanent retention of the vault and the disposal of waste within it.

1. Higher Stacking in Vault 8

The permanent higher stacking of containers within Vault 8 is proposed. The configuration of stacked containers will form part of the profile of the cap, thereby minimising the amount of profiling material needed. This practice is proposed for all future vaults.

2. Formation of Vaults 9a-11 for the Disposal of Waste

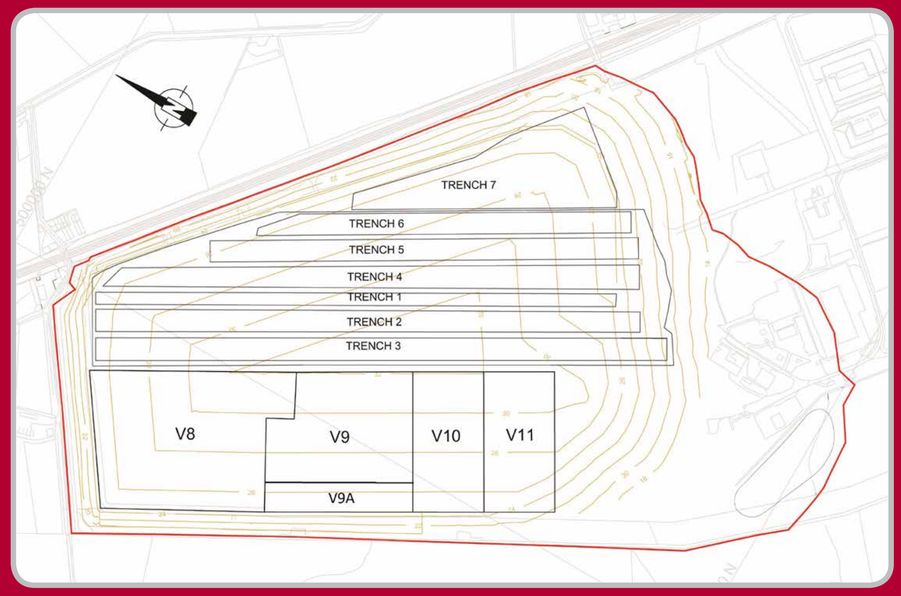
This element of the proposed development consists of the phased construction of three new vaults, Vaults 9a – 11 with an identical construction to that of Vault 9.

3. Phased Capping of the Trenches and Vaults

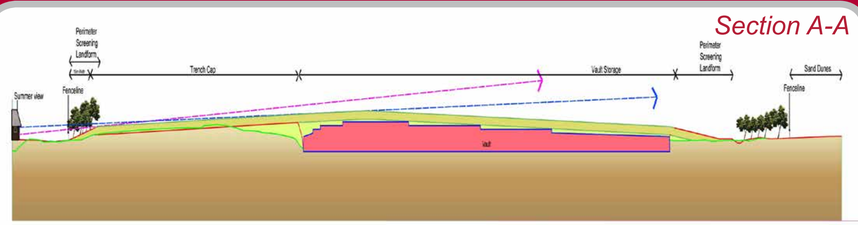
The proposed cap will provide a suitable long term landscaped landform and a physical cover over and protection to the trenches, existing and proposed vaults.

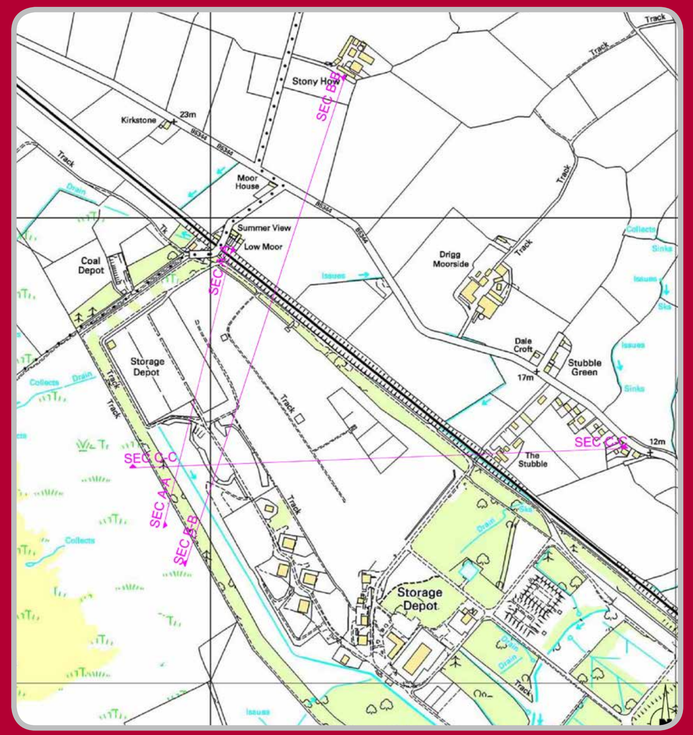
The cap is comprised of 12 component layers and is consistent with international best practice for LLW repositories and hazardous waste sites.

The final cap will be installed in phases across each vault and adjacent area of trenches.

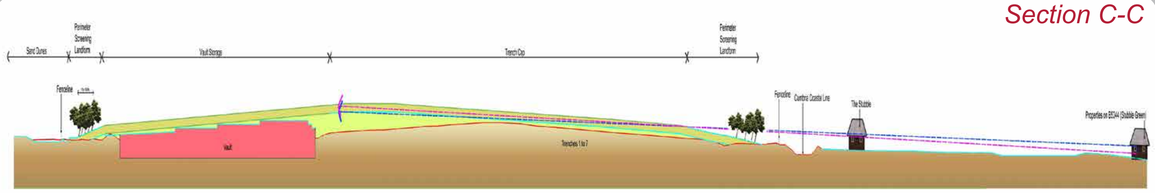


Section A-A

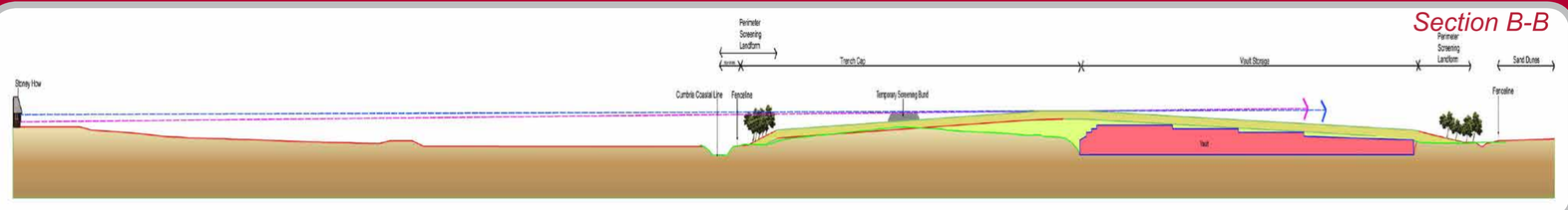




Section C-C



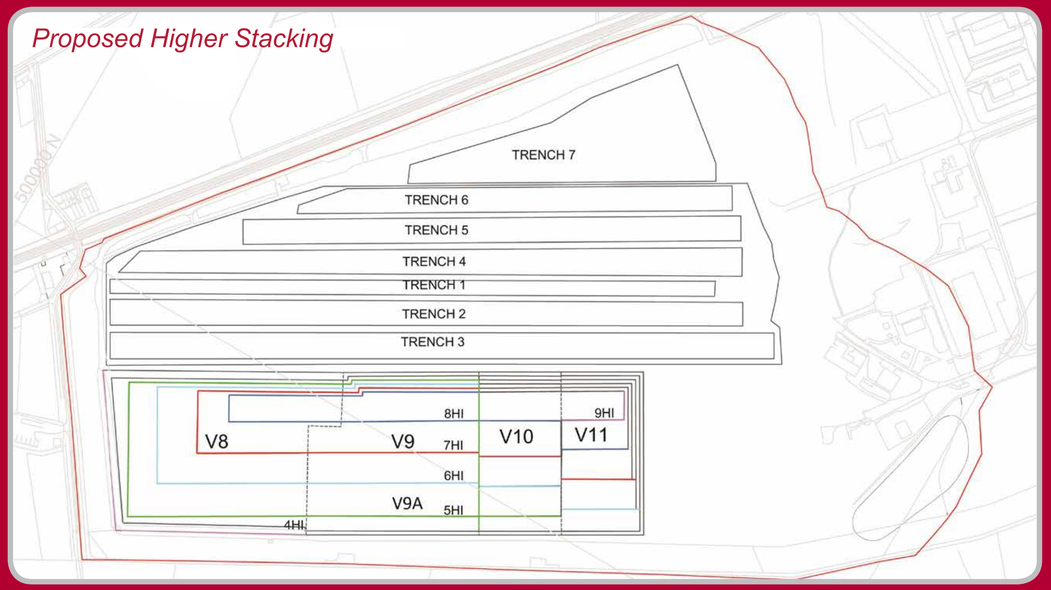
Section B-B

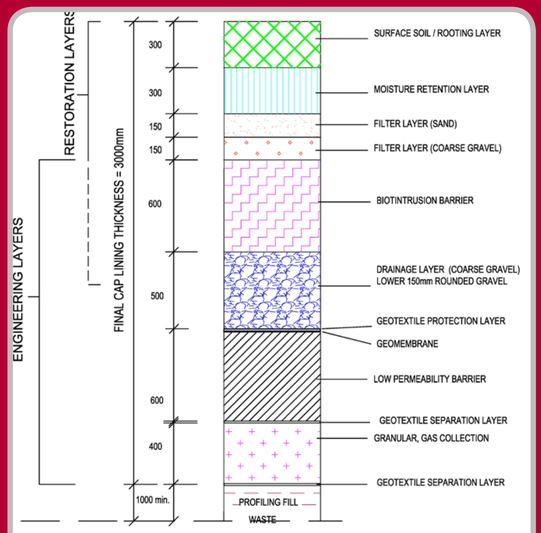


LLW Repository Ltd

The Proposals

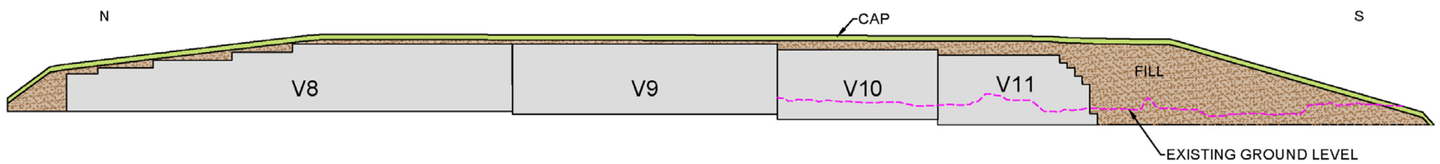
Proposed Higher Stacking

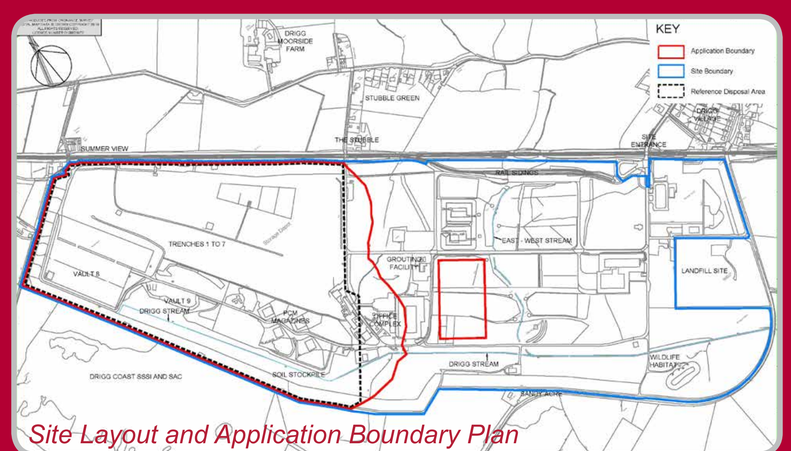




Section through Final Cap

North-South Section





Site Layout and Application Boundary Plan

Installation of a Cut-Off Wall and Secant Pile Wall

The cut-off wall will provide a low permeability vertical barrier around the facility with the primary function of preventing the lateral infiltration of water into waste in the trenches and vaults.

The existing secant pile wall will be continued southwards to provide support to the adjacent trenches through the construction and operation of the vaults and capping of the trenches.

Ancillary Works and Temporary Site Features

Drigg Stream Diversion

The existing Drigg Stream is to be relocated to the perimeter of the consented area and designed to drain the East-West Stream as at present.

Formation of Material Stockpiles

A large proportion of the construction material for each phase is to be brought in and stockpiled in designated on-site stockpiling areas prior to commencement in order to facilitate the efficient construction of the vault and landscape cap and minimise environmental impact.

Construction Compound

A construction compound comprising contractor's cabins, welfare facilities, materials and equipment storage areas, plant maintenance and batching plants will be formed during the construction phases.

Construction Phasing

Phase 1 (2016 - 2020) – Site preparation

This phase involves enabling operations and site works necessary prior to the main construction phases. The works include the removal of boundary planting towards the eastern boundary followed by the formation of the cap 'shoulders' and formation of the first phase of capping, combined with additional and early planting this will provide visual and acoustic screening for later phases.

Other works within this phase include:

- The diversion of the Drigg Stream;
- The installation of the secant pile wall; and
- The installation of the cut-off wall to the north and west of Vault 8.

Phase 2 (2019 - 2023) – Capping of Vault 8 and adjacent Trenches, construct Vaults 9A and 10

Major works within this phase include:

- importation of further capping and profile fill material
- the demolition of the remaining magazine buildings
- excavation and construction of Vaults 9A and 10.

Completion of the first phase of the final cap over Vault 8 and the northern part of the trenches then follows.

Phase 3 (2023 - 2030) – Capping of Vault 9 and adjacent Trenches, construct Vault 11

Work within this phase follows the pattern of construction works in Phase 2 with construction of a cut-off wall adjacent to Vault 9A and construction of Vault 11. Capping of Vault 9 and the area of trenches to the east follows. Import of profiling fill over the remainder of the trenches.

Phase 4 (2030 - 2032) – Capping of Vault 10 and adjacent Trenches

Work within this phase follows the pattern of construction works in Phase 3 with construction of a cut-off wall adjacent to Vault 10. Capping of Vault 10 and the area of trenches to the east follows.

Phase 5 (2045 - 2051) – Capping of Vault 11 and close Site

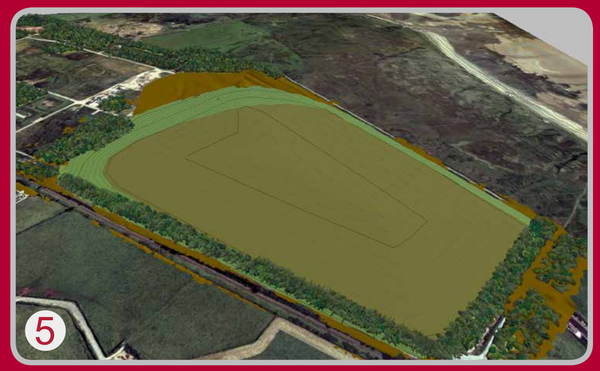
Work is limited to the importation of capping and profiling materials and the capping of Vault 11 and the remaining part of the trenches. Construction of the remainder of the cut-off wall to the south of the site. Importation of profiling fill and capping materials to complete the final landform.

Phase 1 (2016 - 2018) – Site preparation

Phase 2 (2020 - 2022) – Capping of Vault 8 and adjacent Trenches, construct Vaults 9A and 10

Phase 3 (2032 - 2034) – Capping of Vault 9 and adjacent Trenches, construct Vault 11

Phase 4 (2040 - 2041) – Capping of Vault 10 and adjacent Trenches

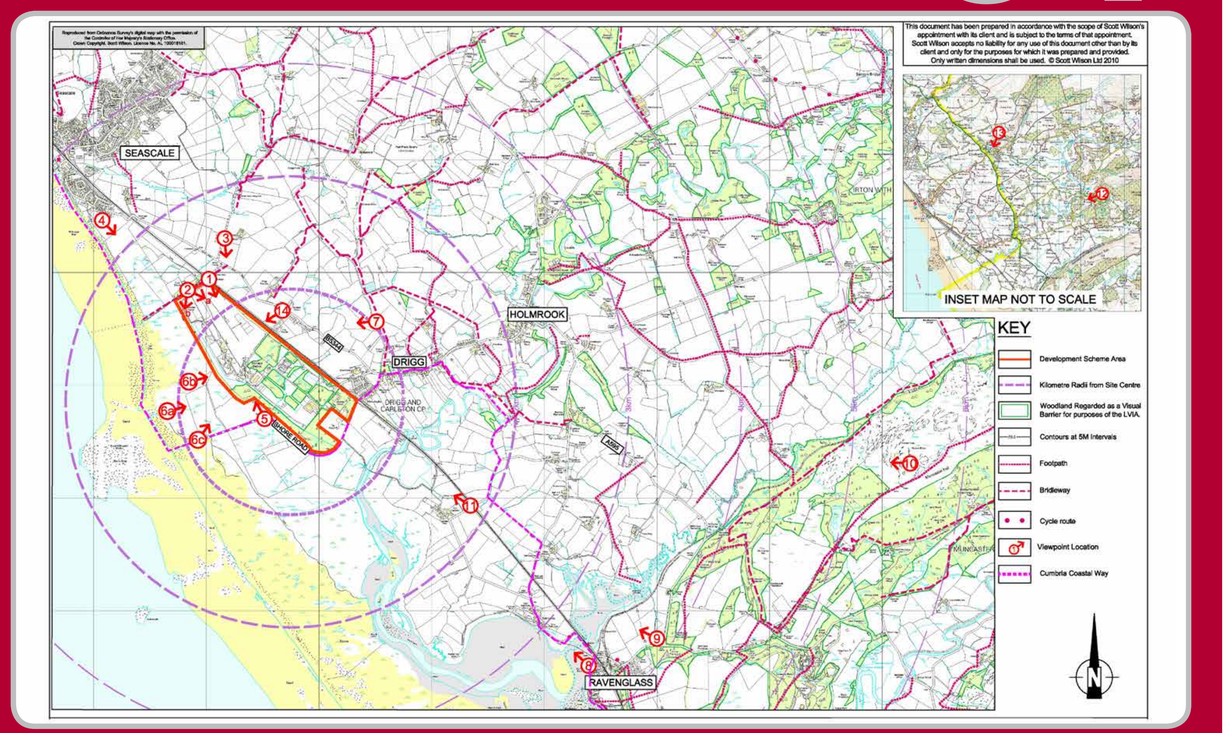


Phase 5 (2050 - 2055) – Capping of Vault 11 and close Site

Landscape and Visual

View from Summer View

View from bridleway to north of the site



View from the lane near Stony How

View from Rueberry Drive, Seascale

View from Sandy Acre

View from Drigg Coast SSSI

Ecology

Surveys of the Low Level Waste Repository (LLWR) have shown that it incorporates a range of different environments, some of which support habitats whilst others, such as the operational areas and within the vaults, do not. These habitats support a range of protected animal and plant species.

Where necessary, appropriate licenses will be obtained prior to works taking place.

Impacts

The ecological assessment has identified impacts on on-site habitats supporting the following species:

- Pennyroyal on the southern edge of the trench cap.
- Great crested newts in breeding ponds and associated habitats within and around the development area, although no breeding ponds will be affected.
- Reptiles in grassland on the trench cap and in stockpile areas.
- Breeding birds nesting in plantation woodland and on grassland on the trench cap.
- Natterjack toads breeding in ponds in the SAC/ SSSI dunes next to the site and using habitats within and around the development area.
- Bats foraging around the woodland areas on-site.
- Badger setts on the bank of Drigg Stream.

Habitats in the Drigg Coast SAC/SSSI, Cumbria Coast MCZ and other sites close to the LLWR site will not be adversely affected, either directly or indirectly.

Due to the long periods of time between each phase of the works, further ecology surveys will be undertaken prior to each phase, and the findings reviewed to ensure that any changes to the ecological value of the site are identified.

Mitigation and Enhancements

Key mitigation measures that have been included are broadly:

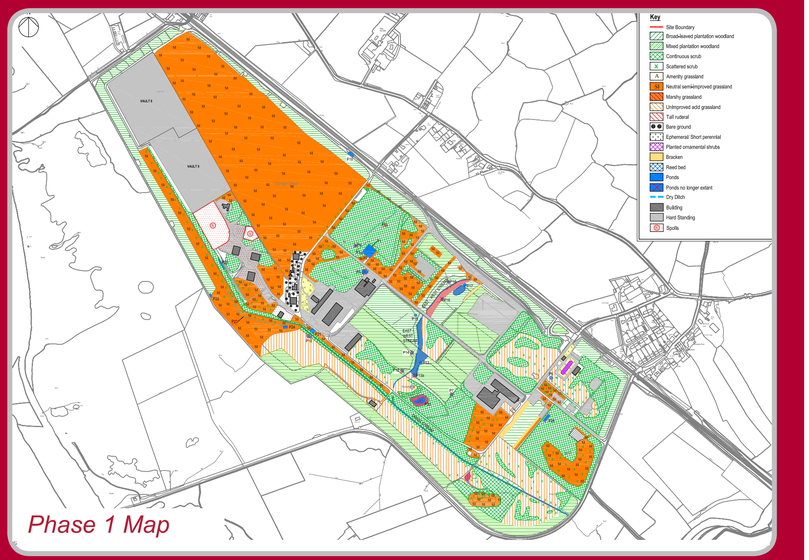
- Those that avoid the adverse impact.
- Where this is not possible, methods and designs to minimise/ reduce/ameliorate the magnitude of impact have been considered.
- Biodiversity enhancement through habitat restoration (ensuring net long-term benefits in terms for habitat quality and biodiversity potential).

The restoration proposals, in particular the habitat reinstatement on the final trench and vault cap will secure a favourable nature conservation end-use and that will create permanent open grassland habitats of at least comparable nature conservation value to those existing.

In addition, biodiversity enhancement will be integrated into the restoration proposals to ensure a net gain, specifically:

- Translocation of the colony of pennyroyal to a suitable location away from disturbed areas.
- Great crested newts and natterjack toads will be moved from affected areas to suitable locations away from construction areas and habitat enhancement measures will ensure optimal habitats.
- Reptiles will be translocated to a suitable area within the Repository which will be managed specifically for the benefit of reptiles. Artificial hibernacula will also be created in this area to provide overwintering habitat for reptiles.
- Breeding birds will be protected by not removing vegetation within the breeding season (approximately March to September). A range of different types of bird boxes will be erected on suitable mature trees within the LLWR site to maximise the diversity of the species attracted. Grassland associated with the final cap will ultimately result in an increase of approximately 28 ha of habitat suitable for ground nesting species such as skylark and meadow pipit.
- Affected badger setts will be closed under licence from Natural England if necessary.
- Other opportunities for enhancement of on-site habitats for barn owl, bats, badger, otter and terrestrial and aquatic invertebrates have been assessed.

Restoration Masterplan



Phase 1 Map

Summary

In general the approach to biodiversity comprises:

- Management of existing habitats during construction and operational phase.
- Protected species mitigation and habitat compensation under a relevant protected species licence from Natural England, where necessary e.g. great crested newts, badgers.
- Significant on-site habitat enhancement and restoration as part of the site closure works.
- Continued long-term management of the habitats within the LLWR for protected and notable species.

Construction Management

Access and Traffic

The existing sidings and rail reception facilities will be used as far as possible to maximise the volume of construction materials delivered by rail, as achieved through the construction of Vault 9.

The only construction materials to be brought in by road will be bentonite and concrete powders. Small scale imports of equipment or access for plant maintenance etc. will also be by road.

HGV movements within the site will use the existing site road network. Access to the cap will include a haul road to the east of the area for future vault construction and located beyond the crest of the interim trench cap landform to minimise the visibility of HGV movements onto the cap.

Construction workers will use the site access but will be encouraged to travel to/from site in mini-buses or shared cars. As with Vault 9 construction, a park-and-ride minibus scheme will be available.

During construction phases, the number of HGV and construction worker vehicle movements will be similar to that during Vault 9 construction.

Construction Materials

To minimise the impact of construction, materials will be imported to the LLWR by rail and stockpiled prior to the commencement of each phase of construction, in sufficient quantities to allow construction periods to be optimised.

Working hours (construction)

- Monday to Friday 07:30 to 18:00 hours.
- Saturday 07:30 to 13:00.
- No working at any other times including Sundays and Bank Holidays unless agreed in advance with Cumbria County Council.

Noise

Noise levels and potential impacts during construction have been assessed at the nearest residential receptors.

Temporary local noise barriers shall be utilised where necessary shielding items of plant / construction activities. This will ensure that construction noise impact on residential properties is minimised.

Based on the predicted noise levels from plant, all works should be within acceptable thresholds for construction works with mitigation with the exception of works associated with vegetation clearance and cap edge construction during Phase 1, which will remain within the limits for temporary construction works.

Cumulative noise impacts associated with magazine demolition during Phase 2 are assessed as being negligible.

Dust

The assessment of air quality (dust) impacts has confirmed that all construction and operational air quality effects following mitigation by good construction management are considered to be negligible.

Screening

Construction of the edges of the cap will increase the height of the existing trench cap and provide screening of cap placement on the trenches and higher stacking from both Summer View and Stubble Green. Where necessary, temporary grassed mounds will be used to screen construction operations from more distant residential locations.

Higher stacking will not commence in any vault until the adjacent trench cap is completed, screening stacking operations from residential views.

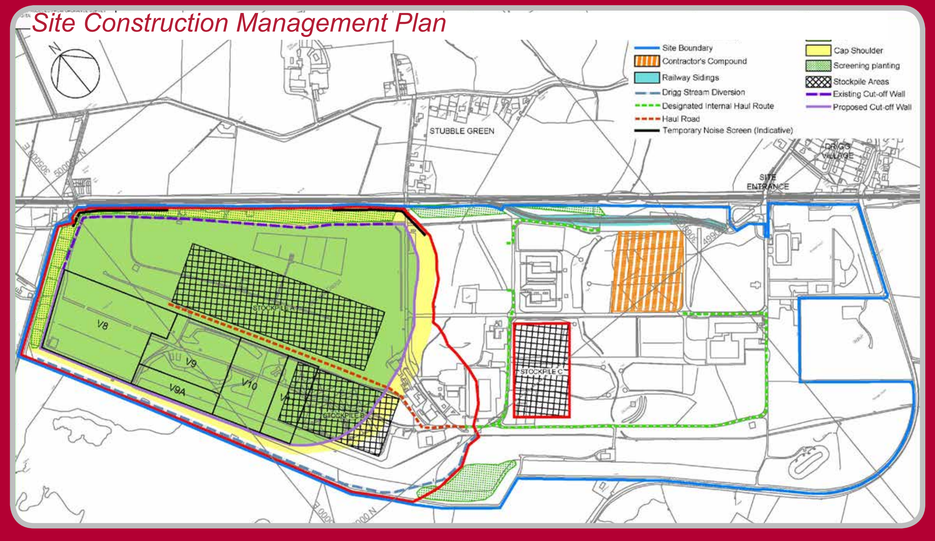
Construction of the edges of the cap will require removal of existing screening planting on the north and east sides of the trenches. This screening belt will be replanted as soon as the soil is restored and will provide screening from Phase 2 onward as vegetation matures.

Additional screening vegetation will be planted on the boundary of the site to the east of the stockpiles and to the south of the Magazines to minimise visual impacts from Stubble Green and Sandy Acre respectively.

Incorporation of Lessons Learnt

Prior to and during each phase of construction, a review of lessons learnt will be undertaken and where appropriate be incorporated into future works.

Site Construction Management Plan



Have Your Say

Get Involved

LLW Repository Ltd is committed to consulting with the local community and interested stakeholders and would like to hear your views about its proposals. Please feel free to speak to members of the team who are on hand today to answer your questions and to listen to your comments.

You can also submit your views on the proposals by completing a Comment Form before you leave the exhibition or returning one by post. Alternatively you can write to us at:

by email:

planningconsultation@llwrsite.com

by post:

Cath Giel
LLW Repository Ltd
Pelham House
Pelham Drive
Calderbridge
Seascale
Cumbria CA20 1DB

Next Steps

All comments will be reviewed and incorporated into the proposals wherever possible prior to a planning application being submitted to Cumbria County Council. Comments will be included in a Statement of Community Involvement which will accompany the planning application and explain how LLW Repository Ltd has involved and informed the community and local stakeholders of its proposals.

LLW Repository Ltd intends to submit the planning application to the County Council in October 2015 and you will have another opportunity to comment on the proposals directly to the Council at that stage. The expected timetable for the development is as follows;

- **September to mid-October 2015**
  Finalisation of the planning application
- **Mid-October 2015**
  Submission of the application to Cumbria County Council
- **February 2016**
  Earliest planning decision
- **Summer 2016**
  Earliest construction commencement (Phase 1)

The exhibition is also available to view online at the LLW Repository Ltd website:

www.llwrsite.com

Annex D: Feedback Forms

LLWR Site Optimisation and Closure Works

Feedback Form

LLW Repository Ltd

Thank you for attending this consultation event. Now that you have seen our proposals, please let us know what you think about them. We are keen to gather your views and would be grateful if you could spare a few minutes to record your comments below.

You can submit your views by:

At the exhibition:
Just put your form in the comments box

By Post:
Cath Giel
LLW Repository Ltd
Pelham Drive, Pelham House
Calderbridge
Seascale
Cumbria CA20 1DB

By e-mail:
planningconsultation@llwrsite.com

Name: .....

Address:.....

.....

.....

Postcode: .....

E-mail: .....

Local Resident ☐

Local Business owner ☐

Member of community group ☐

Councillor ☐

Other ☐

1) Do you support the proposed LLWR site optimisation and closure works?

Yes ☐ **No** ☐

2) If you answered No to Question 1, what would enable you to support the proposals?

3) Are there any specific issues that need to be considered in the planning application?

4) Is there anything you would like to see included to improve the proposals?

5) Do you have any other comments?

Thank You

LLW Repository Ltd

Appendix 4: Waste Arisings Paper

LLW Repository Ltd

LLW Repository, Holmrook, Cumbria:

Site Optimisation and Closure Works

Need for Disposal Capacity at the LLWR

RP/340737/PROJ/00033 Version 2

January 2015

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Objective

The objective of this document is to present projected fill dates for existing and potential future vaults at the Low Level Waste Repository (LLWR), based on the latest available information, and discuss the uncertainties in the projected dates. The paper has been produced to provide information to Cumbria County Council planning officers relating to the need for future vaults at the LLWR. Following discussions with Council planning officers based on Version 1 of this paper, a new section has been added providing fill dates based on adjusted vault volumes (some other minor additions and revisions have also been made).

Background

The LLWR submitted to the Environment Agency a new Environmental Safety Case for the LLWR in May 2011 (the '2011 ESC').

The 2011 ESC assessed two different sized repositories with different numbers of vaults, covering a Reference Disposal Area (RDA) and an Extended Disposal Area (EDA).

The RDA repository comprised the trenches used for disposal up to 1995 and seven vaults, Vaults 8 to 14, of which the first two have already been constructed. The trenches and these vaults cover what was formerly known as the 'Consented Area', with future vaults constructed south of the existing vaults down to approximately the end of the trenches. The EDA repository included six more vaults than the RDA repository. The EDA repository comprises Trenches 1 to 7 and Vaults 8 to 20.

A repository covering the RDA would have the physical capacity to take all the UK's Low Level Waste (LLW) arising up to about 2080, depending on a number of future decisions about LLW management, including the extent to which waste segregation and treatments are applied. The assessment for a repository covering the EDA was undertaken to investigate whether all the LLW in the United Kingdom's Radioactive Waste Inventory (UKRWI) requiring vault disposal could be safely disposed at the site, excluding very low activity waste and wastes where an alternative route is available or is planned to be available. The UKRWI has arisings up to about 2130 and taking all waste requiring vault disposal at the LLWR would extend the lifetime of the repository out to the same date. Much of the capacity in the additional vaults for the EDA repository would be required for the 'final stage' decommissioning wastes from the UK's gas-cooled reactors.

The 2011 ESC also assessed the impacts from four different inventories of waste to explore the implications of uncertainties in future inventories of disposed wastes. The four inventories were referred to as Cases A to D in the 2011 ESC. Case A was treated as the reference case. In order to calculate the distribution of waste materials including radionuclides between different vaults, an inventory model called PIER (Projected Inventory Evaluation Routine) [2] was created using Excel. Assumptions were made about the extent of waste diversion and treatment and packing fractions in waste containers and in the vaults in order to calculate the physical volumes occupied by the disposed wastes in the vaults. The PIER model was also used to calculate the fill dates of the vaults under the assumptions of the different inventory cases.

The UKRWI is revised and published every three years. The 2011 ESC was based

on the 2007 UKRWI (the 2010 version was not available before 'data freeze' in 2010 for the ESC).

Soon after the submission of the 2011 ESC, an associated planning application for the works necessary to develop and close the LLWR was submitted to Cumbria County Council. This application was based on the RDA repository and the reference Case A inventory.

The PIER calculations for the 2011 ESC have been updated for this document, based on the latest 2013 UKRWI and experience of the effects of waste diversion and treatment gained since the 2011 ESC.

PIER Model

The PIER model and its application in the 2011 ESC are described in references [1] and [2]. This section summarises this information.

PIER provides, as output: the volumes of primary and secondary wastes disposed to LLWR each year, taking account of waste processing, diversion and treatment, and quantities of radionuclides disposed of to LLWR annually. In addition, PIER determines the inventories and fill dates of individual vaults based on information on the available capacity of vaults and packing fractions. The information about the radiological and materials inventories of each vault is then used as input to impact assessment models.

The analysis undertaken by the PIER model uses information from the UKRWI. The UKRWI is the best available source of data on future waste arisings in the UK. Each waste producer is required by the Government to provide detailed information on the nature and volumes of future waste arisings. The UKRWI identifies the nature of the waste materials, for example, of what type of metal they are comprised, as well as radiological content.

The inventory used in the 2011 ESC was based on the 2007 UKRWI and assumptions about waste diversion and treatment made at the time of development of the ESC. It includes all the material identified as LLW unless it has an alternative identified in the UKRWI, e.g. the new Dounreay facility, CLESA at Sellafield, and Clifton Marsh. It assumes no LLW will be diverted to a possible deep geological repository and will be disposed at LLWR. In addition, it assumes all Very Low Level Waste (VLLW) and similar low-activity LLW streams will be diverted to alternative landfill facilities. For the remaining waste streams, PIER makes assumptions about the reductions in physical volume of the wastes resulting from supercompaction, such as that provided by the Waste Monitoring and Compaction (WAMAC) facility at Sellafield, or incineration of organic wastes in various different facilities in the UK or abroad, and metal treatment such as provided by the Studsvik Lillyhall facility in Cumbria or metal melting facilities, all currently abroad. PIER processes the waste based on the following steps:

- Segregation of the waste stream into its component material types;
- Assignment of each material type to a processing route;
- Processing each material type to generate secondary wastes;
- Disposal of secondary wastes and any unprocessed primary wastes.

The volumetric changes to the raw waste before disposal due to processing, diversion and treatment are calculated by application of a number of multiplicative

factors. Finally, factors are applied to take account of the packing fractions of wastes in ISO containers and ISO containers in the vaults. The factors used are listed in Table 1.

The values of the factors used for the 2011 ESC are given in column two of Table 1. These factors were based on:

- a judgment about the extent of waste segregation that would be achieved over time;
- assumptions about routing of different types of materials;
- evidence from existing treatment facilities in the case of volume reductions resulting from treatment;
- judgments about the packing fractions of wastes in containers and containers in vaults, partly based on engineering design information.

Table 1 Waste processing factors

Factor	2011 ESC Value	New Value	Reason for change
Percentage of treatable waste segregated	75%	75%	There are no new data that would cause a change to this factor
Assumed routing for: Graphite	100% untreated	100% untreated	There are no new data that would cause a change in the assumption that graphite waste would not be treated
Assumed routing for: Metals	100% smelting	100% smelting	There are no new data that would cause a change in the assumption that metallic waste is all processed via this route
Assumed routing for: Oil	100% incineration	100% incineration	There are no new data that would cause a change in the assumption that oils are all processed via this route
Assumed routing for: 'Other'	100% untreated	100% untreated	The cautious assumption that all 'other' wastes are untreated is still valid
Assumed routing for: Plastic/rubber	50% compaction and 50% incineration	5% compaction and 95% incineration	Understanding based on utilisation of the treatments routes suggests the main treatment route will soon be incineration

Factor	2011 ESC Value	New Value	Reason for change
Assumed routing for: Soft organics	50% compaction and 50% incineration	5% compaction and 95% incineration	Understanding based on utilisation of the treatments routes suggests the main treatment route will soon be incineration
Assumed routing for: Soil/rubble	100% untreated	100% untreated	There are no new data that would cause a change in the assumption that soils and rubbles would not be treated
Assumed routing for: Wood	50% compaction and 50% incineration	5% compaction and 95% incineration	Understanding based on utilisation of the treatments routes suggests the main treatment route will soon be incineration
Assumed routing for: Unknown material	100% untreated	100% untreated	The cautious assumption that all 'unknown' wastes are untreated is still valid
Volume of secondary waste: Compacted puck	20%	20%	There are no new data that would cause a change to this parameter
Volume of secondary waste: Incinerator ash	1.5%	1.5%	There are no new data that would cause a change to this parameter
Volume of secondary waste: Incinerator filter	1.5%	1.5%	There are no new data that would cause a change to this parameter
Volume of secondary waste: Smelting slag	2.5%	2.5%	There are no new data that would cause a change to this parameter
Volume of secondary waste: Smelting filter	2.5%	2.5%	There are no new data that would cause a change to this parameter
Radionuclide distribution to: Puck	100%	100%	There are no new data that would cause a change to this parameter
Radionuclide distribution to: Incinerator ash	80% (assumed 20% to filter)	80% (assumed 20% to filter)	There are no new data that would cause a change to this parameter
Radionuclide distribution to: Smelting slag	90% (assumed 10% to filter)	90% (assumed 10% to filter)	There are no new data that would cause a change to this parameter

Factor	2011 ESC Value	New Value	Reason for change
Compaction first utilised in	2005	2005	There is no change to this parameter as this route is already fully utilised
Incineration first utilised in	2010	2008	This parameter has been changed to reflect the expected reduction in the use of the compaction route in favour of incineration
Smelting first utilised in	2009	2011	This parameter has been changed to reflect the rapid increase in use of smelting
Compaction fully utilised by	2006	2006	There is no change to this parameter as this route is already fully utilised
Incineration fully utilised by	2015	2020	This parameter has been changed to reflect the expected reduction in the use of the compaction route in favour of incineration
Smelting fully utilised by	2015	2012	This parameter has been changed to reflect the rapid increase in use of smelting
Max fraction treated: Compaction	100%	100%	There are no new data that would cause a change to this parameter
Max fraction treated: Incineration	80%	95%	Understanding based on utilisation of the treatments routes suggests maximum fraction of waste treated will be greater
Max fraction treated: Smelting	60%	70%	Understanding based on utilisation of the treatments routes suggests maximum fraction of waste treated will be greater
Packing fraction into a vault	0.855	0.855	There are no new data that would cause a change to this parameter

Factor	2011 ESC Value	New Value	Reason for change
Packing fraction into a container	0.600	0.472	Analysis of data for disposals indicates the packing fraction is less than assumed in the 2011 ESC
Remaining capacity in Vault 8	121596 (m^3)	12000 (m^3)	It is expected that the extent of higher stacking undertaken in Vault 8 will be less than assumed in the 2011 ESC and hence leads to a reduced available space for disposals

Volumes of the secondary wastes given in Table 1 are the percentages of the volumes of wastes before treatment, for example, a disposed compacted puck is assumed to have 20% of the volume of the uncompacted puck. The PIER model makes assumptions about the ramp up in use of treatment services to reflect their start and increasing use, hence parameters are required to be set on the dates of first use and full utilisation of each type of service. Although it may be possible to segregate wastes, it may not be possible because of the acceptance criteria of the treatment services to treat all the segregated wastes, hence there are 'Max fraction' parameters giving the fraction of segregated wastes assumed to be treated. Wastes will not completely fill the internal volume of a waste container and hence a 'Packing fraction into a container' needs to be set in the model. Also, the difference between the internal and external volumes of a container and the efficiency with which containers can be placed to fill the envelope volume of a vault need to be taken into account. These factors are accounted for using a single parameter, 'Packing fraction into a container'.

The calculation of the waste volume that can be emplaced in an individual vault takes account of the packing efficiency of waste into containers and of containers into the vault. The actual 'air space' volumes of each vault for the receipt of waste is taken from the design assumed in the 2011 ESC and planning application, see Table 2. The volume of Vault 8 given in Table 2 is the total volume available (assuming maximum higher stacking); the remaining available volume assumed is given in Table 1.

Table 2 2011 ESC vault disposal capacities

Vault	Volume (m^3)[1]
Vault 8	308,000
Vault 9	247,000
Vault 9A	23,000
Vault 10	171,000
Vault 11	120,000
Vault 12	125,000
Vault 13	141,000

Vault 14	162,000
Vault 15	*153,000**
Vault 16	*98,000**
Vault 17	*122,000**
Vault 18	*72,000**
Vault 19	*67,000**
Vault 20	*61,000**

1 Air space volumes to the nearest 1000 m^3
* The EDA vaults would be higher stacked to accommodate the increased waste relating to Case B (see below)

Four high-level inventory cases were considered in the 2011 ESC to give an insight into uncertainties over future waste arisings:

In summary Case A is based on:

- Inclusion of all materials identified in the UKRWI as LLW unless it can be confidently assumed that they will be routed elsewhere.
- Exclusion of all waste streams comprising of very low active wastes on the basis that these will be more appropriately disposed of to a facility other than LLWR.
- Inclusion of all waste streams in the UKRWI arising from the management of contaminated land (with the exception of waste from Dounreay and a small amount from Sellafield assumed to be disposed locally).
- Inclusion of LLW identified as routed to the deep Geological Disposal Facility.
- Inclusion of 'orphan' wastes (i.e. those with no routing information).
- Exclusion of new build wastes.

Case A was taken as the 'Reference Case', and was intended as a representation of a reasonable bounding case for wastes in the UKRWI. Case B considers the effects of a new nuclear build programme on the inventory of LLWR. Case C addresses the effects of uncertainties in the disposed volume to illustrate the effects of VLLW diversion, and Case D considers the effects of alternative routing for some waste streams associated with the management of contaminated land. Case B assumed a fleet of eight new reactors. Case C assumed an arbitrary 25% reduction in physical volume (but not radioactivity).

The vault fill dates calculated using the PIER model for the four cases are given in Table 3.

Table 3 2011 ESC fill dates for vaults

Vault	Fill date (†)			
	Case A	Case B	Case C	Case D
8	2011	2011	2013	2012
9*	2022	2022	2026	2022
10	2027	2027	2031	2028
11	2030	2030	2047	2039

12	2034	2034	2076	2057
13	2053	2052	2087	2077
14	2077	2076	2101	2089
15	2086	2087	-	-
16	2092	2094	-	-
17	2100	2101	-	-
18	2106	2107	-	-
19	2111	2112	-	-
20	2126[$]	2127	-	-

† Dates rounded to last year in which disposals occur
* Includes Vault 9A
- Only Cases A and B were included in the EDA assessment
$ PIER calculates that approximately 10 m^3 of waste will not fit in Vault 20, in effect the fill date is 2127

Revised Results for Vault-fill Dates

The vault-fill dates have been recalculated using the latest available inventory data, from the 2013 UKRWI. The multiplicative factors have also been revised based on experience thus far in application of waste diversion to landfill, incineration and metal treatment (supercompaction has been in use since the mid-1990s), and packing efficiency in containers. Information on waste diversion, treatment and disposal in the period April 2012 to September 2014 has been used. The revised factors are given in the third column of Table 1, with an explanation given in the fourth column.

The revised results for vault-fill dates are given in Table 3. Only results for inventory Cases B and C are given. It now seems much more likely that there will be a fleet of new reactors and hence it is reasonable to now use Case B as the reference case (although the difference in fill dates between Cases A and B is small, less than a year for early vaults when only small amounts of operational wastes are being created – see Table 2). Case C, illustrative of large amounts of VLLW diversion from LLW streams not labelled as very low activity streams, has now been adjusted to include the fleet of new reactors.

Case B suggests that Vaults 10, 11 and 12 will be required to be constructed before 2050 although it is possible that some segregation of VLLW out of LLW streams will be achieved although not necessarily to the extent assumed for Case C. Segregation of LLW out of Intermediate Level Waste (ILW) streams would counter this effect – see below.

Table 3 Revised fill dates for vaults

Vault	Fill Date	
	Case B	Case C
8	2013	2013
9	2023	2028
10	2035	2051

11	2048	2076
12	2073	2081
13	2077	2090
14	2086	2095
15	2090	2100
16	2092	2103
17	2095	2113
18	2097	2129
19	2098	-
20	2099	-
21	2129	-

A profile of volumes of waste requiring disposal at the LLWR is given in Figure 1. The volumes shown are those of the wastes after diversion and treatment but do not include associated packaging volumes, i.e. the volumes are those of the wastes and not the containers of wastes. The initial spike arises because the PIER model assumes all 'stock' wastes arrive straightaway. The total volume of wastes has increased in the 2013 UKRWI from the 2007 UKRWI but the waste arisings in earlier decades have reduced.

Figure 2 gives the percentage breakdown by material type for the wastes before any diversion and treatment other than diversion to other disposal facilities. The diversion to other facilities includes that of the low-activity wastes to landfill. The information is for wastes arising out to the 2129 end date of the 2013 UKRWI. The total volume of the waste is 1,160,018 m^3. Figure 3 gives the same information but for wastes arising up to 2050, the total volume of waste in this case being 402,632 m^3.

Figures 4 and 5 give the sources of these wastes by organisation.

Figure 1 Profile of waste arisings

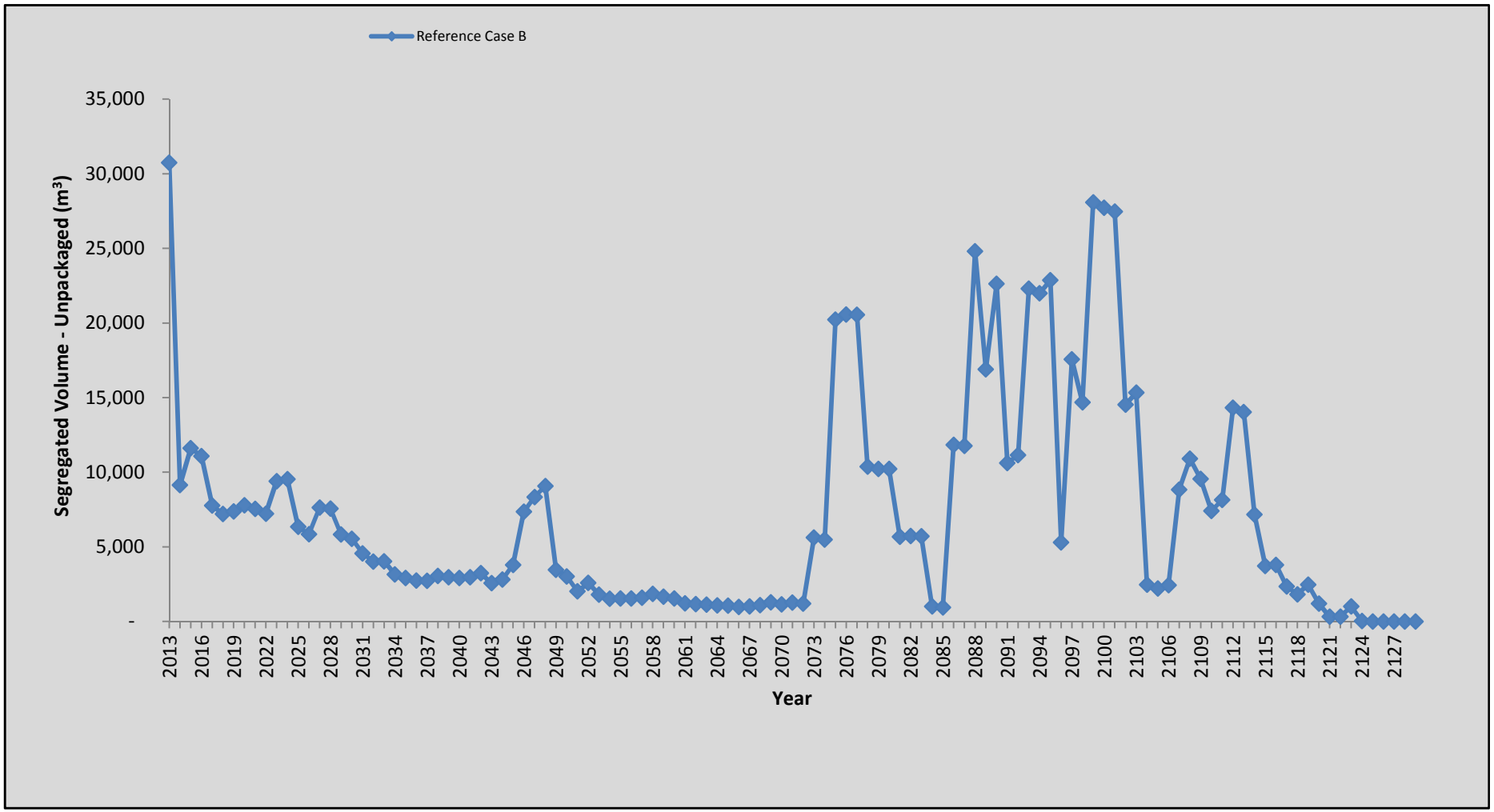


Figure 2 Waste composition – inventory to 2129

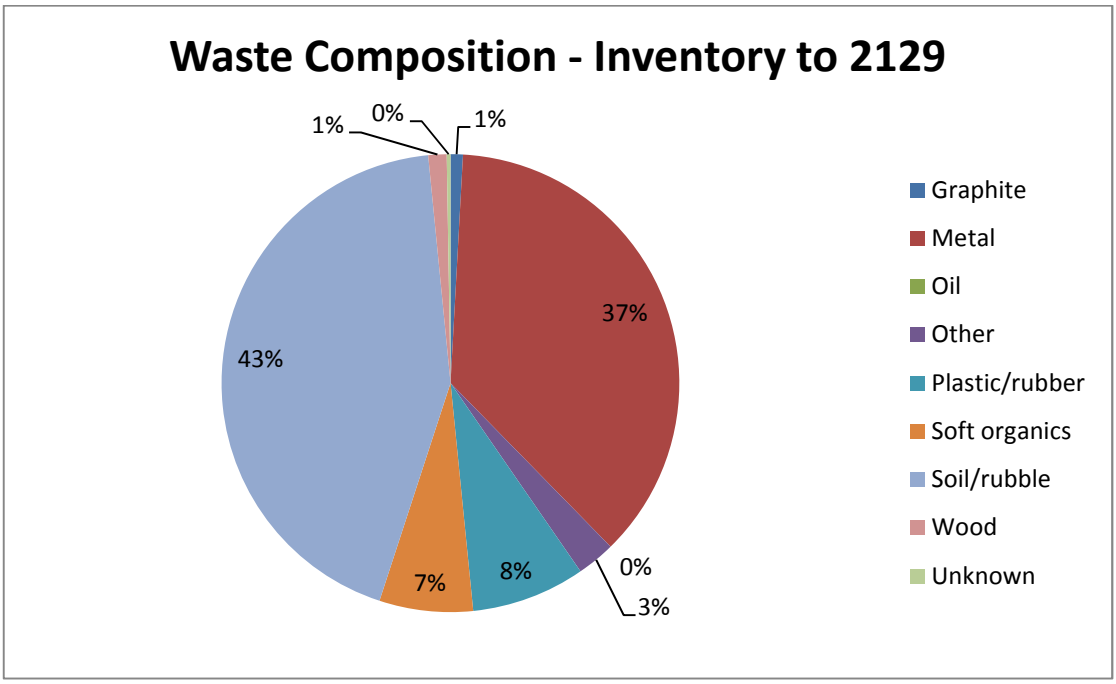


Figure 3 Waste composition – inventory to 2050

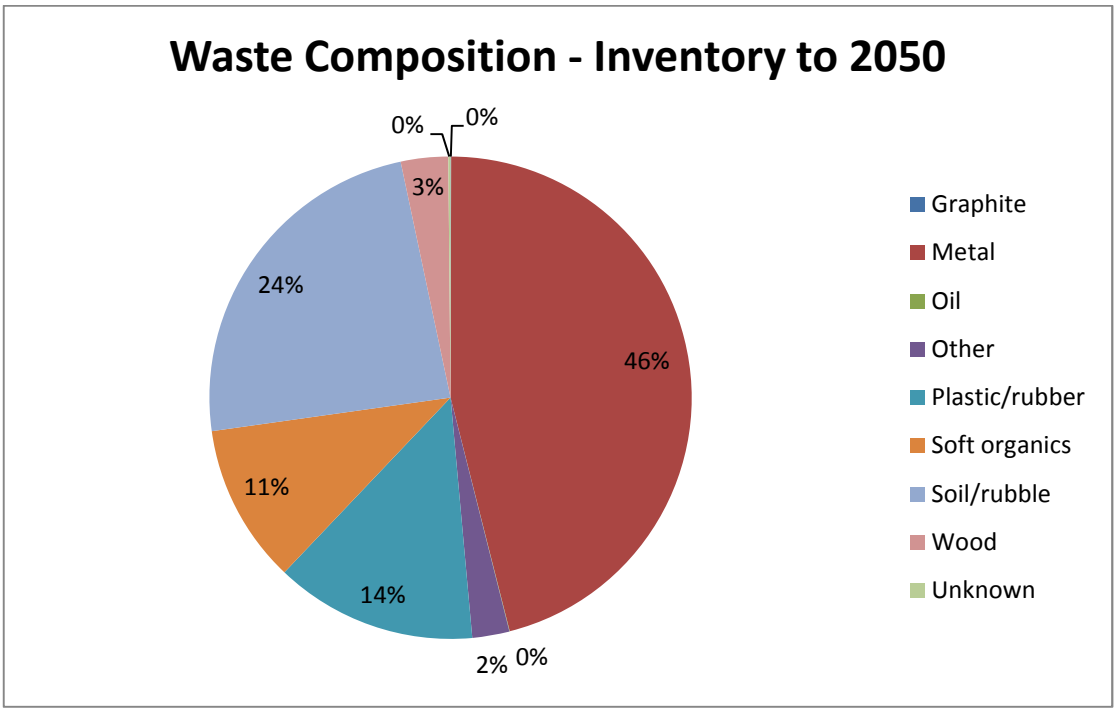


Figure 4 Waste consignors – inventory to 2129

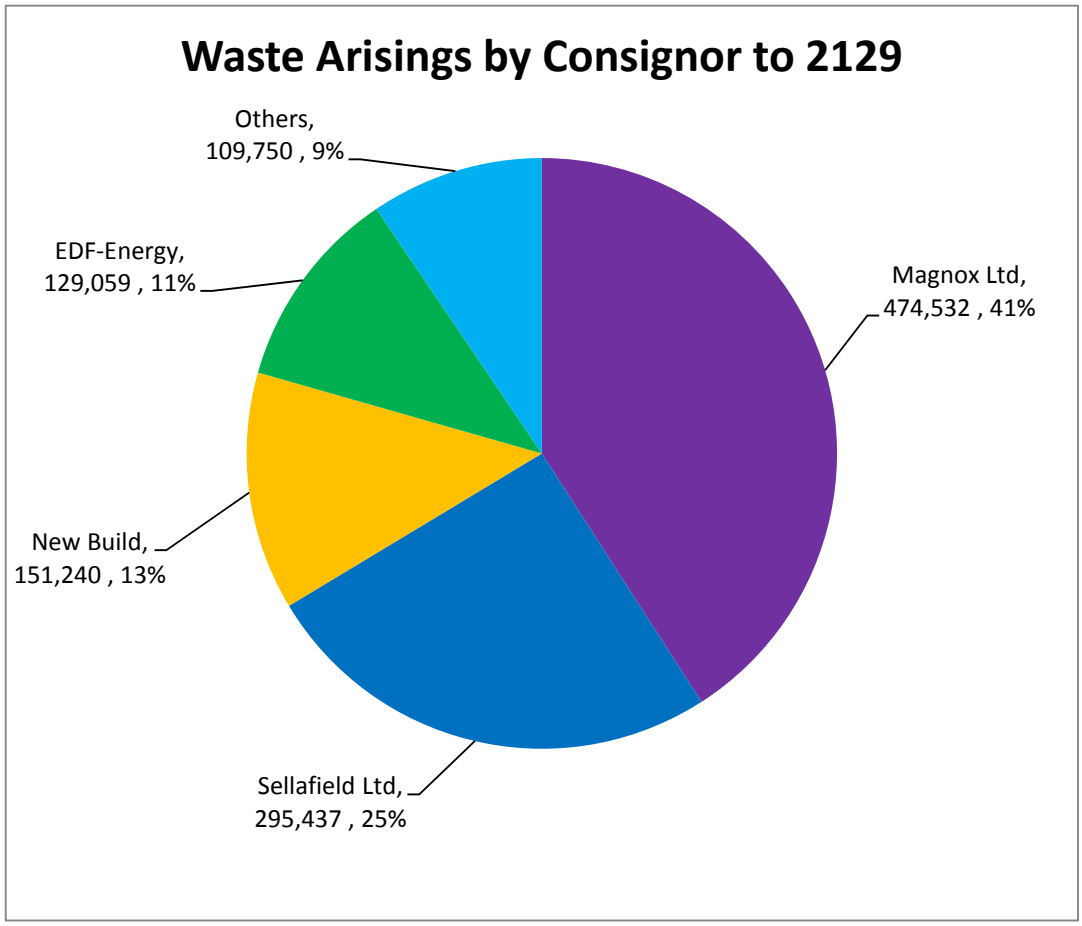
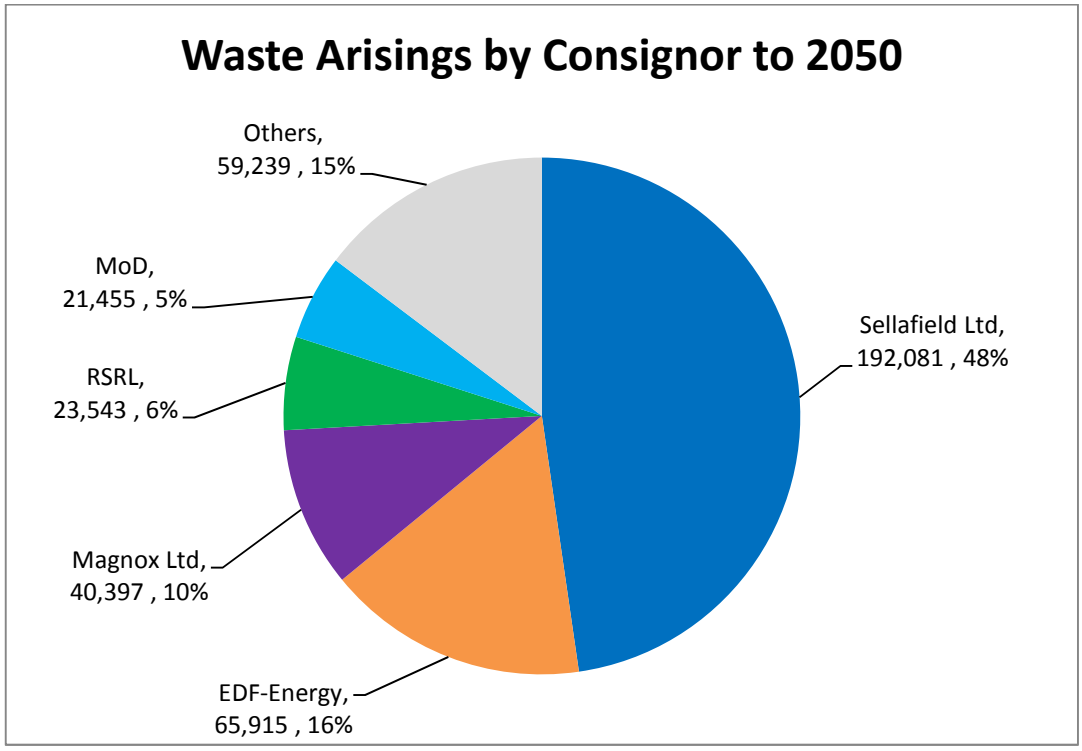


Figure 5 Waste consignors – inventory to 2050



Discussion of Uncertainties

There are a number of factors that lead to uncertainties in the volumes and timescales of arisings of wastes needing disposal at the LLWR. Uncertainties are discussed in this section.

The effect of some uncertainties can be explored using the PIER model and these are discussed first. Only ones where it is judged that the uncertainties have the potential to cause a significant effect are considered here. Case B is used as the reference case.

It was assumed for the 2011 ESC that all available space above Vault 8 in the final cap profile would be higher stacked with waste containers. Within the context of the ESC, this maximised the radiological inventory in Vault 8. It is unlikely that it will be possible to use all the available space because insufficient waste containers will be received before the vault needs to be closed. It has been assumed in the revised PIER calculations that all the currently stored waste containers in Vaults 8 and 9 plus six hundred new containers would be disposed in Vault 8 (see Table 1). It is currently unclear whether or not it will be possible to justify higher stacking of waste in Vault 8 because of uncertainties in the amount of voidage in existing waste containers (not accepted under the new Waste Acceptance Criteria derived from the 2011 ESC), which affect final cap performance. An illustrative calculation has been undertaken assuming no higher stacking in Vault 8. The available disposal volume in Vault 8 has been reduced in the calculation to that provided by the small volume at the north end of Vault 8 where no waste is currently disposed (6,000 m^3). The available volume in Vault 9 has been reduced by the volume of waste containers currently higher stacked in Vault 8 and stored in Vault 9 (36,000 m^3). The results are given in Table 4. The decrease in available disposal space leads to the earlier filling of most vaults by a few years.

Table 4 Effect of no higher stacking Vault 8

Vault	Fill Date	
	Reference Case B	No higher stacking in Vault 8
8	2013	2013
9	2023	2021
10	2035	2031
11	2048	2046
12	2073	2062
13	2077	2076
14	2086	2082
15	2090	2089
16	2092	2091
17	2095	2094
18	2097	2095
19	2098	2097

20	2099	2099
21	2129	2129

In order to enable diversion of wastes for incineration or metal treatment, the treatable wastes must be segregated. For a range of practical and safety reasons, complete segregation is often not possible. For the 2011 ESC, it was assumed that wastes can be segregated with a 75% efficiency and hence organic materials and metals may potentially be diverted for treatment. Available evidence has not suggested any reason to change this factor and the revised calculations reported above assumed the same 75% segregation factor (see Table 1). The choice of 75% is to some extent a judgment. Two further calculations have been undertaken, reducing the factor to 50% in one case and increasing it to the maximum possible 100% in the other. The results are given in Table 5. The results show that the efficiency of segregation does have a significant effect on vault-fill dates. The unrealistic assumption of complete segregation would still require Vault 11 to be constructed before 2050.

Table 5 Effects of altered waste segregation efficiency

Vault	Fill Date		
	Reference Case B – 0.75 Segregation Factor	**0.50 Segregation Factor**	**1.00 Segregation Factor**
8	2013	2013	2013
9	2023	2021	2027
10	2035	2028	2048
11	2048	2038	2075
12	2073	2048	2077
13	2077	2073	2086
14	2086	2077	2090
15	2090	2085	2094
16	2092	2088	2097
17	2095	2090	2099
18	2097	2092	2101
19	2098	2094	2102
20	2099	2095	2103
21	2129	2129	2129

A factor that has a significant effect on the quantities of waste that can be disposed in a vault is the packing fraction of waste in a disposal container. A packing fraction of 60% (of the internal volume of a container) was assumed in the 2011 ESC. It was recognised at the time that this was much higher than had been achieved in practice but it was thought that over the assumed hundred-year operational lifetime of the Repository more efficient packing of waste in a vault might be achievable. However, no evidence of an improvement has been seen thus far and on reflection 60% is an ambitious target certainly in the near future. For the revised calculations, where the interest is in the shorter-term, it seems appropriate to select a packing fraction being

achieved now. Based on data on the amounts of grout used to fill the voidage in containers over the last two and half years, a packing fraction of 47% has been calculated and this fraction was used in the revised calculations (see Table 1). Two further calculations have been undertaken to illustrate the effect of this packing fraction, one with the 2011 ESC value of 60% and another with a reduced value of 40%. This latter value has been advised to LLWR as Magnox Ltd's planning assumption. Magnox Ltd is the largest source of LLW in the UKRWI. The results are given in Table 6. If Magnox Ltd's baseline assumption is correct for future waste disposals, Vault 13 would be required to be constructed by 2050. Even with an approximately 30% improvement in packing fraction (from 47 to 60%), construction of Vault 11 would still be required before 2050.

Table 6 Effects of container packing efficiency

Vault	Fill Date		
	Reference Case B – 0.472 Packing Factor	0.40 Packing Factor	0.60 Packing Factor
8	2013	2013	2013
9	2023	2021	2027
10	2035	2029	2048
11	2048	2040	2075
12	2073	2049	2078
13	2077	2074	2088
14	2086	2077	2093
15	2090	2083	2097
16	2092	2088	2100
17	2095	2090	2102
18	2097	2091	2107
19	2098	2093	2111
20	2099	2094	2114
21	2129	2129	2129

The efforts by the Nuclear Decommissioning Authority (NDA), waste producers and the LLWR to encourage and enable much improved waste diversion and treatment over the last few years have led to significant reductions in the amounts of waste being disposed at the LLWR. It should be recognised, however, that the overall volumes of radioactive waste are small compared with other wastes and the supply chain providing incineration and metal treatment is not robust. There are only a small number of service suppliers. Any one of a number of problems could lead to at least reduced diversion and treatment permanently or for a significant length of time. To illustrate the importance of treatment and diversion, a calculation has been undertaken assuming no incineration of organic materials and metal treatment (but retaining diversion of VLLW to landfill). The results are given in Table 7. With no incineration and metal treatment, construction of Vault 15 would need to begin before 2050.

Table 7 Effects of no waste diversion for incineration or metal treatment

Vault	Fill Date	
	Reference Case B	No Waste Diversion
8	2013	2013
9	2023	2019
10	2035	2024
11	2048	2028
12	2073	2032
13	2077	2042
14	2086	2051
15	2090	2074
16	2092	2076
17	2095	2079
18	2097	2081
19	2098	2086
20	2099	2088
21	2129	2129

Illustrative calculations have also been undertaken with the PIER model to show the effects of complete segregation and treatment of all organic and metal wastes. The results for both Cases B and C are shown in Table 8. In the reference Case B, construction of Vault 11 is still required before 2050. In Case C, where the unrealistic assumption of complete diversion and treatment of organic and metal wastes is made, along with 25% of the waste in LLW streams being segregated into VLLW and diverted to landfill, construction of Vault 10 would still be required before 2050.

Table 8 Complete segregation and treatment of organic and metal wastes

Vault	Fill Date		
	Case B (reference)	Case B (complete segregation)	Case C (complete segregation)
8	2013	2013	2013
9	2023	2027	2040
10	2035	2048	2076
11	2048	2075	2081
12	2073	2077	2089
13	2077	2086	2094
14	2086	2090	2100
15	2090	2094	2108

16	2092	2097	2129
17	2095	2099	2113
18	2097	2101	2129
19	2098	2102	-
20	2099	2103	-
21	2129	2129	-

The above discussion focusses on the uncertainties associated with specific parameters in the PIER model. It is also appropriate to consider the overall accuracy of the model. It is possible to examine bulk volumes of wastes disposed and diverted to gain some insight into the overall level of success of diversion and treatment and the accuracy of the data and assumptions used in the PIER model calculations. It should be noted that whilst the efforts to divert and treat wastes have clearly been very successful, the extent of that success is difficult to analyse in detail at a UKRWI waste stream level because data relating to which waste streams diverted wastes are derived from are not available.

Table 9 shows the total volumes of wastes disposed and diverted to different management routes in the period April 2012 to September 2014.

Table 9 Wastes disposed and diverted

Management Route	Volume (m^3)	Percentage
Disposal at LLWR	5,051	20
Metal treatment	4,739	19
Incineration	4,938	20
Landfill disposal	10,053	41

The revised PIER model calculations suggest that approximately 35,000 m^3 of waste should have arisen with 25,000 m^3 being for disposal over the two-and-half-year period. These volumes exclude wastes from low-activity LLW streams. The 10,000 m^3 difference compares well with the data given in Table 9 for metal treatment and incineration, however, it is not known what fraction of these treated wastes originated from low-activity LLW streams that the PIER model assumes would be diverted to landfill (in Case B). It should also be noted that recent actual data and future estimates are being compared here.

The landfill disposal figure in Table 9 includes waste labelled as low-activity LLW in the UKRWI. It is not in general known whether the approximately 10,000 m^3 of low-activity LLW shown in Table 9 was derived from low-activity LLW streams or from segregation of low-activity LLW out of waste streams labelled LLW in the UKRWI. It is known that approximately 5,000 m^3 was derived from a single RSRL Ltd VLLW stream (5C300). Hence, up to 5,000 m^3 may be waste segregated and diverted from LLW streams, reducing the apparent over-estimation of wastes for disposal.

There are a number of further possible reasons for the over-estimate of disposal volumes. One is simply that there are over-estimates of waste volumes in the underlying UKRWI. On the other hand, it may be that waste consignment may be slower than assumed overall for the UKRWI either because of slower progress in decommissioning or the 'levelling' of waste volumes across the life of a waste stream generally assumed in the UKRWI. It is also possible that the NDA's incentivisation of its estate to improve waste diversion and treatment has led to some advanced diversion of divertible and treatable wastes at the expense of wastes requiring disposal. It is plausible to argue that more of the volumes of waste for disposal calculated by the PIER model will still arise.

There are a number of other reasons why the volumes of wastes needing to be disposed over the next few decades might alter and hence the disposal capacity required change. Some of these reasons might lead to significant increases in the need for disposal capacity.

The success in diverting and treating LLW and hence reducing the volume of wastes disposed at the LLWR over the last few years has been noted above. Similar efforts are now being made with wastes currently labelled as Intermediate Level Wastes (ILW). Some of these wastes might now be suitable for disposal at the LLWR for a range of reasons, for example:

- better characterisation;
- segregation out of a LLW portion;
- radioactive decay leading to the wastes meeting the LLW definition.

The LLWR is currently assessing two proposals for disposing of two types of waste from 15 waste streams originally characterised as ILW. These are not included in the PIER calculations.

Some of the low-activity LLW waste streams in the UKRWI have large volumes. It is likely that it will not be possible to divert all these wastes to landfill facilities and that some of this waste will require disposal as LLW at the LLWR.

The LLWR currently receives little NORM (naturally occurring radioactive material) waste for disposal. Most such wastes are not included in the UKRWI and data on their volumes are limited. It is known that there are large volumes that will need management by some route. Some NORM contains significant quantities of radium and the radiological capacity of the LLWR to take radium is limited, nevertheless, LLWR might receive and accede to requests in the future to dispose of more NORM waste.

The waste arising profile in Figure 1 shows that the majority of LLW requiring disposal at the LLWR will arise in the period after about 2070. These wastes largely arise from final stage decommissioning of the United Kingdom's gas-cooled reactor fleet. The assumption underlying the current UKRWI data is that the reactors will be left, after defuelling and initial decommissioning, for some decades before final stage decommissioning. Consideration is being given to bringing forward the final stage decommissioning. Were final stage decommissioning to be accelerated and take place over the next few decades it would lead to very large increases in the disposal capacity required over the same timescales.

Source of the LLW

The LLWR is the United Kingdom's national facility for the disposal of LLW. In the context of the planning application, however, it should be noted that between fifty and sixty percent of the LLW in the 2013 UKRWI arising up to 2050 comes from within Cumbria, the great majority of it from Sellafield and resulting from decommissioning.

Conclusions from Reported Calculations

Based on the results of the revised PIER model calculations presented and discussed above, there is a high probability that in the next few decades up to 2050 there will be a need to construct at least two further vaults, Vaults 10 and 11, at the LLWR and possibly more. In a number of the cases considered here, construction of Vault 12 would be required before 2050.

Whilst there are uncertainties about the volumes and timescales of waste arisings, based on current experience and foreseeable progress with waste diversion and treatment, there is every reason to believe that a number of further disposal vaults will be required and certainly Vaults 10 and 11.

There being less waste than reported in the UKRWI and further improvements in LLW management over those assumed for the revised PIER model calculations might reduce the volumes of waste requiring disposal over the next few decades; however, other uncertainties in waste volumes and timescales of arisings are such that much larger volumes of disposal capacity might be required than would be provided by Vaults 10 and 11.

Based on the revised PIER model calculations, it is likely that Vault 11 will be required to be constructed within the timescales needed to develop an alternative disposal facility. Developing an alternative facility would require engaging with stakeholders, identifying an alternative site, gaining the necessary regulatory and planning permissions, and constructing the facility. These activities would take many years or even decades.

Much of the disposal volume provided by Vaults 10 and 11 will be required for wastes from decommissioning high-hazard facilities at Sellafield.

Results for Reduced Vault Volumes

Following discussions with Council planning officers based on the above results and analysis, two further calculations with the PIER model have been undertaken with adjusted vault volumes. The calculations are based on the suggestion that any planning permission would be time-limited to 2050.

In the first new calculation, the volumes of Vaults 10 and 11 have been reduced such that the disposal volume that would be available in the remaining capacity in Vaults 8 and 9 and any new capacity in Vaults 9A, 10 and 11 is such that it could accommodate the volume of waste arising up to 2050 reduced by ten percent. Were planning permission to be granted for the small additional volume provided by Vault 9A, plus two new vaults with the assumed reduced volume, it would present a further incentive to the industry to reduce the volumes of LLW requiring vault disposal at the LLWR. (Hence, the ten percent reduction has been applied to the wastes

predicted to arise from now, 2015.)

The revised Case B inventory assumed for the results given in Table 3 has been used for both the new calculations. The volume of processed wastes predicted to arise between 2013 (the start of the 2013 UKRWI) and 2050 is 245,000 m^3. With a ten percent reduction in wastes arising from 2015 of 20,000 m^3, the volume of waste that would require disposal is 224,000 m^3 (numbers rounded). The 20,000 m^3 of processed waste requires a vault volume of 50,000 m^3 for disposal.

The vault volumes assumed in the first new calculation are given in Table 10.

Table 10 Revised vault disposal capacities for the ten percent volume reduction to 2050

Vault	Volume (m^3)
Vault 8	308,000
Vault 9	247,000
Vault 9A	23,000
Vault 10	120,000
Vault 11	120,000
Vault 12	125,000
Vault 13	141,000
Vault 14	162,000
Vault 15	153,000
Vault 16	98,000
Vault 17	122,000
Vault 18	72,000
Vault 19	67,000
Vault 20	61,000

The reduced volumes of Vaults 10 and 11, sized for the reduction in the volume of the waste arising by ten percent, are 120,000 m^3 each assuming equal volumes.

The revised fill dates are given in Table 11.

Table 11 Fill dates for vaults for the ten percent volume reduction to 2050

Vault	Fill Date
8	2013
9	2023
10	2030
11	2045
12	2060
13	2076

14	2081
15	2088
16	2090
17	2094
18	2095
19	2097
20	2099
21	2129

With the smaller volume of Vaults 10 and 11, the PIER model calculates that Vaults 10 and 11 will fill at the earlier dates of 2030 and 2045.

For the second new calculation, the volumes of Vaults 10 and 11 have been set to accommodate all the waste calculated to arise to 2050 based on the 2013 UKRWI (and the assumptions in the PIER model discussed earlier in the paper), without any ten percent reduction.

The vault volumes assumed in the second new calculation are given in Table 12.

Table 12 Revised vault disposal capacities to finish filling Vault 11 in 2050

Vault	Volume (m^3)
Vault 8	308,000
Vault 9	247,000
Vault 9A	23,000
Vault 10	162,000
Vault 11	162,000
Vault 12	125,000
Vault 13	141,000
Vault 14	162,000
Vault 15	153,000
Vault 16	98,000
Vault 17	122,000
Vault 18	72,000
Vault 19	67,000
Vault 20	61,000

The volumes of Vaults 10 and 11, sized to ensure Vault 11 is filled during 2050, are 162,000 m^3, assuming equal volumes.

The revised fill dates are given in Table 13.

Table 13 Fill dates for vaults with vault 11 filling in 2050

Vault	Fill Date
8	2013
9	2023
10	2034
11	2050
12	2075
13	2078
14	2087
15	2090
16	2093
17	2095
18	2097
19	2099
20	2100
21	2129

1 Harper A, User Guide for PIER V 2.2: A Tool for Calculating the Forward Inventory of LLWR, Serco/TAS/003756/013 Issue 2, April 2011
2 Harper A, ESC 2011: The Disposed and Forward Inventory, Serco Report Serco/E003756/12 Issue 2, April 2011.