Nuclear Waste Services

DISPOSAL FACILITY INVENTORY

2026 Environmental Safety Case for the LLWR

LLWR/ESC/R(26)10169, May 2026

Conditions of Publication

Preface

The Low Level Waste Repository (LLWR) is the United Kingdom's principal facility for the disposal of solid Low Level Waste (LLW). It is a near-surface disposal facility in which waste was disposed in trenches and is now being disposed in vaults excavated into the ground surface. The LLWR is owned by the Nuclear Decommissioning Authority (NDA) and operated on their behalf by a wholly-owned subsidiary division, Nuclear Waste Services Ltd.

We, Nuclear Waste Services, are committed to operating the LLWR as a safe and efficient facility that provides a continuing option for the disposal of LLW in the United Kingdom. This will be achieved consistent with good practice for the near-surface disposal of radioactive waste, in accordance with environmental, health and safety, and security regulation and guidance, and in compliance with the terms of our Nuclear Site Licence and Permit to dispose of radioactive waste. We are also committed to working with the NDA to ensure optimal use is made of the LLWR to support the NDA's mission, in accordance with government policy. This may involve the disposal of a broader range of wastes than just LLW as currently defined in the United Kingdom[1].

One of the means we use to operate the LLWR safely is to maintain and implement an Environmental Safety Case for the site. This is one of the reports presenting the 2026 Environmental Safety Case for the LLWR – the 2026 ESC. The 2026 ESC is a major update based on a comprehensive review of our previous 2011 ESC and subsequent developments. The 2026 ESC addresses both the environmental safety of the disposal facility and the rest of the site. It considers the disposal of both LLW and some less-hazardous Intermediate Level Waste (ILW). Assessing the disposal of some less-hazardous ILW does not imply any decision has been made to dispose of such waste at the LLWR. The work has been undertaken to understand the safety implications if such a decision were made and hence support consideration of the option by the NDA.

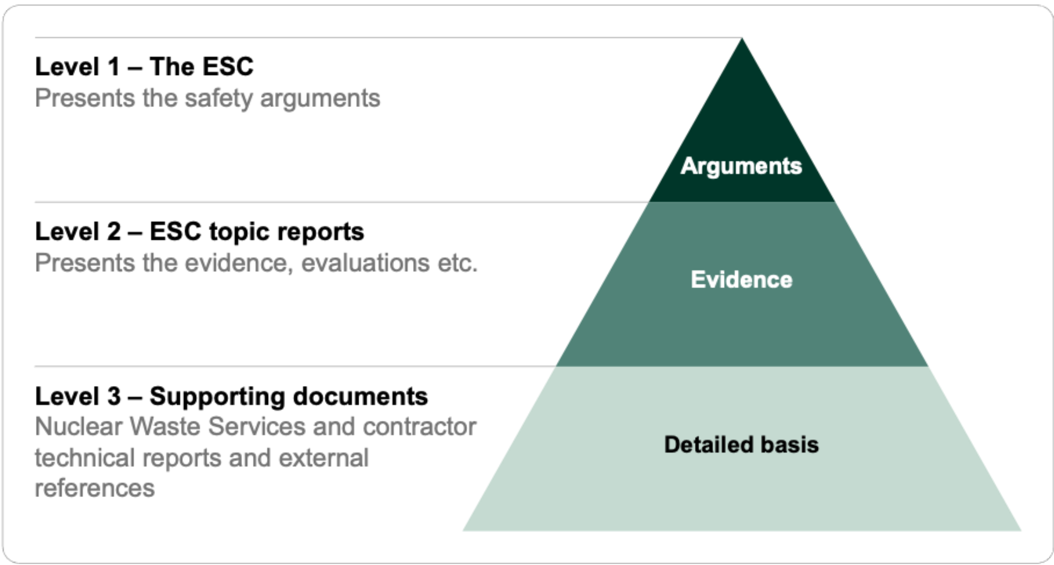
The 2026 ESC is issued under the authority of the Nuclear Waste Services' Executive Director of Sites and Operations.

The 2026 ESC consists of documents at two levels:

- A single 'Level 1' report outlines the plan for the development of the LLWR and the main arguments concerning environmental safety and how it is achieved.
- A series of 'Level 2' reports present the evidence that underpins our safety arguments, including descriptions of our management framework, system understanding, design and management choices, assessments and implementation.

[1] In government policy, LLW is defined as radioactive waste having a radioactive content not exceeding four gigabecquerels per tonne (GBq t^{-1}) of alpha or 12 GBq t^{-1} of beta/gamma activity.

This is the Level 2 report '*Disposal Facility Inventory'*. The ESC Level 1 and 2 reports are listed in the table below, which also shows for the Level 2 reports the set of arguments for which each report mainly provides evidence. A brief description of the contents of each Level 2 report is also given. The ESC is supported by a large number of technical and scientific reports and references that we refer to as 'Level 3' documents. We have also produced a Guide to Key Points of the ESC, to help a wider group of stakeholders understand its nature, conclusions and implications.



Level 1	
Main Report [1]	
Level 2	
Management and dialogue	
Management and Dialogue [2]	Describes our environmental management systems and interactions with regulators and stakeholders
System characterisation and understanding	
Site History and Description [3]	Provides a history and description of the site
Disposal Facility Inventory (this report)	Describes the wastes already disposed and wastes that may be disposed at the facility
Engineering Design [4]	Presents the engineering design of the current facility and proposed changes as further disposal vaults are built and the disposal facility is closed

Near Field [5]	Describes our understanding of the chemical and physical evolution of the engineered disposal system
Hydrogeology [6]	Describes our understanding of the geology and hydrogeology of the site
Site Evolution [7]	Describes our understanding of how the site will evolve, with a focus on coastal evolution
Monitoring [8]	Presents our programme of environmental monitoring supporting the ESC
Optimisation and Site Development Plan	
Optimisation and Site Development Plan [9]	Describes our approach to optimising the design and management of the disposal facility and wider site, and sets out our Site Development Plan
Waste Management Plan [10]	Presents our plans for managing the wastes produced by previous uses and operation of the site
Assessments	
Safety Functions [11]	Presents our understanding of how the different aspects of the repository system and its management contribute to the safety of the facility
Engineering Performance Assessment [12]	Presents our analysis of how the various components of the engineered disposal system will perform, which is an input into our impact assessments
Environmental Safety During the Period of Authorisation [13]	Presents evidence that the LLWR is currently being operated safely and will continue to be so during the period that the facility is permitted
Assessment of Long-term Radiological Impacts [14]	Presents evidence that, if the LLWR is managed in accordance with the Site Development Plan, the site will remain safe in the long term
Hydrogeological Risk Assessment [15]	Presents evidence that the disposal facility protects groundwater from both radiological and non-radiological contaminants in the disposed wastes now and will continue to do so in the future

Assessment of Impacts on Non-human Biota [16]	Presents evidence that the LLWR does not have adverse consequences for non-human biota populations now and will not in the future
Implementation	
ESC Implementation [17]	Sets out how we use the ESC to manage the site, including setting Waste Acceptance Criteria and other controls on the types and quantities of waste accepted for disposal
Audit	
Addressing Regulatory Requirements and Feedback [18]	Provides a cross-reference between the contents of the ESC and regulatory guidance and feedback

Executive Summary

This report describes the Reference Inventory that has been developed to support the Environmental Safety Case (ESC) for the Low Level Waste Repository (LLWR). The Reference Inventory provides key underpinning data for radiological assessments, engineering design and site optimisation and the assessment of non-radiological contaminants. It is our best estimate projection of the waste to be disposed of at the LLWR, consisting of:

- the disposed inventory of the trenches;
- the waste received for disposal in the vaults up to 31st March 2022;
- a projected forward vault inventory developed from the UKRWI, bounded by provisional constraints derived from the ESC and assumptions on waste treatment and diversion.

The inventories disposed to the trenches and the vaults up to 31st March 2022 are collectively referred to as the Disposed Inventory. The projected forward vault inventory is referred to as the Reference Forward Inventory. The Disposed Inventory and the Reference Forward Inventory form the Reference Inventory used in the ESC.

The Reference Inventory also includes an estimate of the quantities of Intermediate Level Waste (ILW) that might be accepted if a decision is taken to accept ILW for disposal at the LLWR. This has been included to enable us to assess the potential impacts of disposal of ILW at the LLWR and thus inform consideration of adopting the option to dispose of a broader range of waste.

Since the 2011 ESC, we have enhanced the reliability and accuracy of the disposed inventory. The key improvements and initiatives carried out to date include the following.

- We have reviewed the methodology used to derive the trench inventory. This involved reviewing the data collected in the RECALL exercise we undertook in 2008 to 2009, where we interviewed current and former workers from Sellafield Ltd and the LLWR to develop a more informed view of trench disposal practices. The review concluded that the estimated uncertainties in trench radionuclide inventories of an order of magnitude remain appropriate.
- We have rederived the disposed vault inventory to reflect an improved understanding of radionuclide and material compositions. For legacy consignments to the vaults, the methods for estimating radionuclide and materials fingerprints have been refined and now rely on data from analogous streams reported in the UK Radioactive Waste Inventory (UKRWI) or waste consignments contained in our waste tracking system.
- We introduced the eMWaste tracking system on 1st April 2018, which replaced the previous Low-Level Waste Tracking System (LLWTS) and provides more detailed

data for recent consignments, enhancing the level of detail in the disposed vault inventory.

- We have introduced improved Waste Consignment Information (WCI) forms that allow us to collect more detailed information from consignors and consequently enhance the quality of the inventory.

We present the key methods and assumptions used to develop the Reference Inventory. For the Reference Forward Inventory, the underpinning dataset was the 2022 UKRWI, which was the most recent UKRWI at the time the work was undertaken. We have worked with waste producers to enhance our understanding of the UKRWI, and to amend and improve confidence in the data. We have used data from the UKRWI related to waste on consignor sites, including waste volumes, radionuclide activities, information relating to the physical and chemical composition of waste, the timing of arisings, packaging plans and different waste treatment and disposal routes. We process the data to more accurately reflect the expected waste composition at the time of disposal.

The Reference Inventory has been produced over three stages, with the final Reference Inventory being the output of Stage 3. At each stage, we have developed the inventory through iteration with the ESC assessments because the assessments set constraints on the types of waste that can be accepted for disposal. The Stage 1 Inventory was used in the Phase 1 assessments. The Stage 2 inventory was used in the Phase 2 assessments. The Stage 3 Inventory was used, as described in the Implementation L2 report, when considering the practical approach to setting capacities. This progressive approach allowed us to identify and exclude problematic waste streams (such as those containing high levels of Ra-226 or Nb-94, which, disproportionately impact our gas and coastal erosion pathways, respectively) whilst improving the definition of radiological capacities and waste stream constraints.

This report documents the data associated with the Stage 3 Reference Inventory. The inventory derived at Stage 2 is detailed in the *Stage 2 Reference Inventory: Key Assumptions and Results* report.

The Reference Forward Inventory includes all LLW that is expected to arise within the UK that will not be consigned to a suitably permitted landfill site, to Dounreay’s LLW disposal facility or to an incineration facility. This includes LLW that will be directly disposed and LLW that is subject to supercompaction or metallic treatment, noting that these treatment routes sometimes result in processed wastes being received at the LLWR. The LLW Forward Inventory includes some waste streams associated with new nuclear power stations and decay-stored streams that have been identified as being suitable for disposal at the LLWR. We also include several "opportunity wastes" in the LLW Forward Inventory; these are streams that have an alternative baseline management route in the UKRWI that would mean some portion of the waste stream is planned to be disposed of to the LLWR.

We have selected ILW streams for inclusion in the Reference Forward Inventory by screening them against radiological constraints and capacities, calculated on the basis of environmental and nuclear safety criteria. The radiological constraints are specified in terms of specific activity and the activity within a disposal package, whereas the radiological capacities are specified in terms of total activities that the repository may be able to accept. The Reference Inventory contains some information on non-radiological contaminants based on data reported in the disposal documentation and the UKRWI.

A total processed waste volume of 815,000 m^3 (excluding cover material) has been disposed to the trenches. The processed volume of waste disposed to the vaults as of 31st March 2022 was 95,400 m^3, excluding the grout and the ISO containers themselves. A further 160,000 m^3 of LLW is expected to be disposed to the vaults in future, again excluding the grout and ISO containers themselves. We anticipate a total processed waste volume upon site closure of 1,070,000 m^3, filling up to Vault 10 and partially filling Vault 11. If ILW was accepted for disposal, a further 27,100 m^3 processed waste could be disposed to the vaults, again excluding the grout and ILW containers themselves. Disposal of ILW would bring the total processed waste volume upon closure to 1,100,000 m^3, filling up to Vault 11 and partially filling Vault 12.

A total of 565 TBq of activity has been disposed to the trenches, a further 122 TBq had been disposed to the vaults as of 31st March 2022, and a further 1,820 TBq of LLW is expected to be disposed to the vaults after this date. Thus, a total inventory of 2,510 TBq is anticipated to be disposed to the LLWR, although this value does not account for any radioactive decay after the point of disposal. If ILW was accepted for disposal, a further 15,000 TBq could be disposed to the vaults bringing the total inventory plus ILW disposals to 17,600 TBq.

The Reference Inventory is subject to uncertainty, not least due to current uncertainties in the quantity and radioactivity of wastes on consignor sites and uncertainty related to future strategic, regulatory and legislative changes. Some aspects of the Reference Inventory can be judged to have a higher degree of uncertainty than others. Data on disposed wastes have been collected over several decades, with the quantity and extent of that data improving with time. As such, there is a greater level of confidence associated with data for more recent consignments. The actual forward inventory will differ from the Reference Forward Inventory, due to uncertainties in the UKRWI and our processing assumptions.

The inclusion of waste in the Reference Forward Inventory does not imply that it can or should be accepted at the LLWR. All waste would be assessed against the Waste Acceptance Criteria (WAC) and there will be consideration of whether disposal at the LLWR is consistent with Best Available Techniques. The robust implementation of WAC will ensure that only wastes that are consistent with the specified radiological and non-radiological criteria are disposed of.

We will monitor the nature of disposals to ensure that they do not diverge significantly from the assumptions in the Reference Inventory. We will also keep the inventory under active review, such as by undertaking analysis of future iterations of the UKRWI.

Since the 2011 ESC submission, the management of waste within the UK nuclear industry has been revolutionised through the application of the waste hierarchy, with the majority of LLW now being disposed to suitable landfill facilities, incinerated or recycled. It has become more evident that consignors are increasingly making use of the range of disposal routes available and only consigning wastes to the repository that require the level of protection that the LLWR offers. Consequently, the Reference Inventory presented in this document reflects the latest waste management practice and strategy, and accounts for updated programmes associated with new nuclear build. We expect to receive decreased volumes of LLW compared with the 2011 ESC, but similar levels of total radioactivity, mainly due to LLW being segregated from Higher Activity Wastes that were originally destined for disposal at the Geological Disposal Facility.

We have improved volume estimates to better calculate vault fill dates, together with enhancing data on the activities of potentially important radionuclides, and gained more detailed information on material composition, including non-radiological contaminants. This makes the inventory is more fit for purpose to support the assessments and engineering design for both past and future wastes. The inventory illustrates our best understanding of the waste to be consigned to the LLWR.

Table of Contents

1 Introduction

1.1 Objectives

This report provides an overview of the inventory of wastes that has been disposed, and a projection of wastes that may be disposed in the future, to the Low Level Waste Repository (LLWR).

The Reference Inventory is a key data input for the assessments supporting the 2026 Environmental Safety Case (ESC), in particular the assessments that are detailed in the:

- '*Environmental Safety During the Period of Authorisation*' report [13];
- '*Assessment of Long-term Radiological Impacts*' report [14];
- '*Assessment of Impacts on Non-human Biota*' report [16]; and
- '*Hydrogeological Risk Assessment*' report [15].

The Reference Inventory has also provided input to the '*Engineering Design*' report [4] and the '*Optimisation and Site Development Plan*' report [9], and complements the '*Site History and Description*' report [3], where further details on the history of disposals can be found. The objective of this report is to describe the inventory, demonstrate that there is a good understanding of the inventory and the uncertainties therein, and that the inventory is fit for the purpose for which it is being used.

The *'Guidance on the Requirements for Authorisation'* (GRA) [19] makes clear that inventory data are an important underpinning for the ESC. For example, inventory data are relevant to paragraphs 6.3.49, 7.2.1(a) and 7.2.6(b) either directly or by contributing data to be used in assessments. The full list of GRA requirements and how they are addressed in this ESC are given in our '*Addressing Regulatory Requirements and Feedback*' report [18].

The 2026 ESC also serves as a Site-wide Environmental Safety Case (SWESC) that meets the requirements of the environment agencies' *'Guidance on Requirements for Release from Radioactive Substances Regulation'* (GRR) [20]. Reference [18] explains how the GRR requirements are met, but these are not directly relevant to the disposal inventory detailed in this report.

1.2 Scope

This report presents a summary of the Reference Inventory developed for the LLWR, in terms of its material composition, radionuclide content, and content of non-radiological contaminants. The Reference Inventory is our best estimate projection of the Low Level Waste (LLW) to be disposed of at the LLWR. It also includes an estimate of Intermediate Level Waste (ILW) that might be accepted if a decision is taken to accept ILW for disposal at the LLWR. The Reference Inventory takes into account:

- the history of LLW waste disposals at LLWR, and the approaches adopted for disposal in the past;
- a projected forward vault inventory developed from the 2022 UK Radioactive Waste Inventory (UKRWI) [21], bounded by provisional constraints derived from the ESC and assumptions on waste treatment and diversion;
- the UK policy framework for managing radioactive substances and nuclear decommissioning, including the potential for disposal of less-hazardous ILW at the LLWR [22].

The Reference Inventory builds on the outcomes of several programmes of inventory development work undertaken in support of the 2026 ESC.

- We have derived the inventory already disposed to the trenches and to the vaults [23, 24].
- We have evaluated the base data from which the projected forward inventory is derived [25].
- We have generated forward inventories for the facility based on the information in the 2022 UKRWI for waste arisings, routing and processing, including opportunities for alternative routings with high confidence levels. We have made assumptions about how the wastes will be packaged [25, 26].

The Reference Inventory has been produced over three stages, with the final Reference Inventory being the output of Stage 3, presented in this report. At each stage, we have developed the inventory through iteration with the ESC assessments because the assessments set constraints on the types of waste that can be accepted for disposal. The Stage 1 Inventory was used in the Phase 1 assessments. The Stage 2 inventory was used in the Phase 2 assessments and is detailed in reference [25]. The Stage 3 Inventory, as detailed in this report, has been used to test the viability and practicality of the proposed capacities and emplacement criteria, which we document in the '*Implementation*' report [17].

More detailed summaries of the methodologies for deriving the trench, disposed vault, and forward vault inventories have been prepared [23, 24, 25].

1.3 Structure

The structure of this report is as follows.

- Section 2 provides background on disposals to the LLWR, government policy and projected future disposals. We summarise how capacity at the site is currently managed, such that any projected future wastes will be assessed on a case-by-case basis for acceptance. We also outline the changes to the development of the Reference Inventory since the 2011 ESC.

- Sections 3, 4 and 5 summarise the methods used to develop the trench inventory, the disposed vault inventory, and the forward vault inventory, respectively. Key inventory information is presented, and associated uncertainties are discussed.
- Section 6 summarises the Stage 3 Reference Inventory; the total site inventory combining the trench, disposed vault, and forward vault data. Uncertainties associated with the Reference Inventory are discussed. A comparison with the inventory that informed the 2011 ESC is given, identifying and explaining differences in the current Reference Inventory due to the improvements in data collection and derivation.

Full details of the Stage 3 Reference Inventory are given in appendices A1 to A7 for the LLW only inventory. The data for the LLW plus ILW inventory is detailed in appendices B1 to B7. A list of abbreviations used in the report is given on Page 18, and a list of terminology relevant to this report is given in Subsection 2.4.5. A general glossary of the ESC is appended to the '*Main Report*' [1].

2 Background

2.1 Radioactive Waste Classification

In the UK, solid radioactive wastes are defined according to three main categories: LLW, ILW and High Level Wastes (HLW) [22]. There is also a sub-category of LLW, Very Low Level Wastes (VLLW). Prior to 2011, most LLW in the UK was disposed of at the LLWR. Since 2011, there has been a significant increase in diversion of LLW to other routes including treatment, re-use, and disposal to permitted landfill facilities. The remaining LLW is disposed of at the LLWR. During the development of the 2026 ESC, we have assessed the ability of the facility to also accept less-hazardous ILW for disposal to inform consideration of this option by the Nuclear Decommissioning Authority (NDA) and other stakeholders, in line with new government policy.

The majority of UK LLW and ILW (by volume) arises at nuclear sites that are undertaking, or have previously undertaken, the following activities:

- fuel fabrication and uranium enrichment;
- nuclear power generation;
- spent fuel reprocessing; decommissioning;
- nuclear energy research and development;
- Ministry of Defence activities;
- manufacture of radioactive medical products; and
- waste treatment facilities.

LLW can be sub-divided into operational and decommissioning-related wastes. Operational LLW typically arises from routine monitoring and maintenance activities, and includes plastic, paper, tissue, clothing, wood and metallic items. Decommissioning LLW mostly comprises building rubble, soil and various metal plant, equipment and items.

The major components of ILW in the UK are steels, graphite, concrete, cement and sand, sludges, ion exchange resins and flocculants. Some ILW will not be suitable for near-surface disposal and will require disposal in a Geological Disposal Facility (GDF). Any LLW or ILW considered for disposal at the LLWR would be assessed against waste acceptance criteria (WAC) in place at the time to determine if it could be accepted.

2.2 Government Policy and NDA Strategy

In May 2024, the UK government and devolved administrations published a new policy framework for managing radioactive substances and nuclear decommissioning [22]. Under the new policy, those responsible for creating and managing radioactive waste should take a ‘risk-informed’ approach to decision-making, throughout the full waste management lifecycle, including disposal. The best practicable use of resources should be made, by disposing of radioactive waste to facilities designed to provide the isolation and containment appropriate to the risk posed by that waste. The UK government and devolved administrations are considering allowing some less-hazardous ILW to be disposed of in near-surface facilities, such as the LLWR. This approach aims to make the best use of available disposal capacity across the UK.

The Reference Inventory also includes an estimate of the quantities of ILW that might be accepted if a decision is taken to accept ILW for disposal at the LLWR. This has been included to enable us to assess the potential impacts of disposal of ILW at the LLWR and thus inform consideration of adopting the option to dispose of a broader range of waste.

2.3 Overview of the Site

This subsection presents a summary of the history and characteristics of the site that are of relevance for the inventory. More detailed information on the site and its characteristics is presented in reference [3].

The LLWR receives wastes from a range of consignors including the nuclear industry, defence establishments, general industry, hospitals, universities and other research establishments, and from the clean-up of historically contaminated sites.

Radioactive waste disposal operations began in 1959, and until 1988, all disposals were by tumble tipping of drummed, bagged and loose wastes into trenches. The trenches were in operation until 1995, but from 1987 disposal operations were upgraded with the aim of making more efficient use of space and improving the visual impact. Remedial work was carried out on the trenches and an engineered, concrete disposal vault was constructed, Vault 8, which allowed the orderly emplacement of containerised waste within a concrete structure according to modern disposal standards. Vault 8 commenced operations in May 1988 [3]. Construction of Vault 9 commenced in September 2008 and was completed in December 2010. Future vaults are planned and will use a further enhanced design [3], which will allow storage and disposal operations to continue at the LLWR site to around 2135.

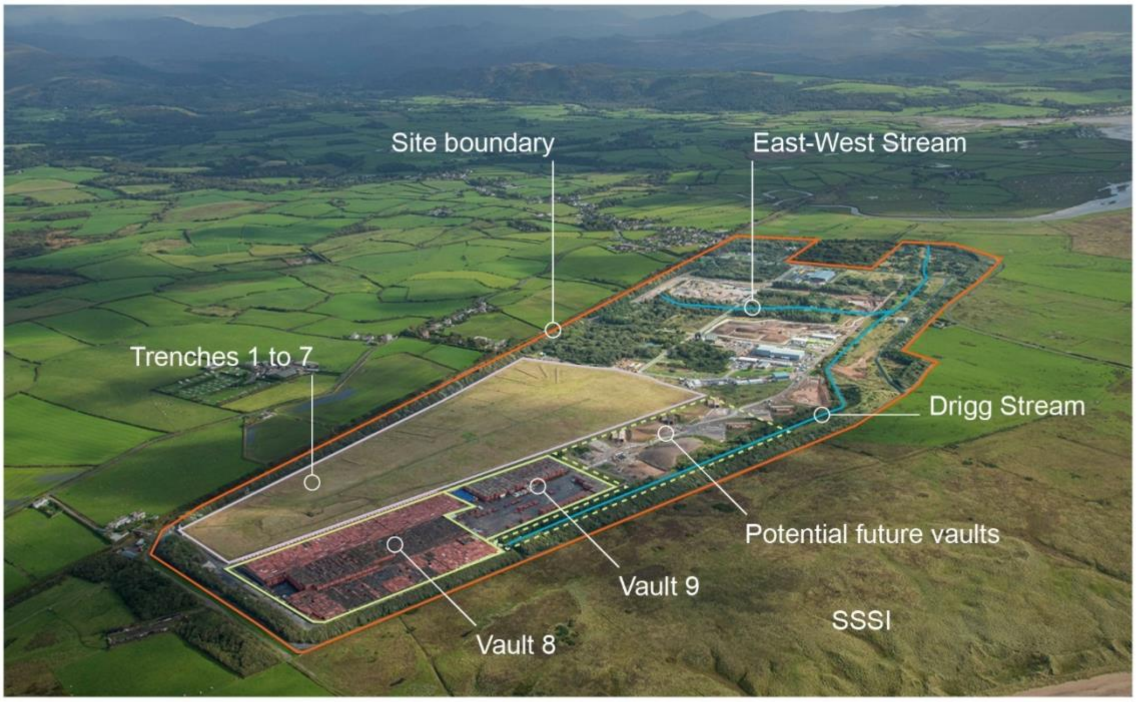


Figure 2.1: Site layout

Figure 2.1 shows the north-western quadrant of the LLWR site looking south. Vault 8 is in the foreground, with Vault 9 beyond and the temporary cap covering the trench area is to the left of picture.

2.3.1 Future Development of the Site

The vaults and trenches will be closed in sequence from north to south with a unified multi-layered barrier system, comprising a single dome final cap. This will be constructed in strips across each vault and the adjacent area of trenches. A temporary seal will be constructed at the leading edge of the cap after each strip is emplaced. The seal will create pseudo-closure conditions within the closed sections of the vaults and the trenches, protecting the containers from the environment and reducing infiltration.

On the basis of the updated understanding of container performance arising from the Vault 8 closure optimisation process, existing containers in Vault 8 and Vault 9, and wastes to be disposed of in Vault 9 and 9a already committed to the current container design, will be surcharged prior to completion of the cap over relevant wastes. This is to express container deformation and associated accessible voidage prior to cap placement, to ensure a stable formation for placement of the cap.

Strengthened ISO containers will be used for future LLW disposals to provide support to the cap and remove the need for surcharge. Container Protection Units (CPUs) will be placed on the top of stacks to protect against damage to the lids during and after closure.

If a decision was taken to enable ILW to be disposed of at the LLWR, we assume all ILW would also be packaged in strengthened containers. For the purposes of the 2026 ESC, we assume that ILW would be packaged in small mild steel containers compatible with Standard Waste Transport Containers (SWTCs) for compliance with transport safety case requirements. Two populations of ILW are considered in the ESC:

- ILW that can be managed as LLW (i.e. not requiring any additional measures such as management of external irradiation dose), which would be disposed of alongside LLW in the open vault;
- ILW that requires additional measures (e.g. external irradiation dose management), which would be disposed of in shielded modules, consisting of reinforced concrete corridors including roofs, to manage doses during the operational phase.

The wastes to be emplaced in Vault 9 and 9a, and future vaults, and the timescales over which each vault is to be filled, are uncertain (see Subsection 5.5). This is because the characteristics of wastes consigned to the LLWR are dependent on the wider radioactive waste management context in the UK. In addition, more ILW may be suitable for disposal at the LLWR than could be accommodated within radiological capacities. If a decision was taken to enable ILW to be disposed of at the LLWR, a strategy for allocation of capacity would be required to ensure optimal use of the LLWR site [17].

If disposal of ILW is taken forward, there will be different approaches to different future waste populations (see Subsection 5.2). In that situation, a modular approach will be adopted for future vaults, with different areas of the vaults being used for different purposes. Bunds or drains between modules may be constructed to manage leachate. Interim protection warehouses will be constructed in Vault 10 onwards for future containers in Vault 9 and 9a onwards. These will receive and protect containers from the weather prior to them being moved to final disposal positions.

The approach to site closure and active institutional control, including details of the optimisation approach applied to the closure engineering, is presented in reference [9].

2.4 Approach to Development of the Reference Inventory

The Reference Inventory is our best estimate projection of the LLW to be disposed of at the LLWR. It also includes an estimate of ILW that might be accepted if a decision is taken to accept ILW for disposal at the LLWR. The Reference Inventory consists of:

- the disposed inventories of the trenches and Vaults 8 and 9;[2]
- a projected forward vault inventory developed from the UKRWI, bounded by provisional constraints derived from the ESC and assumptions on waste treatment and diversion.

The inventory disposed to the trenches and the vaults up to 31st March 2022 are collectively referred to as the Disposed Inventory. The projected forward vault inventory is referred to as

[2] In this context, 'disposed' is taken to include all wastes that have been accepted with the intention to dispose, irrespective of whether they are currently disposed or 'stored' (i.e. not in their final disposal location).

the Reference Forward Inventory. The Disposed Inventory and the Reference Forward Inventory form the Reference Inventory used in the ESC.

The Reference Inventory provides a suitable basis upon which to analyse the performance of the repository within the ESC. The actual forward inventory will differ, due to uncertainties in the UKRWI and our processing assumptions. The inclusion of waste in the Reference Inventory does not imply that it can or should be accepted at the LLWR; all waste would be assessed against the WAC as part of the waste acceptance procedure, including whether disposal at the LLWR is determined as Best Available Technique (BAT). In deriving the Reference Inventory, we have generally made optimistic assumptions as to whether a given waste would be acceptable in order to ensure that the associated analysis of repository performance is cautious.

We will monitor the nature of disposals to ensure that they do not diverge significantly from the assumptions in the Reference Inventory. We will also keep the inventory under active review, such as by undertaking analysis of future iterations of the UKRWI.

2.4.1 Disposed Trench and Vault Inventory

The disposal data available for the trenches are limited due to the data requirements in place at the time. The data recorded for wastes in Trenches 1 to 6 are largely a record of volumes and disposal dates. To produce an inventory for the waste in the trenches, we have used the available data from the disposal records in conjunction with a method to derive radionuclide and material information (See Subsection 3.1).

We have also conducted a series of interviews with individuals who had operational experience of waste disposals to the trenches to extract any key tacit knowledge to support our understanding of the trench inventory and the practices in place for its disposal. Such individuals worked at the repository site or at Sellafield Ltd. These 'RECALL' interviews identified that some past practices may not have been fully accounted for in the LLWR's estimated inventory; however, we concluded that the impact of any departures from accepted practice would be bounded by the uncertainties with the current trench inventory.

Disposal data for the vaults vary in quality and extent as a result of continuous improvements in recording since vault operations began in 1988. Such improvements coincide with updates to the Waste Tracking System (WTS) and updates to information collected from consignors on Waste Consignment Information (WCI) forms.

The current version of WTS software is known as ‘eMWaste’. eMWaste is designed to support the implementation of the capacity management system and the waste emplacement strategy. eMWaste came into full operational use from 1st April 2018, superseding an earlier version of the WTS, known as the Low Level Waste Tracking System (LLWTS).

In developing the disposed vault inventory, we have addressed the data gaps in earlier disposals by applying fingerprints of analogous wastes to the disposed waste consignments, as we have done for the trench inventory. This approach was used to produce a best estimate of the radionuclide and material content of the disposed wastes. Whilst 90% of radionuclide data in Vault 8 and all radionuclide data for Vault 9 are as reported, fingerprints have been used on the majority of the materials derivation in Vault 8 and some of the waste in Vault 9. The continued improvements to the WCI form have allowed us to use reported data for more recent consignments rather than estimated data based upon derived fingerprints.

2.4.2 Reference Forward Inventory

The source data for the Reference Forward Inventory presented in this report is the 2022 UKRWI. The UKRWI is a comprehensive inventory of the radioactive waste in the UK compiled every three years. The UKRWI details both operational and decommissioning wastes from the nuclear power industry, and smaller volumes from defence activities, research establishments and medical and industrial users.

Radioactive waste is divided into waste streams to enable effective characterisation and allow the most appropriate disposal and treatment routes to be applied to a group of wastes. These waste streams also form the basis of the Reference Forward Inventory. A waste stream includes waste or a collection of waste items at a particular site, usually from a particular facility or process. Information is provided for each waste stream on waste volumes, radionuclide content, physical and chemical composition, and anticipated treatment and disposal routes.

Waste streams can be split into sub-streams according to their treatment route and package type as reported in the 2022 UKRWI. The projected waste volumes to be disposed of at the LLWR are calculated by applying volume and activity reduction factors based on the treatment routes.

In some cases, splitting a waste stream may result in sub-streams that have a different waste classification compared with the parent waste stream. For example, sub-streams of ILW streams listed in the 2022 UKRWI that are expected to be able to be managed as LLW, either now or after a period of decay storage. For the Reference Inventory, we have reclassified these sub-streams as LLW.

The derivation of the Reference Forward Inventory for the vaults considers five different treatment routes for LLW:

- direct LLW disposal, often termed simply 'LLW disposal';
- supercompaction;
- metallic treatment;
- incineration with secondary waste disposal to suitably permitted landfills;
- direct disposal to suitably permitted landfills, often termed simply 'VLLW disposal'.

Three of these routes lead to waste being disposed of at the LLWR, either directly as raw waste (routes 1 and 2) or indirectly as a secondary waste (route 3), while the other two routes result in no secondary waste arisings to the LLWR (routes 4 and 5).

The volume that waste could eventually occupy in the LLWR is then calculated based on the expected processed waste volumes and packing fractions, which account for both the packing efficiency of wastes in the disposal container and of containers within the vaults. The timing of these waste arisings and the available vault volumes are then used to determine the first and final years of disposal to each vault. Assuming that the year of arising is also the year of disposal, annual volume and radionuclide inventories for each year are also calculated, as is the anticipated disposed activity within each vault and for the entire repository.

We have also considered the inclusion of ILW for disposal in order to understand the types and quantities of ILW that could be safely disposed at the LLWR.

2.4.3 Inventory Development Stages

We have developed the inventory in three stages, namely Stages 1 through 3.

The disposal inventory is constrained by radiological capacities and constraints on individual waste streams derived from the assessments in the ESC (see Subsection 5.3.3). These assessments have been progressively developed in phases. As we develop the assessments, we learn more about the radiological constraints and controls that we should apply to the inventory. We have therefore developed these inventories through iteration with the assessments. The Stage 1 Inventory was used in the Phase 1 assessments. The Stage 2 inventory has been used in the Phase 2 assessments. The Stage 3 Inventory was used, as described in the '*Implementation*' report, when considering the practical approach to setting capacities [17]. The inventory will continue to be developed after the ESC submission as new information becomes available, such as new versions of the UKRWI.

As we develop the assessments, we learn more about the radiological constraints that we should apply to the inventory. We have therefore developed our inventories through iteration with the assessments.

- Stage 1: ILW inventory developed using constraints derived from work carried out to support NDA strategy.
- Stage 2: ILW inventory developed with constraints as per Stage 1, but with targeted improvements arising from early learning in Phase 1 assessments. This included the removal of problematic streams contributing to high doses, the application of simplified packaging assumptions, and the inclusion of opportunity waste streams as specified in the UKRWI.
- Stage 3: As Stage 2 inventory development but ILW inventory developed using updated constraints that were generally derived from Phase 1 assessments, cross-checked with early learning from Phase 2 assessments. Based on further learning from the assessments, additional problematic streams contributing to high doses were excluded. Processing factors for larger waste streams were also refined to better reflect the volumes and waste materials expected to be disposed of to the repository.

This report documents the data associated with the Stage 3 inventory. The inventory derived at Stage 2 is detailed in reference [26]. Underlying assumptions are discussed in more detail in the '*Forward Inventory Methodology*' report [25].

Each phase of assessment is based on improvements to the data used in assessments and the models themselves. As a result of these improvements there are changes to the radiological capacities and stream constraints that are calculated as an output of each assessment. However, for the cases considered, it is important to note that the radiological capacities are generally independent of the input inventory.

As a result of this process, we have gradually improved our estimate of the forward inventory.

We have adopted this iterative approach for two reasons:

- it enables us to draw on the results of assessment calculations to identify any wastes for which disposal is problematic;
- assessment calculations had to be undertaken before the final Stage 3 inventory was available.

The assessments reported as part of this ESC are the Phase 2 assessments. As noted above these are based on the Stage 2 Inventory. The Stage 3 Inventory has been used to test the viability and practicality of the proposed capacities and emplacement criteria, documented in the '*Implementation*' report [17].

2.4.4 Capacity Management

Under UK policy [22], those responsible for creating and managing radioactive waste should take a ‘risk-informed’ approach to decision-making, throughout the full waste management lifecycle, including disposal.

Controls need to be implemented to ensure safe use of the facility, including WAC, waste package emplacement strategies, and setting total maximum capacities for some radionuclides and other materials. The controls are primarily based on environmental and operational safety considerations, to ensure that impacts remain consistent with regulatory requirements both during and after the facility's operational lifetime.

To develop a Reference Inventory that demonstrates the optimal use of the LLWR, the assessed impacts have been used to determine preliminary limits (‘constraints’) on the activity concentrations of waste and the total activity of waste that could be accepted, while ensuring that radiological impacts from the repository are consistent with relevant regulations and guidance that apply to the disposal of radioactive waste at the LLWR site.

The constraints used to derive the Reference Inventory were based on the results of the Phase 1 assessment calculations, cross-checked with early learning from Phase 2 assessments. The final position on the constraints is set out in the '*Implementation*' report [17] and does not directly correspond to the set of constraints used for the derivation of the inventory. This is because several considerations are important before a final view on radiological capacities and stream constraints is set out, including the following.

- A view must be reached on the extent of caution that is appropriate.
- It might be appropriate to make sure that the constraints are sufficiently simple to be understood and applied.
- They must be practically implementable (particularly relevant if emplacement strategies are under consideration).
- We may need to consider any issues arising because the impacts from some exposure pathways might be additive.
- Some impacts might be managed by means other than management by capacity or emplacement strategies, e.g. through design changes.

2.4.5 Inventory Terminology

We use several 'waste volume' terms in this report. These represent the volumes of the waste at different stages of the waste management lifecycle. These terms are defined, together with other important terms used in the report, in Table 2.1.

Table 2.1: Terminology

Term	Definition and discussion
Reference Inventory	The Reference Inventory consists of the known disposed inventories of the trenches and Vault 8, the waste currently accepted for disposal in Vault 9, and a forward vault inventory developed from the 2022 UKRWI. The Reference Inventory is intended to provide a best estimate on the volume of LLW and, if a decision is taken to accept ILW, an estimate of the volume of ILW that might be suitable for disposal at the LLWR within the site constraints. The actual site inventory will depend on assessments against the WAC during the waste acceptance procedure.
Waste stream	Radioactive waste is divided into waste streams to enable effective characterisation, and to allow the most appropriate disposal and treatment routes to be applied to a group of wastes. These waste streams form the basis of the Reference Forward Inventory. A waste stream includes waste or a collection of waste items at a particular site, usually from a particular facility or process.

Term	Definition and discussion
Waste sub-stream (sub-stream)	For some waste streams, we have applied a further division to allow the production of derived inventories. Sub-streams are derived by considering the routing and package types associated with a waste stream, whether the waste stream has stock and arisings components in the UKRWI, and the timing of arising of the waste (see Subsection 5.3.2 for further details).
Raw waste volume	This is the volume actually occupied by wastes on the sites from which they originate, for example in the tanks, vaults, silos or drums in which they are contained. Most wastes are untreated or partly treated, but some are already processed or conditioned for disposal. The raw waste volume is normally the ‘reported volume’ in the UKRWI.
Processed waste volume	This is the volume taken up by wastes in the final disposal container, and accounts for any treatment or processing the waste may have undergone (e.g. supercompaction or drying treatments). This volume excludes added encapsulant or final disposal container materials. For waste streams undergoing direct disposal without any treatment, the processed waste volume will be equal to the raw waste volume.
Conditioned waste volume	This is the volume taken up by wastes in the final disposal container accounting for the addition of encapsulant, but excludes the volume associated with final disposal container materials. For waste streams with a ‘/C’ suffix in the UKRWI, the conditioned waste volume will be equal to the ‘reported volume’ in the UKRWI.
Packaged waste volume	This is the volume corresponding to the external volume of the final waste package or waste packages that waste is placed in. It represents the final waste volume.
Emplaced or ‘air space’ volume occupied by waste	This volume represents the space that the final waste packages occupy in the vaults , either as a result of their shape (e.g. rectangular containers with rounded edges take up an effective rectangular volume) or emplacement requirements.

Term	Definition and discussion
Stream constraints	Constraints arising from consideration of nuclear and environmental safety and used to assess whether a waste stream or sub-stream is potentially suitable for disposal to the LLWR (subject to that waste stream or sub-stream not exceeding the total radiological capacity of the site on its own). Constraints are derived from radiological assessment calculations of the short-term and long-term performance of the repository, which have been informed by our established ESC and Nuclear Safety Case (NSC). ESC constraints are given in terms of the specific activity of packaged wastes, whereas NSC constraints are given in terms of the activity within a package. The stream constraints are used to assess all considered waste streams and sub-streams.
Radiological capacities	These are limits on the total activity from all waste that can be disposed of to the LLWR. We use several capacities, each derived from a distinct radiological assessment case. For a given assessment case, the limit for each radionuclide specifies the maximum activity of that radionuclide that could be disposed of and result in peak radiological impacts consistent with appropriate regulations or guidance. In general, we have to consider several radionuclides. If, for each radionuclide, we were to dispose of an activity equal to the calculated limit, the assessed impacts could exceed relevant regulatory criteria. To prevent this occurring, our capacities are applied using a sum-of-fractions approach (see Subsection 5.3.3 for details). We calculate a separate sum of fractions for each assessment case.

2.5 Key Areas of Improvement Since 2011

2.5.1 Approach to the Development of Inventory Cases

In the 2011 ESC, alternative inventory cases were presented to explore the potential variability in future disposals [27]. However, subsequent comparison of actual waste receipt data against UKRWI projections has shown that the assumptions underpinning those cases were subject to greater uncertainty than was recognised at the time. We now have an improved understanding of the inherent uncertainties in UKRWI data, allowing for more informed and adaptable decision making. The introduction of risk-informed ILW disposal has added a different source of uncertainty, influenced by choice of waste rather than by variability in data.

Although uncertainty within the UKRWI has been reduced through continued refinement, projections, particularly for waste arising from future facilities that have not yet been designed, remain inherently uncertain, with diminishing value expected from further case development. In light of this, our approach places greater emphasis on applying and maintaining effective safety controls, including WAC, emplacement strategies, and continuous monitoring of receipt data, to ensure consistency with ESC assumptions, rather than relying on the development and analysis of multiple inventory cases [17].

2.5.2 Improved Waste Diversion

Since the 2011 ESC, considerable strides have been made by the nuclear industry in diverting wastes away from the LLWR to preserve its capacity for wastes that require the level of protection the repository offers. Such diversion was accounted for in the 2011 ESC, but diversion routes were not in full operation at that time so the extent to which waste could be diverted away from the repository was not clear.

Now, we have over a decade of experience of the full operation of those diversion routes, which has enabled us to improve our forward inventory through better estimates of wastes that are expected to arrive at the LLWR either directly or after being routed for treatment elsewhere. Consignors are now able to predict the proportions of waste streams that will be routed down different treatment and disposal routes. Such predictions are likely more accurate for arisings in the near future, for which better characterisation data is available, and management routes are better defined, than for wastes arising further into the future, for which precise routing details may be more uncertain. Far-future inventory predictions made by waste producers are often based on analogous waste streams that are currently arising. These predictions are subject to high levels of uncertainty relating to the nature of the waste and possible future advancements in treatment technologies.

2.5.3 Tracking System Updates

The LLWTS was replaced by eMWaste on 1st April 2018. The two principal improvements made by replacing the LLWTS with eMWaste are as follows.

- The LLWTS relied largely upon a manual input of data into the system from the WCI form and the earlier D4 Disposal forms. For eMWaste, WCI forms are uploaded to the system and all data are extracted. This improvement results in the data transfer from the WCI without error and complete accessibility of the data for querying and analysis.
- The LLWTS data fields and structure were fixed and based upon historic data needs, and as the WCI form evolved to capture more detail about the waste, the LLWTS could not accept the new data (for instance, the LLWTS could accept bulk material composition data for a consignment, e.g. metal, but could not accept individual material mass data, e.g. stainless steel). For eMWaste, the system has been

designed based upon the data structure in the WCI form and the eMWaste data structure will evolve as required based on future iterations of the WCI form. This improvement results in the ability to access all data provided on the WCI form, rather than the subset that was available from the LLWTS data.

The new system also improved our ability to track the location of waste on the site and allowed us to integrate our capacity management capability.

2.5.4 Improvements in Data Collection

Between 2014 and 2016, an improved WCI form was introduced for use by waste producers, delivering substantial improvements in the recording and classification of material composition. The form included thirteen distinct material groups and detailed material information. Additionally, the form began capturing details of non-radiological contaminants, with flexibility to declare other relevant substances. From 2016 to 2018, further enhancements to the form enabled the recording of masses for all non-radiological contaminants currently requested from waste producers. Following the implementation of eMWaste on 1st April 2018, all data from the WCI form are now directly imported into the new tracking system, significantly improving access to consignment data and supporting more robust reporting to the Environment Agency and use in ESC assessments.

2.5.5 Improvements to the Disposed Inventory

The updated disposed vault inventory for the LLWR site represents a significant improvement in understanding since the version presented as part of the 2011 ESC submission.

A review of the inventory data has been performed and updates made to the derivation methodologies for the radionuclide and material data. Where available, detailed radionuclide and material breakdowns have been used as input data sources. Where detailed data are not available in the input data sources, either for grouped radionuclide activity or materials reported in groups, fingerprints are generated to provide a more detailed breakdown; this is described in reference [24]. The most specific fingerprints possible are matched to consignments, whether this be through matching a sub-stream or waste stream, matching a consignor or site or matching by industry as a last resort. These changes and improvements reflect a significant enhancement in the level of detail and the comprehensiveness of the LLWR disposed vault inventory.

We have undertaken a detailed Consignment Emplacement Assessment focused on Vault 8. This audit compared digital records from our tracking system with multiple sources, including paper maps, photographs, legacy systems, and technical reports, resulting in corrected consignment data and enhanced confidence in our derived inventory.

Most notably, we have confirmed a match between every ISO container in Vault 8 and its corresponding digital record. This achievement reflects the robustness of our data management and the integrity of our inventory tracking system.

We have reviewed the methodology used to derive the trench inventory. This included work to review the data collected as a part of the RECALL exercise, which involved interviews with current and former workers from Sellafield Ltd and the LLWR to improve the trench waste inventory. It was found that the upper uncertainty limit for the radioactivity estimates of one order of magnitude, as quoted in the 2011 ESC, remains appropriate.

2.5.6 Waste Producer Engagement and Data Enhancements

As part of work to improve the forward inventory for the LLWR, a series of programmes of collaborative work with the waste producers have been undertaken to refine and develop inventory data for the 2016 UKRWI, 2019 UKRWI and 2022 UKRWI.

The 2016 UKRWI Enhancement Project Report [28] describes the details of the initial waste producer engagement exercise. Waste streams in the 2016 UKRWI were screened for potential inconsistencies and data gaps including missing radionuclide data, anomalously high U-235 enrichment, unexpected radionuclide ratios, missing data on non-radiological contaminants, unclear or missing routing data, and anomalous waste category declarations.

Workshops and focused meetings were held with all waste producers aimed at addressing output of the screening exercise and enhancing the available inventory data at a waste stream level. Following the screening process, it was agreed with the waste producers to address waste streams in a prioritised order based on their potential impact on the volumetric, radiological and non-radiological capacities of the LLWR. These waste streams were reviewed and updated collaboratively, with agreed changes from the waste producers incorporated into the pre-populated 2019 UKRWI. As such, the results of this project improved the quality of the data reported in the 2019 UKRWI.

As part of the continuing process of development and improvement, the inventory data fields in the 2019 UKRWI were reviewed by the data providers and key inventory data users. Several additional data fields were included in the 2022 UKRWI covering information of interest for the radiological and non-radiological assessments.

3 The Trench Inventory

3.1 Derivation and Development

3.1.1 The Trench Inventory Derivation for the 2011 ESC

The disposal records for the waste disposed into the trenches vary in quantity and quality over the period of disposals. As part of previous work, we have produced an estimate of the trench inventory based, where possible, on these records but also making use of fingerprints that we consider to be similar to the disposed wastes.

The trench inventory has been presented previously in the 2000 Status Report [29] and the 2002 Post-closure Safety Case (PCSC) [30]. It was further updated to provide the best practicable estimate of the trench inventory for the 2011 ESC [31, 32, 27]. This work included retrieving information from paper-based records and consolidating data from multiple sources. A summary of the principal data sources is as follows:

- Disposal Records: This was the standard documentational requirement for disposals for the majority of the trench operating timeframe, covering Trenches 1 to 6. It provided the waste originating site and the date of disposal.
- Month-end and period-end reports, and British Nuclear Fuels Limited (BNFL) Annual Environmental Reports: These provided disposal volumes for the relevant period.
- D4 Disposal Records: These records constituted a more detailed version of the older disposal record which was used to capture data for waste disposed of in Trench 7 and was inputted into the original LLWTS. The LLWTS was introduced to begin tracking containerised waste going into Vault 8 from 1988 onwards.
- LLWTS: As well as providing D4 disposal record data for Trench 7 disposals, the LLWTS was the primary data source for developing the radionuclide and material fingerprint data for trench disposal consignments.
- Published UKRWI between 1991 and 2004: These were also used for developing the radionuclide and material fingerprint data for trench disposal consignments where the LLWTS did not contain data for the relevant consigning site.

A practicable approach using both disposal record data and derived fingerprints was taken in deriving the trench inventory, discussed in greater detail in the *'Trench Methodology'* report [23]. Consignments were split into 'Specific Consignments' and 'Routine Consignments'.

Specific Consignments were flagged as significant to the ESC due to unusual radionuclide content or unique physical properties, identified through operational insights and disposal record reviews. These included items with uranium, plutonium, thorium, waste from Springfields, waste from the magazines used to store plutonium-contaminated materials (PCM), and tritium-containing Harwell Betalights. Disposal records were analysed to extract details on volume, radionuclide and material properties; where data were missing, estimates were made based on consignor records or developed using methods applied to Routine Consignments.

Over 100,000 trench disposal records were generated during years of disposal operations, with the majority lacking detailed data on radionuclide and material properties. As a result, the remaining consignments not otherwise classified as Specific Consignments were grouped as Routine Consignments. For these Routine Consignments, the consignment volume was estimated based on consignor records. In limited cases, volume information for Routine Consignments was extracted if it was available during manual data extraction.

The radionuclide and material fingerprints for Routine Consignments were developed separately without review of the disposal records, as it was identified that many of the records would not contain specific radiological or material data, making such review ineffective. Instead, each waste's originating site was matched with existing waste stream fingerprints for wastes stored at those sites. The main source for this waste stream data was LLWTS data for Trench 7 and Vault 8 consignments. Where matching was not possible, data from the 2004 UKRWI and its earlier versions (1991, 1994, and 1998 National Inventories) were used to ensure all consigning sites had applicable waste stream data for their respective trench consignments.

The output of this work was a detailed material and radionuclide inventory of the trenches broken down by trench (see Table A.5 and Table A.1 in the Appendices).

3.1.2 Work on the Trench Inventory since the 2011 ESC

Since the 2011 ESC, we have reviewed and summarised the uncertainties associated with deriving the trench inventory [23]. Reference [23] clarifies and documents previous work undertaken to derive the inventory disposed of in the trenches.

A minor error was identified in the inventory calculations related to radionuclide data for Specific Consignments from Springfields [23]. This led to slight overestimations in the trench inventories – 0.035% for Trench 7 and less than 0.001% for Trenches 2 and 4. Given the negligible impact, the effort required to revise the data, and existing uncertainties, the inventories were not updated. The previously stated upper uncertainty limit of one order of magnitude remains appropriate.

The RECALL exercise [4] entailed a series of interviews with current and former workers from Sellafield Ltd and the LLWR. These were held between March 2008 and March 2009 in an attempt to improve the waste inventory for the trenches. A further review of the implications of the RECALL exercise has been undertaken since the 2011 ESC [33]. The subsequent review of the RECALL work focused on assessing how multiple issues collectively affect the inventory estimates for potentially important radionuclides.

The information provided by the RECALL interviews was considered, and an assessment made as to whether it might affect the trench inventory. Aspects requiring further discussion beyond that given in the original analysis were explored, including those identified in work undertaken to assess Discrete Items and Active Particles [34], and an assessment of the collective effects of multiple aspects was given. Overall, the conclusion of the original analysis of the RECALL exercise was confirmed [33]:

> '*…for all issues analysed, any impact of issues raised in the RECALL process on the current inventory of the trenches or Vault 8 is likely to be bounded by current uncertainties acknowledged in the trench or Vault 8 inventory and hence in assessments of the performance of the facility.*'

3.2 Results

3.2.1 Volume

The operational dates of the trenches are given in Figure 3.1, along with the volume of waste disposed to each trench. The total waste volume of 815,000 m^3 does not include the volume of material used to cover the waste after disposal [31].

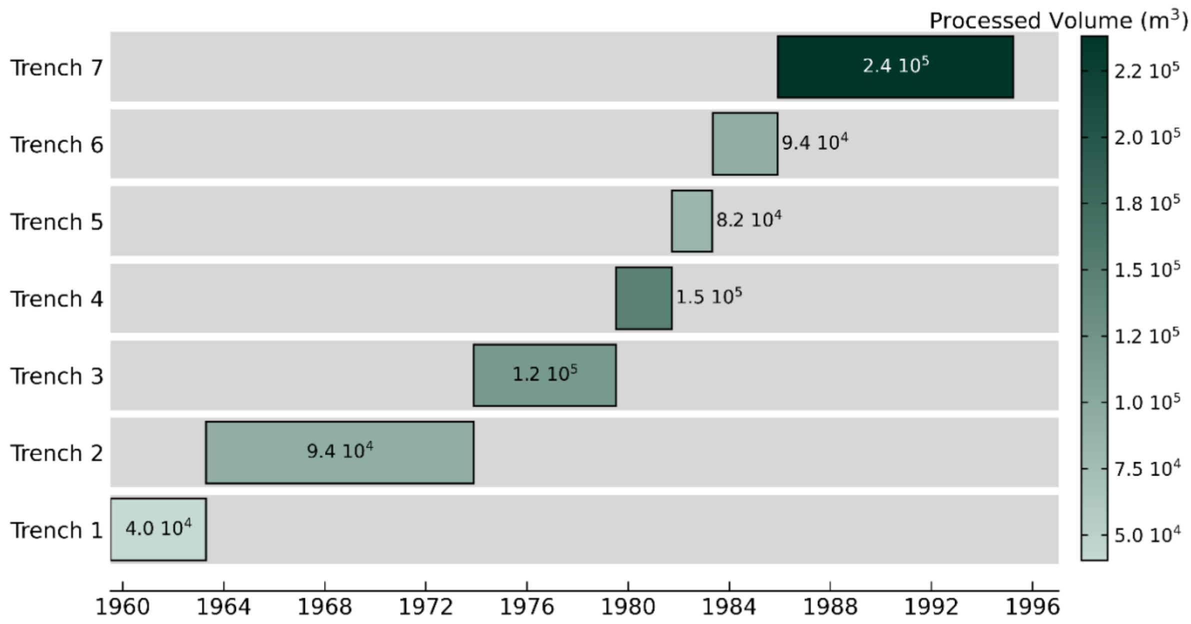


Figure 3.1: Trench operational dates and processed waste volumes. The boxes for each trench are labelled with the processed waste volume (in m^3). The colour of the box provides a visual representation of the volume using the right-hand side bar. The width of the boxes represents the operating period in line with the x-axis

3.2.2 Radioactivity

The total activity in each of the trenches is shown in Figure 3.2.

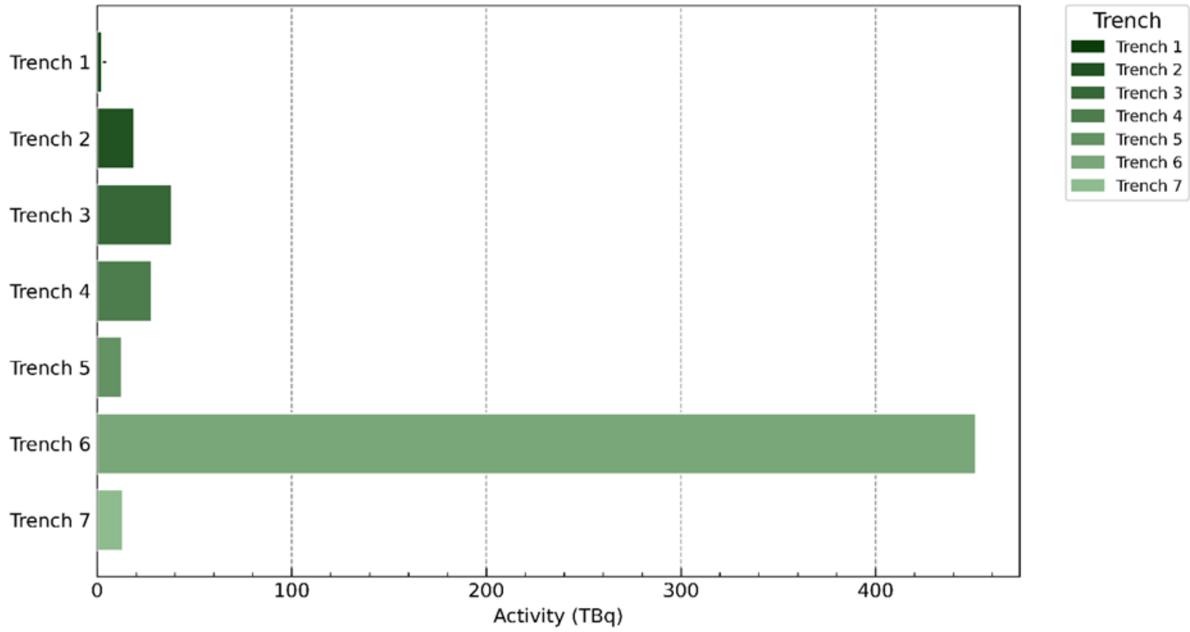


Figure 3.2: **Distribution of the radionuclide activity at the time of disposal of the derived trench inventory across the seven trenches**

Where fingerprint data were available for a consignment, they refer to the activity of radionuclides in that consignment at the date of disposal. Where no radionuclide data are available for a given consignment, fingerprint data for waste streams believed to be similar in nature were adopted. Again, these fingerprints refer to the activity of the waste stream at the time the waste arises. Thus, the activity data presented have not been decay corrected to any reference date, nor has the ingrowth of radionuclide daughters been accounted for.

The total activity of the derived trench inventory is 565 TBq. The activity of tritium dominates the trench inventory at 502 TBq of the total (89%). The majority of the tritium (447 TBq) is in Trench 6, with the source being Harwell Betalights, which were treated as Specific Consignments. As discussed above, the activities presented relate to when the waste was disposed to the trenches. For tritium, with a half-life of 12.3 years, and noting the end date for disposals in Trench 6 of 1985, the total activity will have decreased significantly from the 502 TBq presented above. Tritium is detected in analysis of leachate at monitoring locations around the LLWR site. This is discussed further in the Level 2 *'Monitoring'* report [8].

The only other radionuclides representing more than 2% of the total trench inventory are Cs-137 and Pu-241. The total trench disposed activity of Cs-137 is 16 TBq, most of which is in Trench 7. The total trench disposed activity of Pu-241 is 15 TBq, which is predominantly disposed of in Trench 2 and relates to disposals of PCM from the magazines (also treated as Specific Consignments). Both Cs-137 and Pu-241 also have short half-lives, 30 years and

14.4 years, respectively, so the activity of these radionuclides will have decreased significantly since the time of disposal.

The complete radionuclide data for the derived trench inventory are presented in Table A.1, in Appendix A1.

3.2.3 Bulk Materials

In contrast to the Disposed and Reference Forward Inventories, trench materials have been recorded as volumes and we have not converted these to masses to avoid the uncertainties that are introduced by making assumptions on densities. The total waste volume of the trenches is estimated to be 815,000 m^3. Figure **3.3** shows the percentage breakdown across the material groups for the trench inventory.

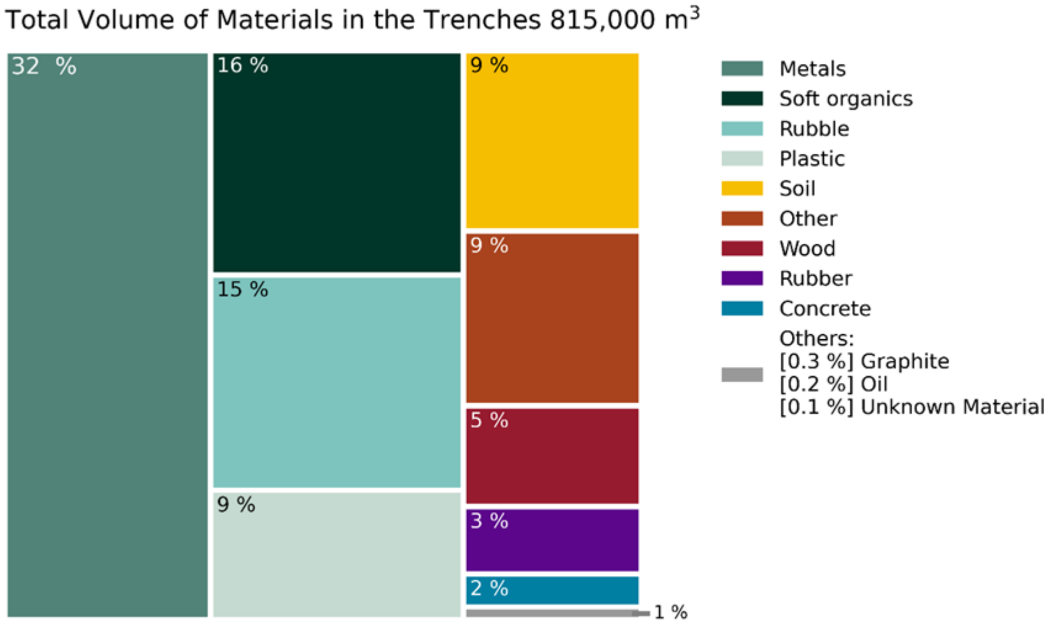


Figure 3.3: Distribution of the material volume of the trench inventory

The Metals group dominates at 32% of the total material volume. The contribution of metal from each individual trench ranges from 23% to 36% of the total material volume for the individual trenches. The complete material volume data for the trench inventory are presented in Table A.5, in Appendix A3.

3.2.4 Non-radiological Contaminants

We undertook substantial work to derive the non-radiological inventory for the 2011 ESC [27, 31, 32, 35], which remains the principal source of non-radiological inventory data. It is difficult to estimate the inventories of non-radiological contaminants because limited information was recorded at the time of trench disposals. Good estimates are only available for boron and lead.

For other contaminants, we do not have the same level of information. However, we do have a confident understanding of the bulk materials disposed of in the trenches, and we apply reasonable assumptions about the composition of those materials to derive contaminant masses. This approach is used to generate the trench inventory of non-radiological contaminants considered within the Hydrogeological Risk Assessment (HRA) [15, 36].

3.3 Uncertainty

In this subsection, we identify the different sources of uncertainty in the trench inventory.

One source of uncertainty arises from data gaps in the reported trench consignment data. Key gaps in consignment records relate to volumes, radiological fingerprints and material compositions. So, for many Routine and some Specific Consignments, it was necessary to use fingerprints and other information from waste streams that were considered to be analogous to the disposed waste streams. These analogous waste streams could be from the same facility or the same site as the disposed waste streams. Uncertainties arise because it is uncertain to what extent the selected analogous waste streams are similar to the disposed waste streams.

Another source of uncertainty relates to the uncertainty in the characterisation data for a specific waste stream. For example, an estimate of the inventory of a particular radionuclide may be based on uncertain measurements, assumptions or calculations. In general, these uncertainties are lower for those waste streams disposed of more recently.

The radioactivity results section, Subsection 3.2.2, acknowledged the short half-lives of the three most abundant radionuclides in the trench inventory, tritium, Cs-137 and Pu-241. Whilst this does not introduce further uncertainty to the trench inventory, it is worth reiterating that this does have an impact on the radionuclide composition of the inventory as reported in that section.

4 The Disposed Vault Inventory

4.1 Derivation and Development

The disposed vault inventory presented in this report consists of wastes disposed of to Vault 8 and Vault 9 up to 31st March 2022. The disposed vault inventory is based upon the inventory models presented in reference [37] for disposals up until 31st March 2018, on data from the eMWaste Tracking System for disposals between 1st April 2018 and 31st March 2022, and Waste Consignment Information for two specific waste streams (the Treated Radwaste Store (TRS) drums and decommissioning rubble from the LLWR PCM magazines, see Subsection 4.1.3). A detailed description of the methods applied, including some updates to the disposed vault inventory since reference [37] was produced, is given in reference [24]. A summary of the derivation and development is presented here.

Wastes included in the disposed inventory were suitable for disposal when assessed against the waste acceptance conditions in place at the time of waste acceptance. We intend to undertake a comparison of the updated disposed inventory against the latest version of the WAC once it is updated to reflect the findings of the 2026 ESC.

4.1.1 Disposals to 1st April 2018

For consignments received before 1st April 2018, over 90% of the radionuclide inventory is based on explicit declarations from the consignor, while only 2% of the materials data are provided against as-declared individual (i.e. not grouped) materials. The remainder of the radionuclide activity and materials mass has been derived based on fingerprint data for analogous waste streams.

The disposed vault data used in the 2011 ESC covered disposals up to 31st March 2008. Since 2008, the quality and quantity of waste consignment information have improved. We have therefore been able to use the more recent consignment data to improve the estimates of inventory associated with the older consignments. These improved techniques have been used for the derivation of inventory data for wastes disposed of up to 1st April 2018, when the eMWaste tracking system was introduced to replace the previous tracking system. More detail on the individual steps and estimation methods are provided in references [37] and [24].

We have also audited digital records against various other information sources, including paper vault maps and photographs. This has led us to correct consignment data and has improved our confidence in the disposed vault inventory.

4.1.2 Disposals from 1st April 2018 to 31st March 2022

For consignments received after 1st April 2018, we use data from the eMWaste tracking system directly as reported, as the WCI forms that they are based on provide sufficient detail to support the ESC assessments. The 1st of April 2022 was selected as the cut-off date because the Reference Forward Inventory is derived from the 2022 UKRWI, which was the most recent version of the UKRWI available at the time the Reference Forward Inventory was derived. This approach ensures that wastes in stocks and arising beyond 2022 in the UKRWI are appropriately considered.

4.1.3 TRS Drums and PCM Waste

The disposed vault inventory includes the 1,068 TRS drums disposed of in Vault 8. These drums were disposed of as reclassified LLW after being reported in the UKRWI as ILW and were disposed of between 2022 and 2024. Despite the disposed inventory cut-off date being 31st March 2022, and only a fraction of the TRS drums being received to the LLWR site before this date, the entire population of TRS drums was included in the disposed inventory as the consignment documentation for disposal to the LLWR was deemed to be a more accurate representation of the waste than the UKRWI data would have been. The associated UKRWI waste stream (5G03/C Conditioned Steam-Generating Heavy Water Reactor (SGHWR) Sludges) has been excluded in the development of the forward inventory.

The disposed vault inventory also includes decommissioning rubble from the LLWR PCM magazines that is planned to be emplaced into Vault 8 during the 2026 - 2027 financial year. Although this waste has not yet been emplaced, there is no waste stream associated with it in the 2022 UKRWI and so it has been included to give a more accurate inventory for Vault 8.

4.2 Results

4.2.1 Volumes

The packaged waste volumes of waste disposed of in Vaults 8 and 9, and the remaining airspace in Vault 9 and 9a, are presented in Figure 4.1. The total disposed vault packaged volume is approximately 234,000 m^3. The processed and conditioned waste volumes are given in Table A.4 in Appendix A2, along with the packaged waste volume.

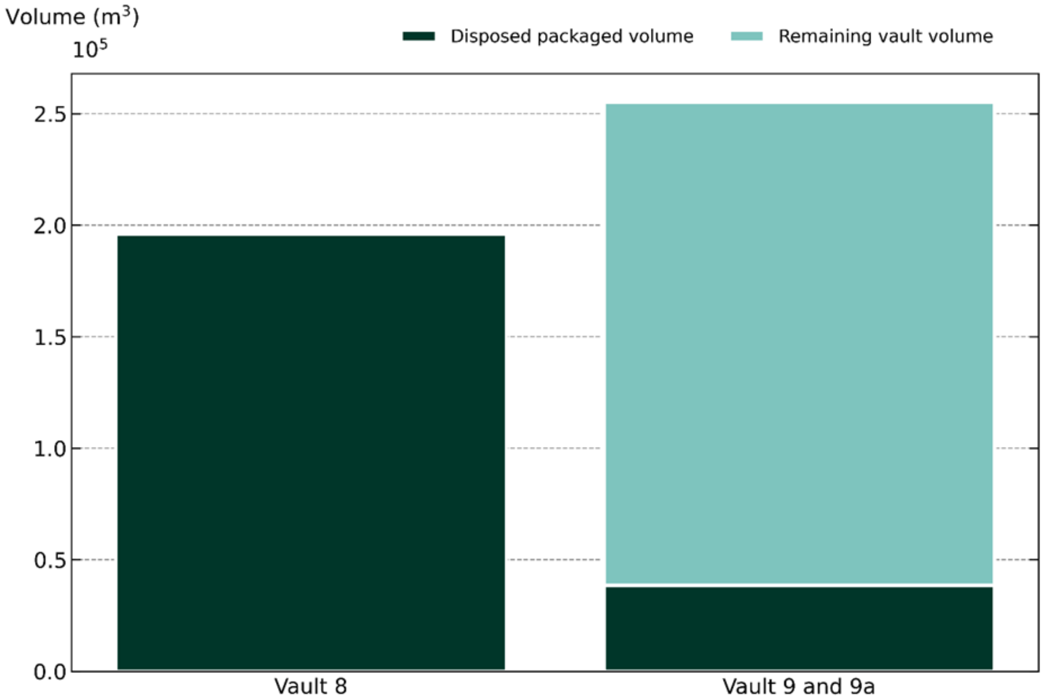


Figure 4.1: Packaged volume disposed and remaining vault volume per vault

The packaged volume per consignor for the disposed vault inventory is shown in Figure 4.2. Sellafield Ltd is the largest consignor with 57% of the waste, with Magnox consigning 19% of the packaged volume.

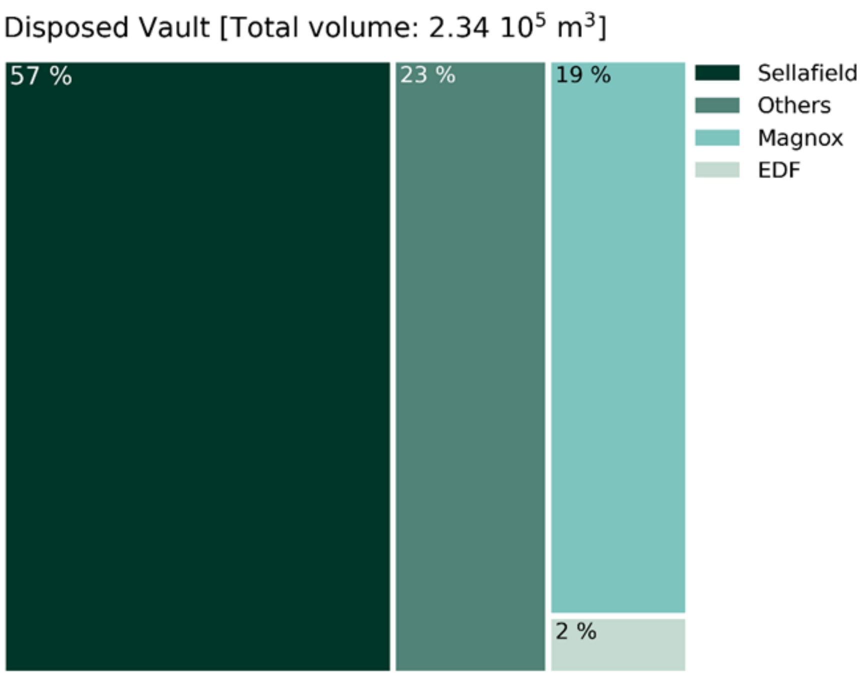


Figure 4.2: Packaged volume per consignor for the disposed vault inventory

4.2.2 Container Types

The types of containers disposed of in Vaults 8, 9 and 9a are presented in Figure 4.3. Predominantly, the vaults are filled with half-height ISO (HHISO) containers, although there are other types of ISO containers that have been disposed of historically. Most significant in this regard are the third-height ISO containers that are often used for heavier wastes (e.g. metal) to ensure that the gross mass of the ISO container does not exceed weight limits imposed by operational constraints. There is also a population of non-standard containers in Vault 8, including the TRS drums and Windscale Advanced Gas Reactor (WAGR) boxes. As consignments have become standardised to containerised wastes over time, the proportion of HHISO containers (including the variant for supercompacted waste from the Waste Monitoring and Compaction Facility (WAMAC)) is higher in Vault 9 than in Vault 8.

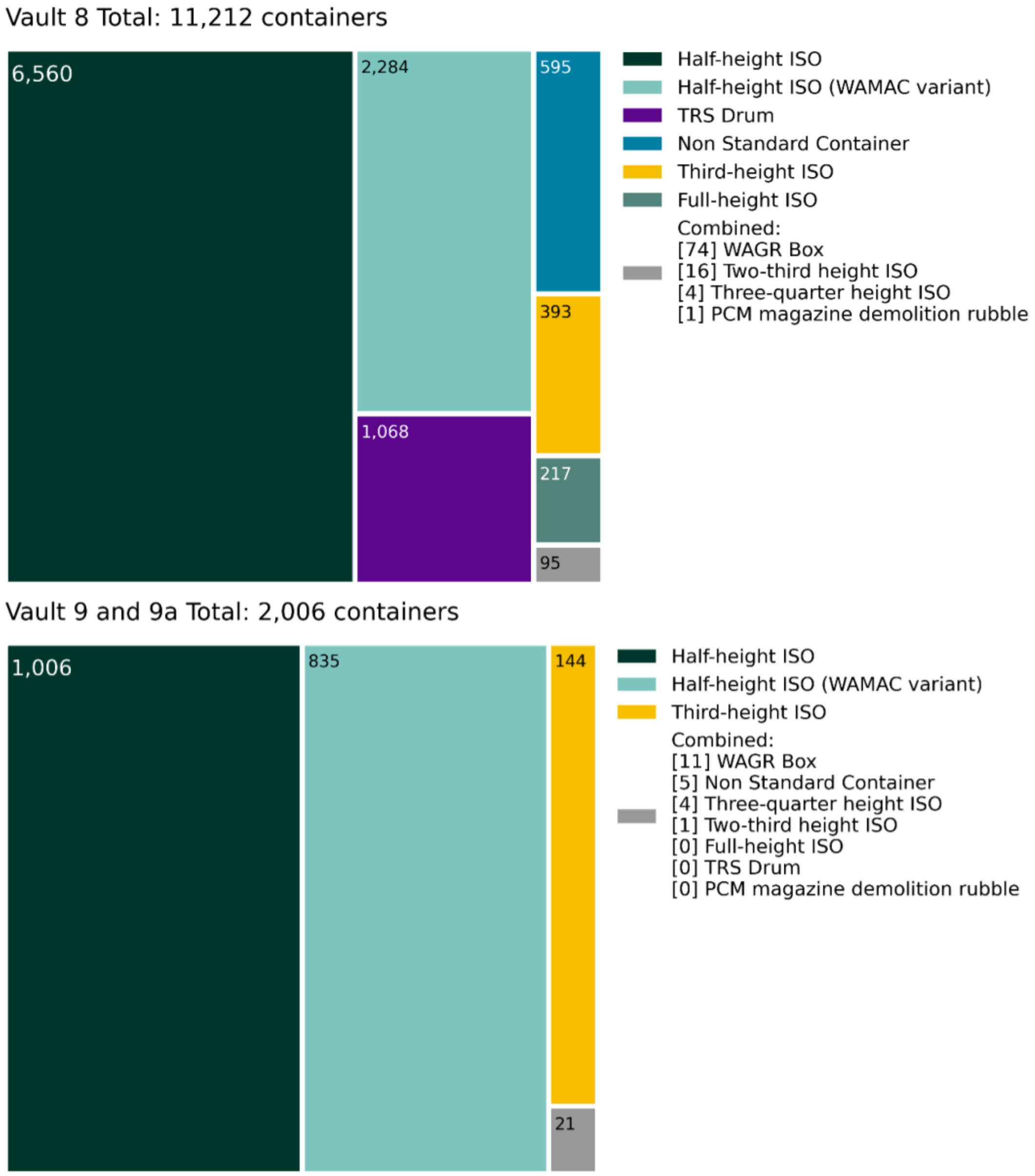


Figure 4.3: Number of disposed containers per vault

4.2.3 Radioactivity

The full list of radionuclides currently disposed in Vault 8 and 9 and their associated activities at the time of disposal are given in Table A.2 in Appendix A1. Figure 4.4 presents the total activity in each vault. The total disposed activity is 122 TBq. Currently, of this total, 101 TBq of this radioactivity is in Vault 8, and 20.5 TBq is in Vault 9.

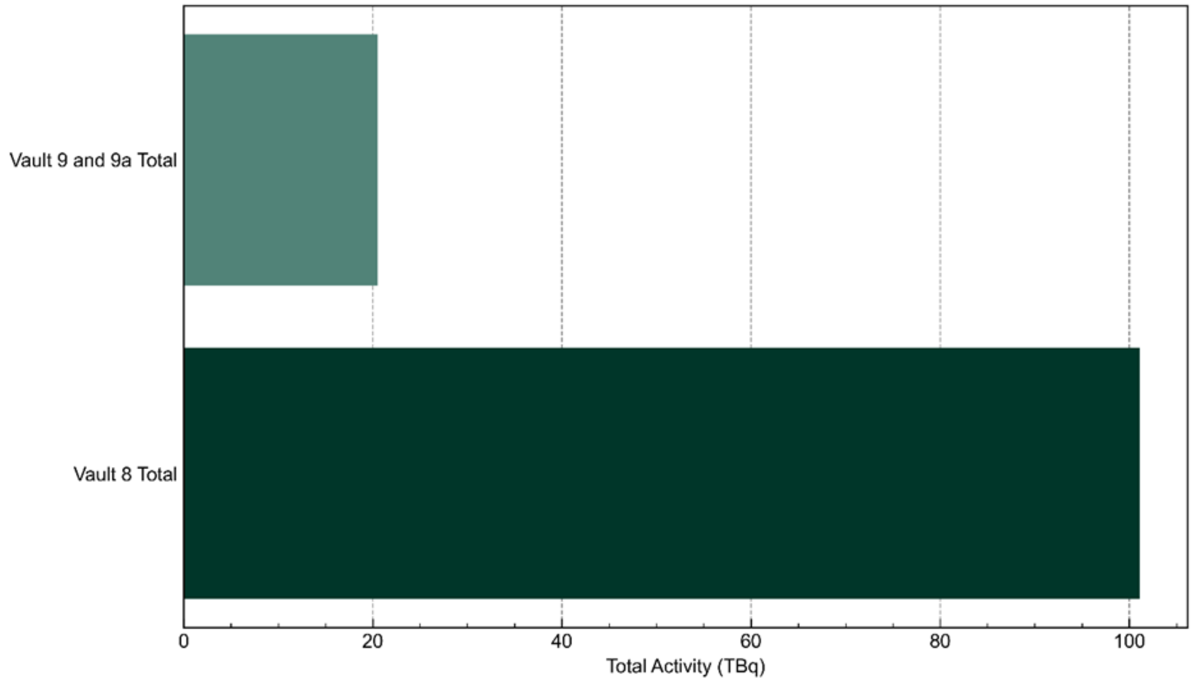


Figure 4.4: Activities of the radionuclides disposed in Vaults 8 and 9

The specific activity received in each financial year is presented in Figure 4.5, along with the number of containers received each year. There is a trend towards higher specific activities in wastes received from 2017 onwards, which coincides with a reduction in the average number of containers received. This reflects that the site has received consignments with higher activity concentrations (notable wastes are the reclassified ILW to LLW in WAGR boxes and TRS drums), whilst diversion of lower activity wastes and treatment options have resulted in lower volumes of waste.

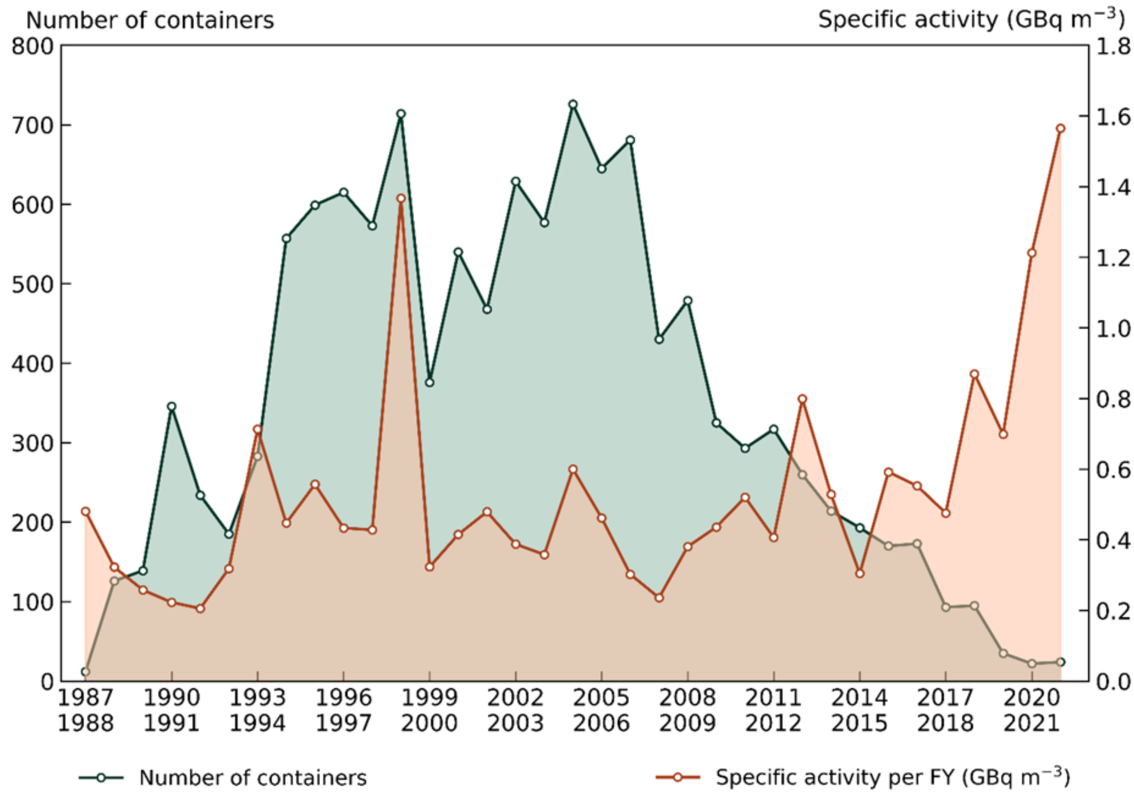


Figure 4.5: Specific activity and number of containers received per financial year for the disposed vault wastes

4.2.4 Bulk Materials

The composition of the bulk materials for processed waste in the disposed vault inventory is presented in Figure 4.6. The complete detailed material breakdown in terms of mass is given in Table A.6 in Appendix A3. We have not sought to convert masses into volumes owing to the uncertainties that are introduced by making assumptions on densities. The total mass of processed waste in the disposed vault inventory is 169,000 t.

Figure 4.6 shows that the largest coarse material group, by mass, is metal (38%). The majority of added primary containment materials (e.g. drum and box puck metal, but not including external container metal) are mostly metallic. There are also large quantities of concrete and rubble (15%), soil (11%) and ‘other’ materials (12%). When taken together, there is also a large amount of organic materials (rubber, plastics, other organics, wood and biodegradable materials), which total 18% of the waste by mass. Organic materials are generally less dense than other material categories so the volumetric proportion is likely to be greater than the mass proportion.

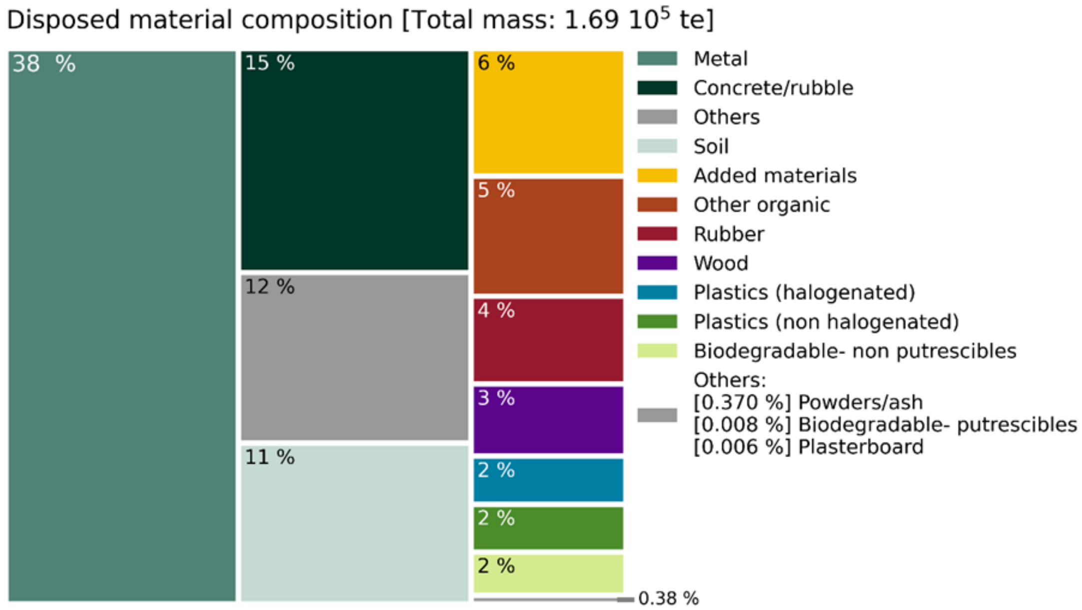


Figure 4.6: Disposed vault material composition for processed waste by mass

The total mass of processed waste in the disposed vault inventory (as presented in Figure 4.6) forms some 42% of the total packaged mass of 407,000 t, with grout contributing 49% of the total packaged waste mass and the mass of container material contributing the remaining 9%.

4.2.5 Non-radiological Contaminants

Historically, characterisation of non-radiological contaminants has not received as much attention as the radionuclide inventory. Efforts are ongoing across the nuclear industry to improve the quality and quantity of information for non-radiological contaminants for future wastes. Since 2016, we have requested data on non-radiological contaminants in the WCI form. Data collection has improved over time, but the mass amounts in the disposed inventory are not well understood, particularly for disposals prior to 2016. The disposed vault inventory for non-radiological contaminants is therefore based on the as-declared values since 2016, and we have not estimated masses for disposals prior to 2016. For the HRA, assumptions relating to the quantities of non-radiological contaminants that could be present in each material are applied [15].

4.3 Uncertainty

The sources of uncertainty for the disposed vault inventory are largely the same as for the trenches. Uncertainties arise when data for analogous waste streams are used to estimate the inventory in waste streams for which there are inadequate records and there are uncertainties associated with the characterisation of each waste stream. However, in general uncertainties are less than for the trenches because the records are better, there is less need to consider data from analogous waste streams and waste characterisation practices have improved.

The data for disposed vault wastes between 1st April 2018 and 31st March 2022 are based entirely on explicit declarations and are well understood compared with older disposals. There is a good degree of confidence in information that has been taken directly from WCI forms. Our work with waste consignors drives best-estimate reporting for radiological content of wastes for disposal at the repository, and requires consignors to define the technical approaches used to characterise their waste; however, some uncertainty exists in the different approaches that consignors have used to estimate values and there are inherent measurement uncertainties.

For vault wastes received prior to 1st April 2018, more than 90% of the radionuclide data are based on explicit declarations, with the remainder of the data estimated as described in Subsection 4.1.1 and in reference [24]. The estimation techniques used will have associated uncertainties higher than the explicitly declared data, though the quality of data and techniques used for the estimation have improved since the 2011 ESC.

There are greater uncertainties associated with the material data prior to 1st April 2018, as the current level of detail for materials was only requested from consignors since 2016, and we have had to estimate the detailed material breakdown for older consignments. Often, consignments are linked to material fingerprints based on waste stream or consignor identifiers. However, the material breakdowns may vary due to the heterogeneity within waste streams or waste from that consignor. Our updated inventory includes a detailed material breakdown from the appropriate fingerprint in addition to any material groups declared in the actual consignment documentation in an attempt to capture this variation.

As discussed in Subsection 4.2.5, we have not attempted to provide estimates of non-radiological inventory for consignments prior to the start of data collection on non-radiological contaminants in 2016. The HRA uses material data provided in the Stage 2 Reference Inventory and applies assumptions on the composition of contaminants in each material [15], but given the uncertainties, this is not included in the Reference Inventory. Data collection on non-radiological contaminants has improved over time and more recent consignments will therefore have lower associated uncertainties.

The disposed inventory for Vault 8 presented in this report is not the final inventory that is expected prior to capping of the vault. This is due to waste containers received after the disposed inventory cut-off date of 31st March 2022, which have been emplaced into Vault 8 to make use of the remaining space in the vault prior to capping. These changes will be taken into account in future updates of the disposed inventory.

5 The Reference Forward Inventory

5.1 Input Data Sources

Two principal data sources have been used to derive the Reference Forward Inventory. These are the 2022 UKRWI [21], which provides forward inventory information from 1st April 2022, and information on waste streams associated with the Nuclear New Build (NNB) programme that were not included in the 2022 UKRWI.

5.1.1 2022 UK Radioactive Waste Inventory

The 2022 UKRWI provides the most up-to-date and comprehensive account of radioactive waste and materials in the UK. Produced jointly by the Department for Energy Security and Net Zero (DESNZ) and the NDA, the inventory presents information on radioactive waste in stock at consignor sites as of 1st April 2022, as well as forecast future arisings based on planned site operations and decommissioning programmes. The inventory includes detailed data on volumes, masses, radioactivity, radionuclide composition, and the physical and chemical characteristics of waste. It also outlines current and planned treatment, packaging and disposal routes.

In total, the 2022 UKRWI comprises 1,324 waste streams, including four categorised as HLW, 650 as ILW, 642 as LLW, and 28 as VLLW [21]. Over 94% of the reported waste volume consists of lower activity waste (LLW and VLLW), and the inventory is dominated by forecast arisings at Sellafield Ltd. The 2022 UKRWI supports a wide range of stakeholders and plays a critical role in informing policy, strategy, regulation and stakeholder engagement for safe radioactive waste management in the UK.

Only some of these waste streams are relevant to the LLWR, as many are routed to alternative facilities. For example, Low-Activity LLW (LA-LLW) and VLLW may be consigned to permitted landfill, some streams may be incinerated, and Scottish ILW (except for Ministry of Defence (MoD) ILW arising in Scotland) is destined for near-surface storage or disposal as close to the sites where the waste is produced as is practicable [38]. Full details of how routing assumptions have been considered in screening waste streams against radiological constraints and LLWR capacities are provided in Subsection 5.3.3.

In addition to defined routes, the UKRWI also identifies 'opportunity routes', potential waste management pathways that are not currently confirmed but may be viable in the future. These routes reflect developing or emerging treatment and disposal options that have not yet been committed to by waste producers. Including opportunity routes in the inventory provides a more flexible and forward-looking view of waste management options, although their use remains uncertain and depends on factors such as regulatory approval, technical feasibility, and commercial arrangements. Full details of how opportunity routes have been incorporated into the inventory are detailed in Subsection 5.3.2.

5.1.2 Nuclear New Build

Another component of the Reference Forward Inventory is the potential for future waste from the UK's NNB programme. The National Energy System Operator (NESO) published the '2025 Future Energy Scenarios (FES): Pathways to Net Zero' report [39] which provides a range of scenarios for the contribution of NNB reactors to the total future energy needs for the UK. The report presents several scenarios, with a range of ~10-22 GW of energy output from NNB reactors. We have produced a conservative estimated inventory of the potential future waste generated from NNB reactors for our Reference Forward Inventory that broadly aligns with the upper bound figure of 22 GW.

Information on operational wastes for Hinkley Point C is included in the 2022 UKRWI. Information on decommissioning wastes for Hinkley Point C has been derived from Generic Design Assessment documentation for the site. In the absence of any information regarding wastes that may be generated from other future designs of NNB reactor, we have used the information about the Hinkley Point C wastes to derive the remaining NNB waste data for our Reference Forward Inventory.

5.2 Approach for Different Waste Populations

Four distinct populations of radioactive waste are considered in the Reference Inventory that may be disposed of in the vaults:

- LLW that is already present in Vault 8 and Vault 9 and 9a or is committed for disposal in ISO containers;
- LLW that has not yet been committed to a container type, for which alternative container types can still be considered;
- ILW that could be managed as LLW, where container surface dose rates are sufficiently low to permit co-disposal with LLW;
- ILW that requires additional shielding during handling and disposal.

Each of these waste types is associated with different packaging, shielding and stacking assumptions. These are described in more detail in references [4] and [9], and are summarised in the subsections below and Figure 5.1.

The volume of vault space taken up by each of the waste populations outlined above is determined by disposal efficiencies. Disposal efficiency refers to the proportion of available vault air space that is effectively occupied by the waste packages. It is determined by calculating the ratio of the total packaged volume that can be accommodated within a vault to the total volume of air space available. The volume occupied by the waste packages depends on the waste package type, stack height and whether or not the waste is disposed in a shielded module.

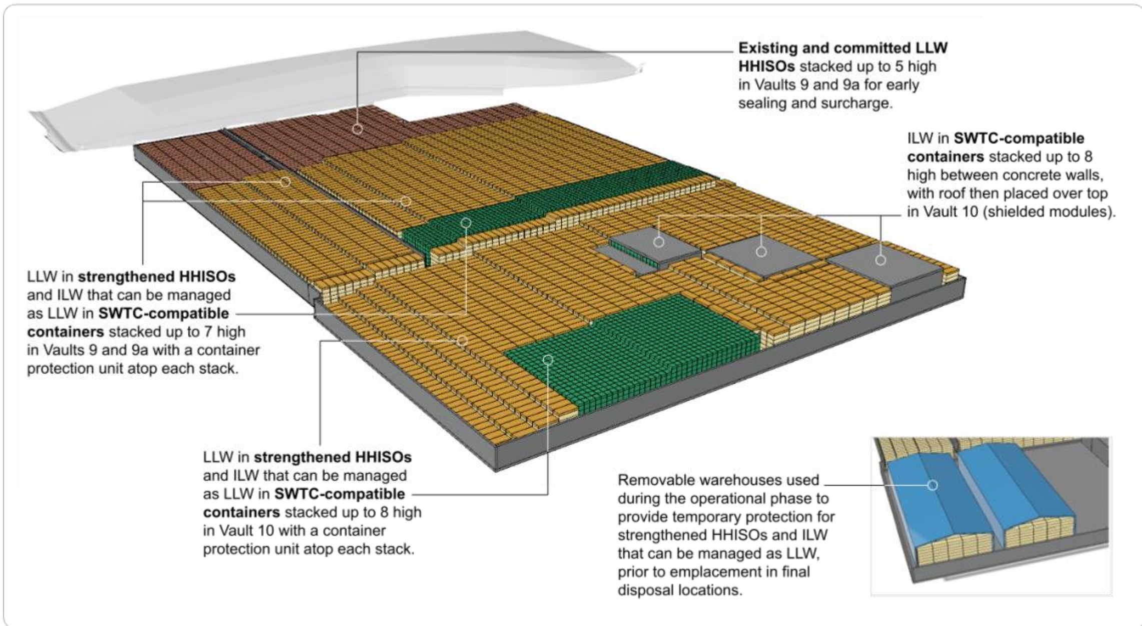


Figure 5.1: Distribution of different waste populations in the vaults

5.2.1 Approach for Existing and Committed LLW

For LLW currently disposed in Vault 9, or committed for disposal in standard ISO containers, the proposed approach involves the early installation of a strip cap system extending from Vault 8 into Vault 9 and 9a. The strip cap includes a membrane and a layer of bentonite-enhanced sand (BES), along with drainage layers, to provide early environmental protection to containers [4]. The containers will be surcharged prior to capping to create a stable platform for the final cap. Some damage could occur to the containers, but it is expected that they will still provide some containment and, as the cap is the main barrier, it is expected that the impacts of any container damage would be limited. A disposal efficiency of 60% is assumed for this waste category in the Reference Inventory.

5.2.2 Approach for Future LLW

For LLW that has not yet been packaged, an improved container design is proposed. This consists of strengthened HHISO containers with thickened corner elements to increase their load-bearing capacity [9]. These modifications would allow the containers to support the mass of overlying waste, profile fill, and the final cap. To protect container lids, which are not designed to bear load, a steel-reinforced CPU would be placed on the topmost container in each stack.

The strengthened ISO containers would be stored in temporary warehouse structures within the vaults before final emplacement and capping. The warehouses would offer basic environmental protection during the interim storage period.

A disposal efficiency of 80% is assumed for this waste category in the Reference Inventory. This represents an improvement compared with disposal in standard HHISOs, where lower disposal efficiencies reflect limitations in the maximum achievable stack heights, which constrain the volume of waste that can be effectively emplaced.

5.2.3 Approach for ILW that can be Managed as LLW

Some ILW streams may have external radiation levels low enough to permit co-disposal with LLW. For these waste types, disposal will take place in strong containers comprised of mild steel, which are compatible with SWTCs. The SWTC-compatible strong containers are placed within the transport containers for handling and delivery, but only the strong containers themselves are intended for disposal [40]. Like the future LLW containers, CPUs would be added to SWTC-compatible strong containers at the top of a stack to protect the upper containers from cap-related loads. Temporary warehouse storage would again be used to protect the waste packages before final capping. A disposal efficiency of 80% is assumed for this waste category in the Reference Inventory.

5.2.4 Approach for ILW that Requires Shielding

For ILW with higher surface dose rates that require shielding, disposal would be undertaken within purpose-built concrete structures. For the purposes of calculating the Reference Inventory, it is simplistically assumed that 40% of all ILW by volume would require placement in shielded modules due to high surface dose rates.

These shielded modules would include thick walls and roofs designed to reduce radiation exposure to workers and the public to As Low As Reasonably Practicable (ALARP). The shielded modules would also protect the containers from mechanical loads, allowing the disposal of waste packages that would not otherwise withstand capping loads, if required.

The wastes would be emplaced in corridors between structural walls. The corridors will be progressively capped with concrete roof tiles, which then form part of a thick concrete roof cast once disposals to the unit cease. Due to the space occupied by the concrete walls and structures, this approach results in a disposal efficiency of 60%.

5.2.5 Restrictions on Durable Containers

In the Reference Inventory, we exclude wastes packaged in 'durable' containers, defined as those primarily constructed from stainless steel or concrete, in the vaults. While isolated durable containers may be acceptable on a case-by-case basis, large-scale disposals will not be permitted. This is because of the potential impact of a substantial number of durable containers on the eroding repository and the resulting consequences for the radiological impact assessments and amenity value of the beach [14].

Consequently, only mild steel ISO containers (for LLW) or SWTC-compatible mild steel strong containers (for ILW, from 2033) are included in the Reference Inventory. This constraint has a direct implication for ILW, as the vast majority of ILW streams in the UKRWI are currently planned to be packaged in durable containers. For the purposes of the inventory derivation, we have not ruled out any ILW streams from consideration on the basis of planned package.

5.2.6 Vault Volumes and Capacity Planning

The available disposal volume, referred to as 'air space volumes', for Vault 9 and 9a and the conceptual design air space volumes for Vaults 10 to 14 are presented in Table 5.1 below. Future implementation is expected to follow a modular vault concept. Under this approach, vaults may not be sequentially numbered, and areas of vault space may be designated for specific waste types or disposal methods.

Table 5.1: Vault volumes

Vault	Air Space Volume (m^3)	Notes
Vault 9 and 9a	281,000	Remaining capacity as of 31 March 2022: 217,000 m^3
Vault 10	199,000	
Vault 11	141,000	
Vault 12	149,000	
Vault 13	154,000	
Vault 14	163,000	

5.3 Derivation of the Reference Forward Inventory

5.3.1 Waste Stream Inclusions and Exclusions

Some waste streams are excluded from consideration for the Reference Forward Inventory to reflect government policy and the diversion of waste away from the LLWR site. Some other inclusions and exclusions are needed to set out the basis for the LLW inventory expected to be received at the LLWR site. Key inclusions and exclusions for LLW and ILW are summarised in Table 5.2. A comprehensive detailed list of the waste stream groups that are included and excluded from consideration against the inventory constraints is given in the underlying *'Forward Inventory Methodology'* report [25].

Table 5.2: Key inclusions and exclusions for the Reference Forward Inventory

Inventory Component	Exclusions	Inclusions
Incompatible wastes and those suitable for diversion to alternative routes	VLLW streams on the basis that more appropriate disposal facilities are available for such wastes (e.g. disposal at an authorised landfill or disposal on-site). HLW streams on the basis that such streams are destined for disposal at a GDF. LLW or ILW sub-streams, or entire waste streams, identified: • for disposal at an authorised landfill; • for disposal at the site of origin; • for incineration; • as Out of Scope; or, • as for recycling or reuse.	
ILW streams in the 2022 UKRWI	Streams covered by Scottish Higher Activity Waste Policy [38]. Streams that have no reported activity in the UKRWI. Streams designated /C in the UKRWI because they are assumed to be already packaged in durable containers (see below).	ILW produced by MoD in Scotland because this waste is not in scope of Scottish HAW policy.
LLW streams in the 2022 UKRWI	All Dounreay and Vulcan LLW. Waste stream 7A37 containing contaminated mercury.	Sub-streams identified for LLW disposal. Sub-streams identified for supercompaction. Sub-streams identified for metallic treatment. Sub-streams for which the disposal route is reported as unknown.

During development of the Reference Forward Inventory we have assumed that wastes forming part of the LLW component of the inventory will be packaged into HHISO containers (standard HHISO containers pre-2030, proposed strengthened HHISO container design post-2030) and that ILW, if a decision was taken to accept any, could be packaged into SWTC-compatible strong containers from 2033.

ILW streams that have '/C' at the end of their 2022 UKRWI waste stream code were excluded from consideration when developing the Reference Inventory. '/C' is used in the UKRWI to indicate that waste has been conditioned and packaged for disposal in a GDF. Therefore, we considered unlikely that this waste could be put in SWTC-compatible strong containers for disposal at the LLWR.

There is significant uncertainty associated with the ability of waste producers to package wastes into non-durable packages such as the SWTC-compatible strong container (see Subsection 5.5 for discussion of uncertainty). In practice, there are populations of wastes that are already packaged in durable containers, or where there are plans for use of a durable container that cannot be changed. This is relevant to the ILW and LLW components of the inventory because it can affect portions of ILW streams in durable packages that have been identified for LLW disposal by waste producers.

5.3.2 Summary of Data Handling Steps

The data handling steps described in this subsection are applied to all waste streams recorded in the 2022 UKRWI and the derived NNB waste streams. Seven sequential data handling steps are followed for each waste stream. These steps, as detailed in Figure 5.2, are implemented using a structured set of spreadsheet tools and embedded macros. A full breakdown of the data handling process, including how processing parameters have been calculated, can be found in the underlying *'Forward Inventory Methodology'* report [25].

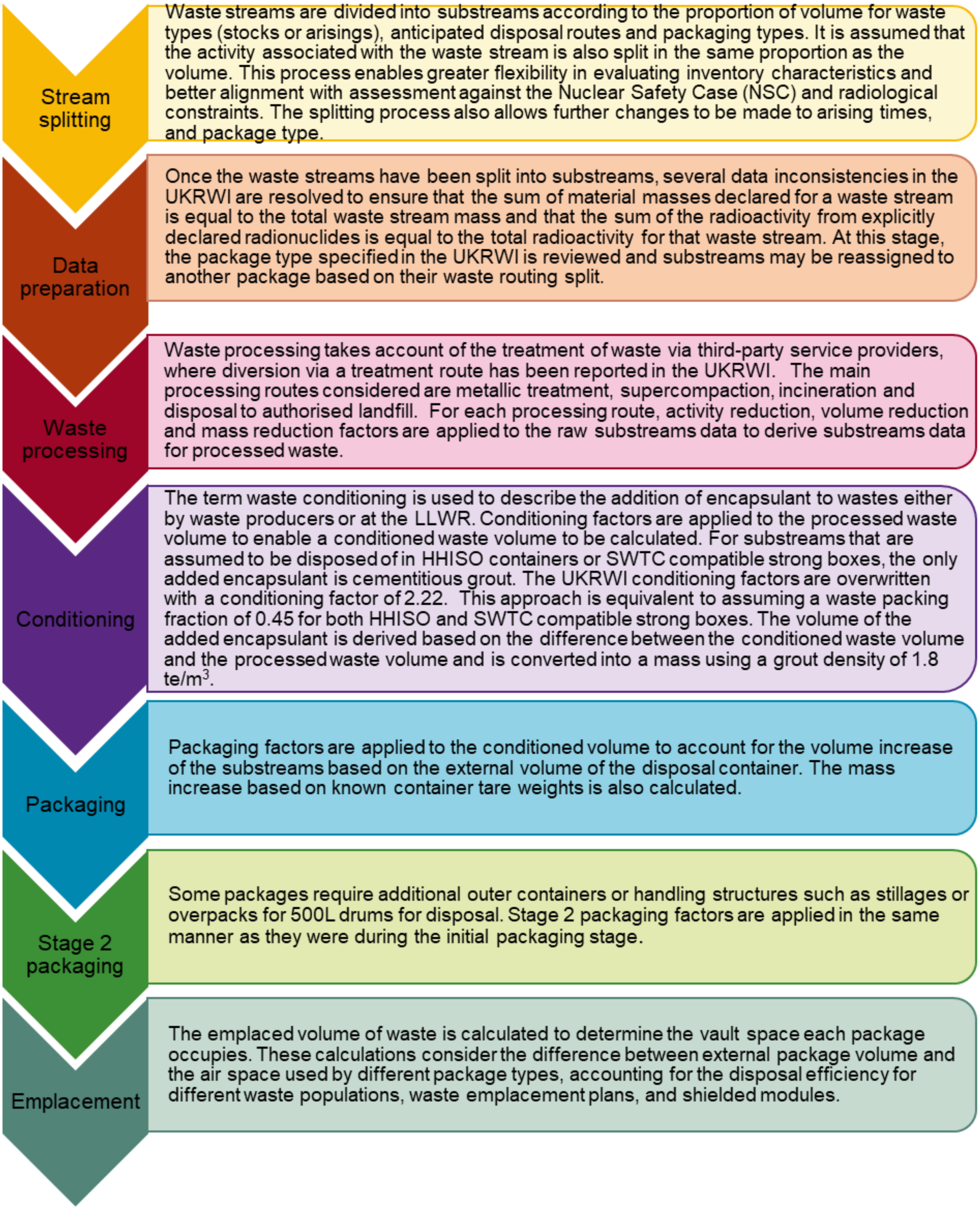


Figure 5.2: Summary of data handling steps for the Reference Forward Inventory

5.3.3 Assessment Against Constraints

There are radiological constraints on the inventory that can be accepted for disposal. The full set of constraints, which are derived from the ESC assessments, is set out in reference [17]. The Reference Inventory is constrained by the radiological constraints derived from the assessments in the ESC. These assessments have been progressively developed in phases. As we develop the assessments, we learn more about the radiological constraints that we should apply to the inventory. We have therefore developed our inventories through iteration with the assessments.

- Stage 1: constraints derived from previous studies considering alternative disposal options at the LLWR site, detailed in reference [41].
- Stage 2: constraints as above, with some targeted stream removals arising from early learning from Phase 1 assessments.
- Stage 3: updated constraints from Phase 1 assessments, cross-checked with early learning from Phase 2 [42].

The inventory data for Stage 1 can be found in the associated Data Management Forms (DMFs), [43, 44, 45, 46, 47, 48]. Inventory data for Stage 2 can be found in reference [26]. The underlying assumptions for each stage are discussed in the *'Forward Inventory Methodology'* report [25].

The above approach allows us to progress our understanding of the inventory and iterate it with the ESC assessments. Nevertheless, the inclusion of waste in the Reference Forward Inventory does not imply that it can or should be accepted at the LLWR; all waste would be assessed against the WAC during the waste acceptance process, including whether disposal at the LLWR was determined as BAT.

The constraints used to derive the different inventories were based on Phase 1 assessments, cross-checked with early learning from Phase 2. These include stream constraints which are applied to individual waste streams, based on the specific activity per package, and total radiological capacities which apply to the entire site inventory. These constraints were formulated to ensure that the estimated radiological impacts remain consistent with regulatory criteria. However, it should be noted that the final position on these constraints is presented in the Level 2 *'Implementation'* report [17], and does not correspond to any specific set of constraints derived during the Phase 2 assessments. The provenance and derivation of radionuclide limits associated with the stream constraints are presented in reference [42].

A sum-of-fractions approach is applied for both stream constraints and radiological capacities. For each radionuclide, the radionuclide limit provides the maximum activity that could be disposed of and result in peak radiological impacts consistent with regulations or guidance. In general, there are many different radionuclides which could be disposed. If, for each radionuclide, we were to dispose of an activity equal to the radionuclide limit, the assessed impacts could exceed relevant regulatory criteria. The sum-of-fractions approach provides a way to manage the disposal of many different radionuclides whilst ensuring the assessed impacts do not exceed relevant regulatory criteria.

Constraints are applied to sub-streams following the data handling steps (see Subsections 5.3.2 and 5.3.4). The contribution of each sub-stream is expressed as a fraction of the total allowable capacity under that stream constraint or capacity. For total site capacities, the individual fractions are summed across all sub-streams. The cumulative sum must remain below one for each radiological capacity to ensure compliance. This approach enables capacity usage to be tracked during selection of sub-streams (see Subsection 5.3.4). A full description of how the sums-of-fractions have been calculated is given in reference [25].

The stream constraints and total site radiological capacities are applied at two different stages, as shown in Figure 5.3. In the first stage, sub-streams are assessed against the stream constraints for the ESC and NSC. The radiological stream constraints for the human intrusion borehole driller scenario and coastal scavenger scenarios are applied to calculated activities per unit mass of packaged waste. For the NSC stream constraints, the NSC constraints for a waste drop scenario in which a container is inadvertently dropped are applied to calculate activity per package values. Other NSC scenarios were considered, however the waste drop scenario was found to be most limiting. In the second stage, there is a need to ensure that individual sub-streams that pass the stream constraints do not exceed the total radiological capacity of the repository. To do this, sub-streams that pass the stream constraints are assessed against the most limiting radiological capacities that reflect both short-term and long-term exposure pathways [14]. These are:

- recreational use of the coastline in front of the repository (Coastal Erosion);
- adults using coast for occupational use (Coastal Erosion);
- high-rate marine foodstuff consumer (Coastal Erosion);
- C-14 and radon post-closure release assuming a Period of Authorisation (PoA) duration of 100 years after the end of operations.

At the second stage, consideration is also required of the potential for doses to workers and the public from external irradiation by waste packages. Sub-streams that pass the stream constraints are analysed to identify sub-streams that could be problematic from an external dose perspective. The analysis is based on dose at the anticipated date of receipt at the LLWR site. For the ILW sub-streams that pass the stream constraints, external dose rate at 2 m is estimated based on Co-60 and Cs-137 activity. Sub-streams for which the external dose rate at 2 m exceeds 5 mSv h^{-1} are excluded from further consideration in the inventory. Sub-streams which do not exceed 5 mSv h^{-1} at 2 m are considered further but may have additional shielding requirements for handling and disposal, depending on the dose rate.

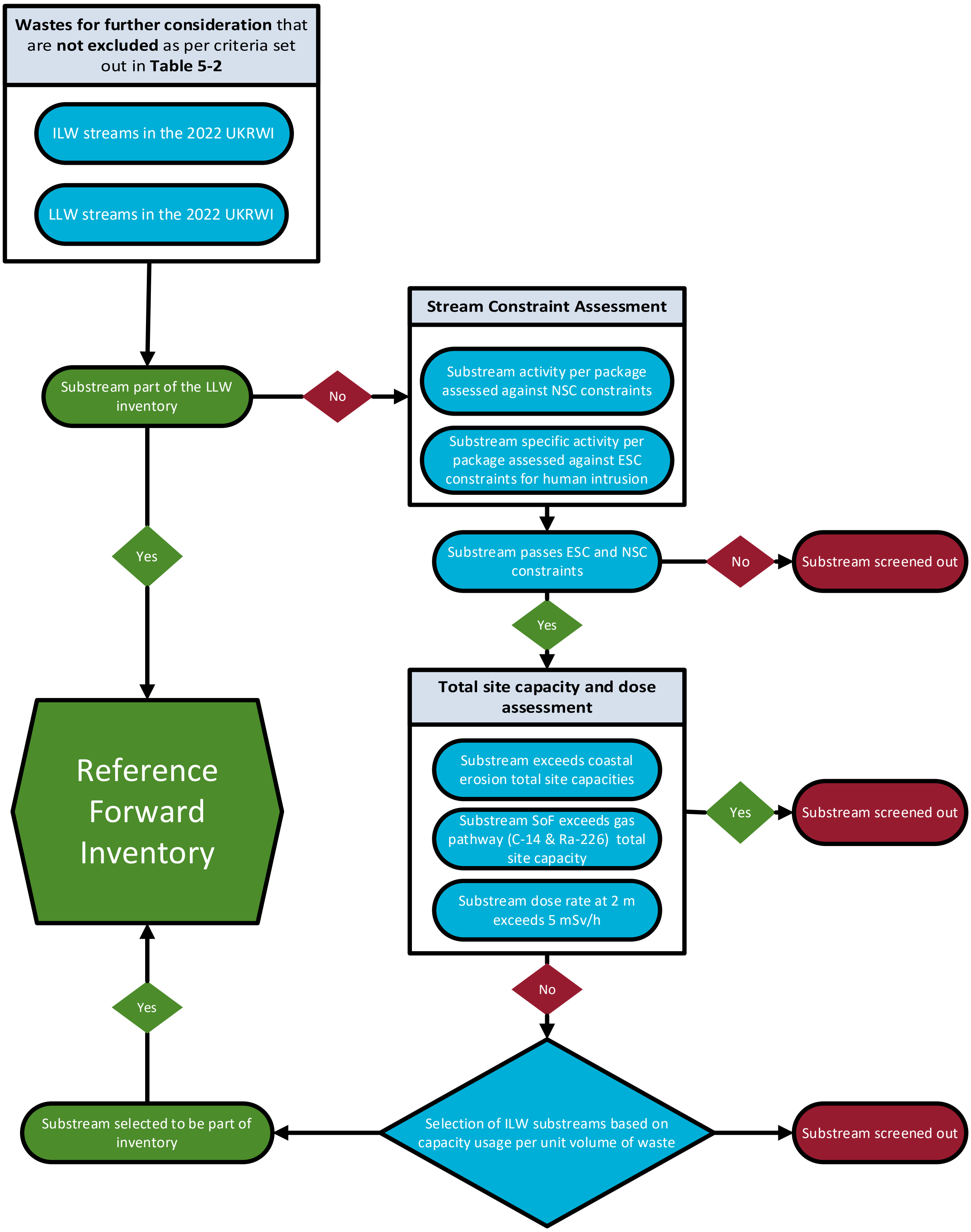


Figure 5.3: Assessment against stream constrains and total site capacities process

The constraints are applied to entire sub-streams. As a result, a key uncertainty arises regarding how representative the available sub-stream data are of the actual packages that would be produced from them. Waste is inherently heterogeneous, which means that even when we identify sub-streams that fail to meet stream constraints or contribute excessively to radiological capacity, there remains a possibility that some portions of the waste may still be suitable for disposal at the LLWR.

Conversely, it is also possible that certain packages within waste streams assessed as suitable for disposal in their entirety may not be appropriate when evaluated individually.

5.3.4 Selection of Sub-streams

The assessment against the capacities is intrinsically iterative. As sub-streams are tested and added to the Reference Forward Inventory, this informs the inclusion or exclusion of subsequent sub-streams.

Sub-streams are selected for inclusion in the Reference Forward Inventory based on a structured prioritisation approach, designed to produce a maximum volume of waste in the inventory while remaining within radiological constraints. The site also has a volumetric capacity; however, the radiological constraints are more limiting, and the volumetric capacity is not expected to be reached even if a decision is taken to accept ILW. This approach was taken to ensure that the Reference Forward Inventory provides an estimate of the volume of waste that might be sent to the LLWR, if a decision was taken to accept ILW. This supports the rest of the ESC to explore the capacity of the LLWR. It does not imply that decisions to accept such waste have been made, or that disposal of such waste at the LLWR would be considered BAT. Such decisions would be made based on the actual properties of the waste and wider circumstances at the time of consignment.

The selection of waste streams for inclusion in the inventory is guided by the following list of priorities:

- LLW streams are given highest priority, including NNB LLW. The baseline assumption is that all waste streams categorised as LLW are considered as part of the LLW inventory, unless they require exclusion as outlined in Table 5.2. The LLW component of the inventory includes LLW arisings reported in the UKRWI from ILW streams. Such LLW arisings may occur due to decay storage or because of decontamination processes. The LLW inventory also includes opportunity streams where the alternative management route was LLW disposal or a waste management route with final disposal as LLW, such as metallic treatment. The LLW inventory does not use all of the total radiological capacity of the vaults and so there is capacity for disposal of some ILW to be considered.
- ILW sub-streams from the UKRWI are selected based on their volume and capacity usage. ILW streams considered for disposal include operational and decommissioning wastes from existing nuclear licensed sites, unless they require exclusion as outlined in Table 5.2. The capacity usage per unit volume of waste is calculated for each sub-stream. Preference is given to ILW sub-streams that have lower capacity usage per unit volume to maximise total disposal volume and hence ensure the best use of vault space.

- NNB ILW streams are treated as the lowest priority and are only included if spare vault capacity remains after higher priority LLW and ILW streams have been selected. Only ILW streams from Hinkley Point C or Sizewell C are considered. This is because the option for disposal in a GDF will be available in the future for NNB ILW streams.

This approach has been developed to support the ESC to explore the capacity of the LLWR. It does not imply that all of these waste streams would in practice meet the WAC, that these prioritisation factors are the factors that would apply in practice, or that the decisions on these waste streams have been made. For further details on how we would propose to decide on the waste that could be consigned to the LLWR and prioritise allocation of the capacity in practice, see the *'Implementation'* report [17]. The sub-streams selected for the Reference Forward Inventory represent an estimate of the volume of waste that could be accepted within the bounds of the site capacities. Once waste is packaged and characterised, it may be found that some portions of waste streams in the Reference Forward Inventory are likely to exceed stream constraints, dose limits, individual radiological capacities, or not meet other WAC requirements when assessed during the waste acceptance process. As a result, these wastes would not be suitable for disposal at the site. However, it is not possible to identify exactly which portions will be affected based on the current data. Furthermore, some sub-streams that do not meet stream constraints or dose limits based on current data and the assumed packaging approach might be found to be acceptable in future after characterisation or if co-packaged with other wastes; this possibility has not been evaluated.

5.4 Results

5.4.1 Volumes

The total packaged volume of waste in the Reference Forward Inventory is approximately 468,000 m^3. This includes 376,000 m^3 of LLW, and 92,000 m^3 of ILW. Full details of the raw, processed, conditioned, packaged, and emplaced volumes per vault are given in Appendix A2 for the LLW inventory, and in Appendix B2 for the combined LLW and ILW inventory. Figure 5.4 shows the expected cumulative arisings of LLW, and when transitions between vaults occur based on projected vault arisings. Figure 5.5 presents the same information for the combined LLW and ILW inventory if a decision is taken to accept ILW.

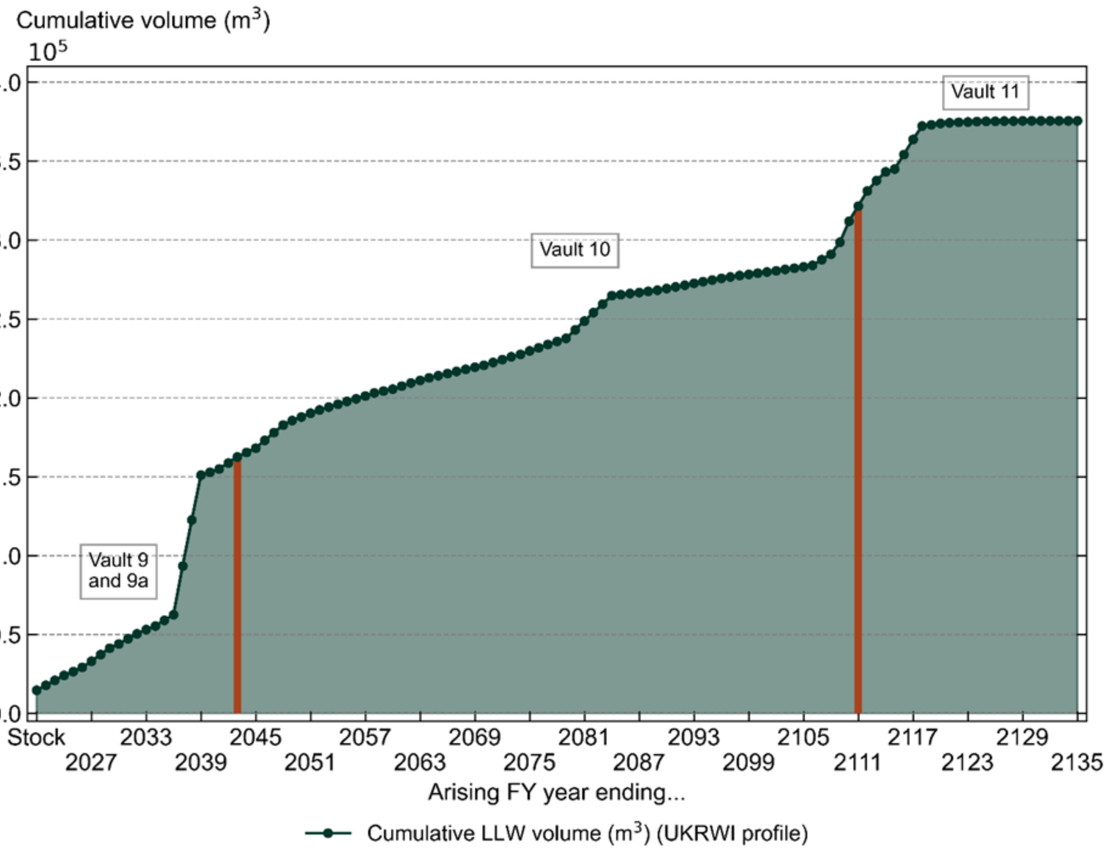


Figure 5.4: Cumulative packaged volume per year showing when the vaults will be used if only LLW is accepted for disposal, following the 2022 UKRWI profile (see Subsection 5.4.2 for detail on LLW profiles)

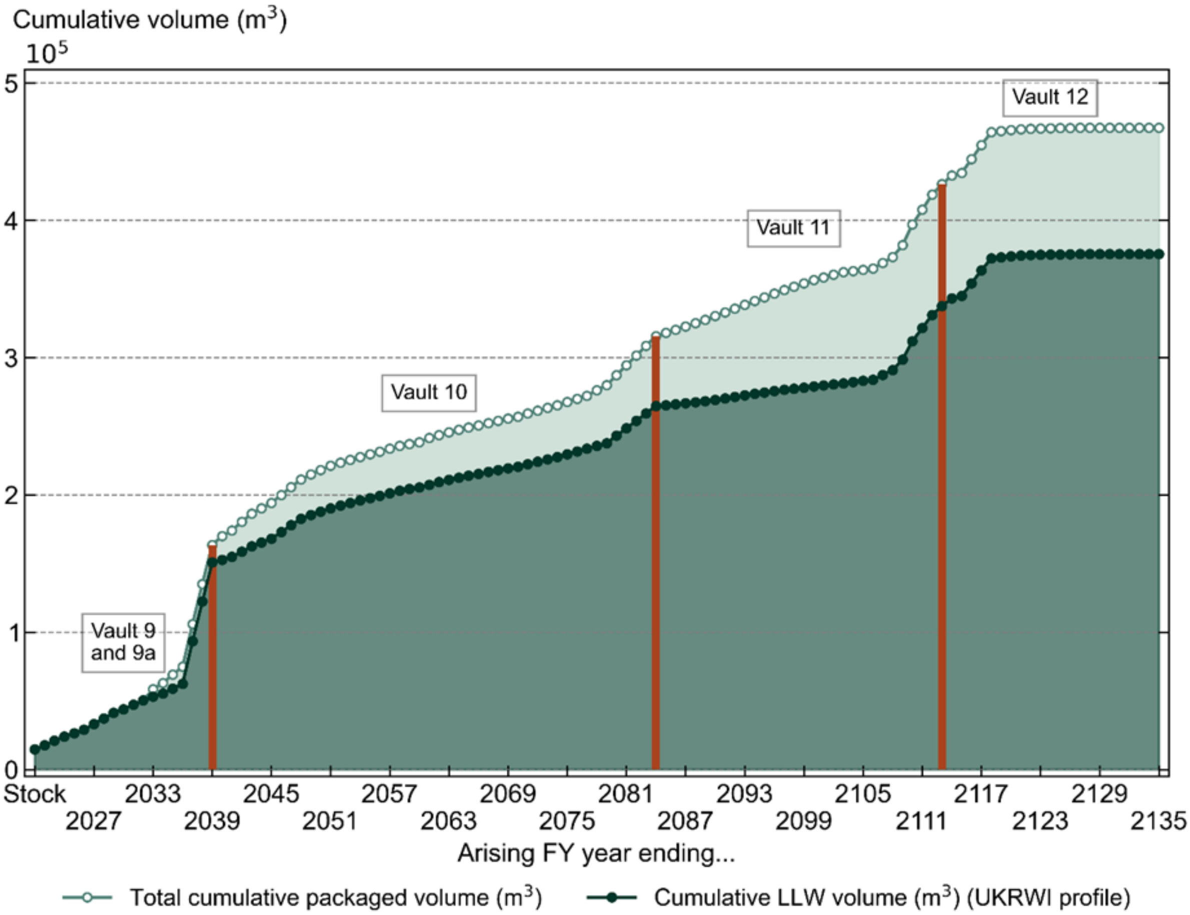


Figure 5.5: Cumulative packaged volume per year showing when vaults will be used if a decision is taken to accept ILW, using the full 2022 UKRWI profile

The waste volume expected per consignor for the LLW and ILW Forward Inventories are given in Figure 5.6 and Figure 5.7 respectively. For LLW, equal amounts of waste are expected from Sellafield Ltd, Magnox and EDF (29 to 30% each). Sellafield Ltd is expected to be the largest consignor of ILW, with 60% of the packaged volume, with Magnox and EDF making up the majority of the remaining volume with 24% and 11%, respectively.

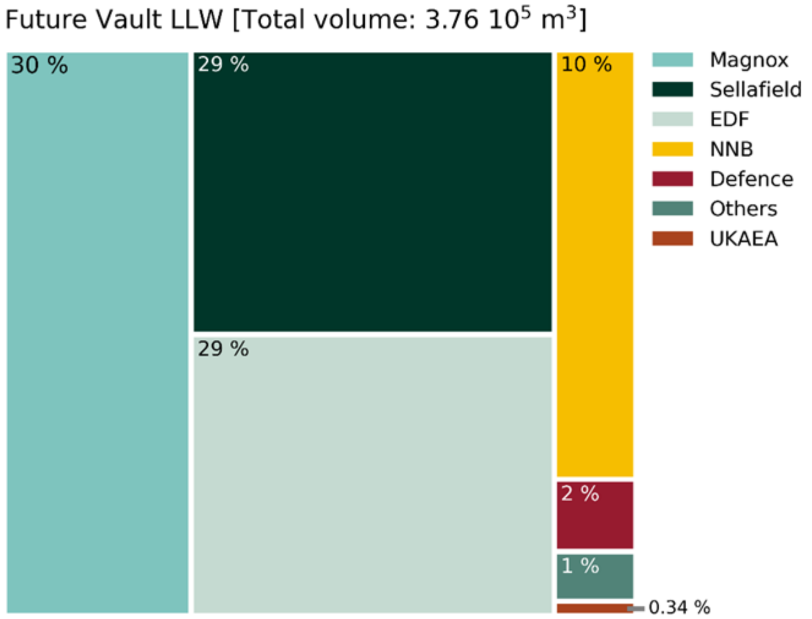


Figure 5.6: Packaged volume per consignor for the LLW Forward Inventory

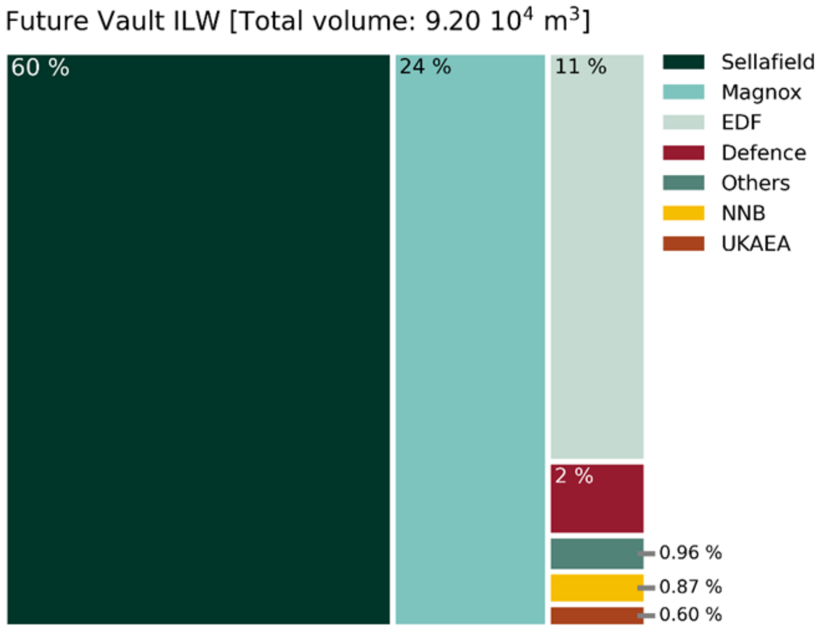


Figure 5.7: Packaged volume per consignor for the ILW Forward inventory

The Stage 2 Forward Inventory used in assessments consisted of 389,000 m^3 packaged volume of LLW and 88,700 m^3 packaged volume of ILW, for a total packaged volume of 478,000 m^3 [26]. The Stage 3 packaged volumes are all within 5% of the volumes given in the Stage 2 inventory. The LLW volume has slightly reduced due to improved understanding of the routing of some streams which will be supercompacted prior to packaging. The ILW volume has increased slightly due to the changes in the Stage 3 constraints allowing some additional waste streams to be included.

5.4.2 LLW Inventory Arisings

Receipt rates to the LLWR have been less than those forecast based on UKRWI since the 2011 ESC. Receipt rates of LLW affect several factors associated with site logistics, vault construction and design, and the operational management of doses. Thus, potential changes in the rate of future receipt of LLW to the LLWR site have been considered as part of the Reference Forward Inventory.

Forecasts of LLW receipts in the medium to long term are uncertain, so the approach taken as part of the Reference Inventory development programme has been to explore the uncertainty in receipt rates by using several LLW receipt-rate profiles. The three profiles explored are:

- the full 2022 UKRWI profile following waste arisings profiles as reported in the 2022 UKRWI;
- a reduced UKRWI profile where wastes are reduced by the ratio of cumulative actual disposals to Vault 9 until the end of March 2022, plus 100 containers representing an assumed number of disposals between April 2022 and March 2023, to the 2022 UKRWI estimate of cumulative container disposals to Vault 9 until the end of March 2023, assuming all UKRWI LLW stocks are disposed in between April 2022 and March 2023; and
- a further reduced UKRWI profile where wastes are reduced by the ratio of an assumption of 100 containers per year to the 2022 UKRWI estimate of container disposals in the 2022/2023 financial year (not including any contributions from stocks).

For both the reduced and further reduced profiles, the volume of waste assumed to be received to the LLWR in the Reference Forward Inventory profiles is reduced until 2035 and then progressively increased back up to the full 2022 UKRWI profile by 2046. The reduction factors used in the Stage 3 Inventory for the reduced and further reduced profiles respectively are 0.74 and 0.65. Total expected arisings are conserved with respect to the full 2022 UKRWI by spreading wastes that have been deferred from prior to March 2046 evenly over the remaining duration of the NDA programme.

The derivation of each of the profiles is described in detail in the underlying *'Forward Inventory Methodology'* report [25]. Data presented in this report always follow the full 2022 UKRWI profile unless stated otherwise.

The different profiles are all associated with the same radiological capacity usage for the LLW component of the inventory as, despite the waste arisings being deferred, the total waste volume, and the number of packages this generates, remain equal for the UKRWI, reduced UKRWI and further reduced UKRWI profiles. The reference dates given for the activity of radionuclides are unchanged from the UKRWI. Details of the profiles used in the radiological and non-radiological assessment calculations can be found in the related assessment reports.

5.4.3 Container Types

The number of containers for the Reference Forward Inventory and total packaged volume for each container type are presented in Figure 5.8. We have assumed any ILW would be disposed in the SWTC-compatible strong container, and therefore this population of containers represents the ILW component of the Reference Forward Inventory in Figure 5.8, and the remaining containers represent the LLW component. There are fewer SWTC-compatible strong containers in Vault 9 and 9a because shielded modules will not be constructed in Vault 9 and 9a, so the ILW arisings to be disposed of in shielded modules, whilst Vault 9 and 9a is open, will be deferred to Vault 10. Overall, the number of ILW containers is higher than the number of LLW containers, although the total packaged volume of ILW is lower. This is due to the SWTC-compatible strong containers having a smaller internal volume than the HHISO containers.

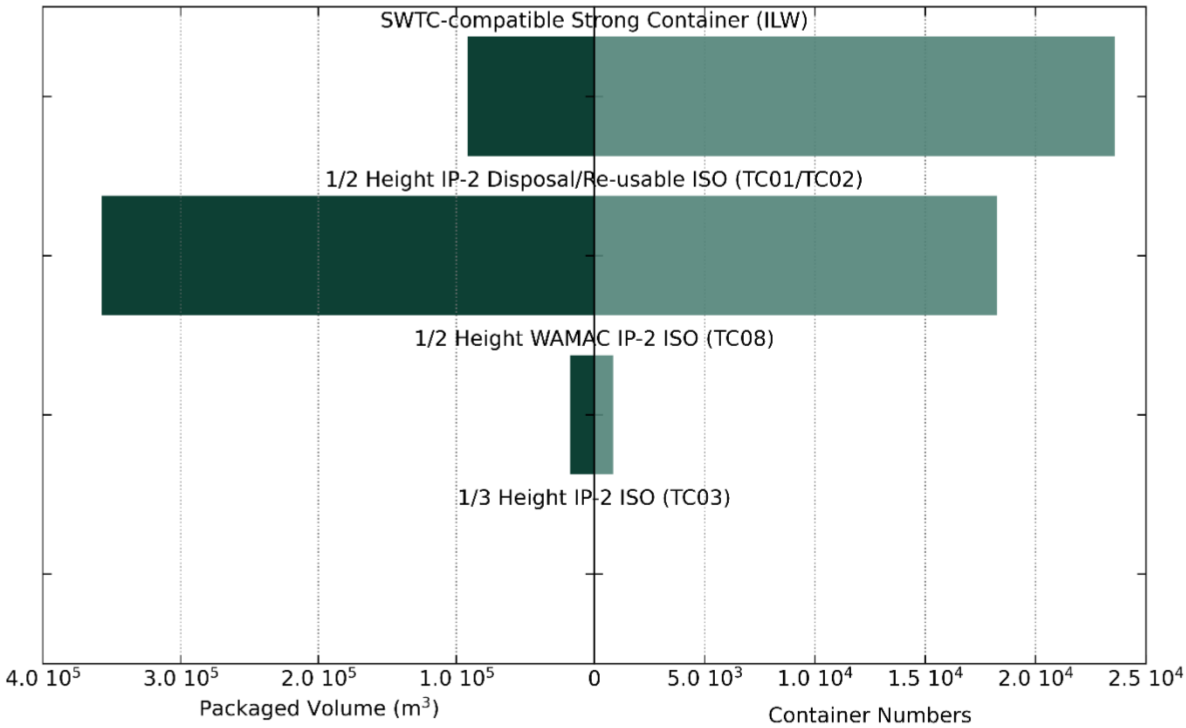


Figure 5.8: Packaged volumes and container numbers for the Reference Forward Inventory. The SWTC-compatible Strong Container represents ILW, the other containers represent LLW

The number of HHISO and HHISO WAMAC containers is unchanged from the Stage 2 inventory. The number of HHISO containers has decreased from 18,948 in the Stage 2 inventory to 18,265 in the Stage 3 inventory, as expected from the reduction in packaged LLW volume outlined in Subsection 5.4.1. Similarly, the number of SWTC-compatible strong containers has increased from 22,731 for ILW in the Stage 2 inventory to 23,578 in the Stage 3 inventory.

5.4.4 Radionuclides

There are 116 radionuclides reported in the 2022 UKRWI, including 114 individual radionuclides and two groups for other alpha- (OA) and other beta-emitters (OBG) not explicitly named on disposal forms. All of these radionuclides are included in the Reference Forward Inventory. The full list of radionuclides and their associated activities in each vault at the time of disposal are given in Table A.2 in Appendix A1 for the LLW inventory and Table B.1 in Appendix B1 for the combined LLW and ILW inventory. Figure 5.9 presents the total activities of LLW and ILW that would be present in each vault if a decision were taken to accept ILW. If only LLW is accepted, the total LLW activity will be distributed between Vault 9 and 9a, Vault 10 and Vault 11. The total activity of the LLW Forward Inventory is 1,840 TBq, and the total activity of ILW is 15,000 TBq, for a total activity of 16,800 TBq.

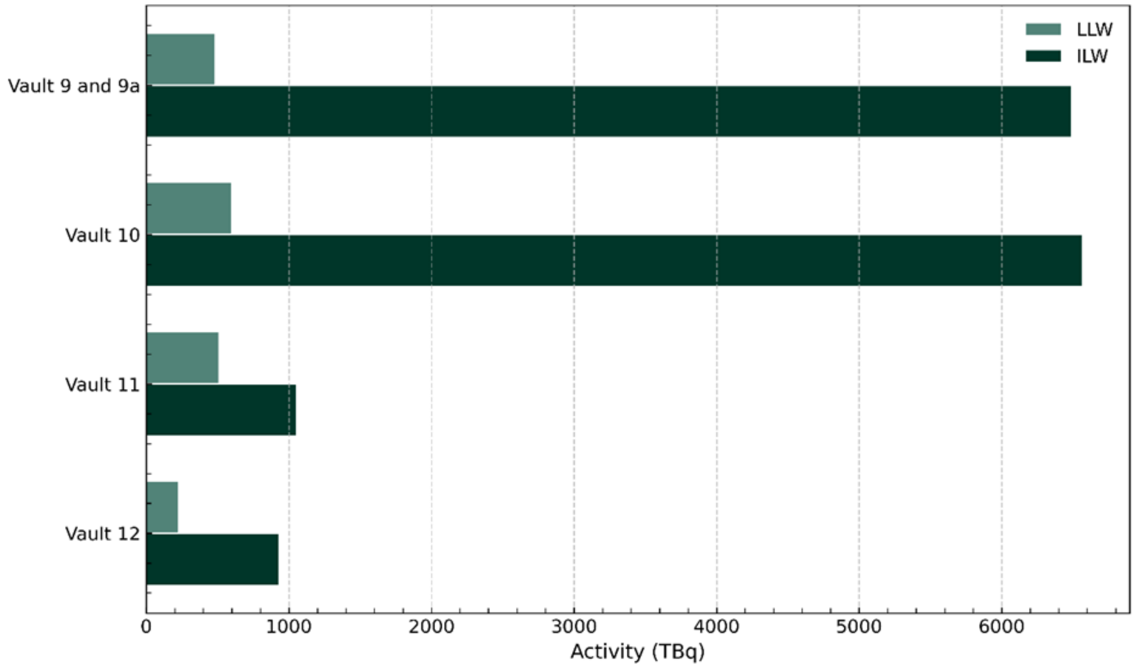


Figure 5.9: Activity in each vault for the LLW and ILW components of the Reference Forward Inventory

The activity of LLW in the Stage 2 inventory was 1,850 TBq. This is mostly unchanged in the Stage 3 inventory as the volume updates described in Subsection 5.4.1 did not impact the activity in those waste streams. The activity of ILW in the Stage 2 inventory was 5,870 TBq, for a total activity of 7,720 TBq. The ILW activity has increased to 15,000 TBq in the Stage 3 inventory, primarily due to the revised tritium constraints for the human intrusion pathway allowing for sub-stream 5H306_A_10_P43 to be included in the Stage 3 inventory, which contains 9,830 TBq of tritium.

5.4.5 Waste Stream Constraints

Each sub-stream has been assessed individually against the ESC specific activity constraints and NSC package activity constraints based on volume. In all cases, the vast majority of waste streams have a sum of fractions of less than 0.25; 90% of the packaged volume for the informal scavenger ESC constraint and over 99% for the other three constraints.

5.4.6 Bulk Materials

The composition of the bulk materials for processed waste in the total forward inventory and for the LLW and ILW components is presented in Figure 5.10. The breakdown per vault for the full detailed material list is given in Table A.6 in Appendix A3 for the LLW inventory and Table B.3 in Appendix B3 for the combined LLW and ILW inventory.

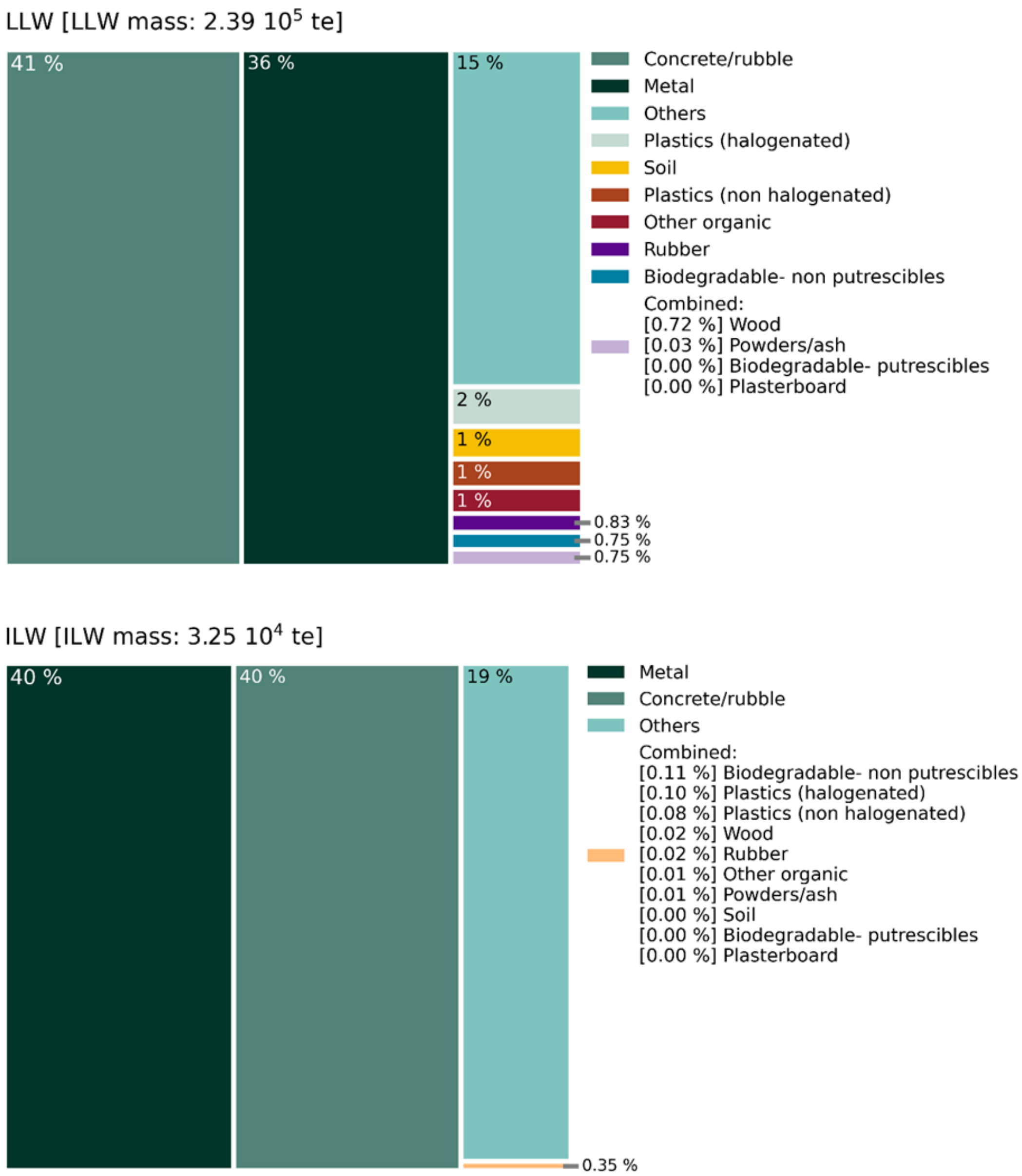


Figure 5.10: Bulk material composition by mass of processed waste in the Reference Forward Inventory

Figure 5.11 presents the compositions for the packaged wastes, including the processed waste (consisting of the materials given in Figure 5.10), the grout that is added to the packages, and the package materials. The SWTC-compatible strong container used for ILW is smaller and therefore has a higher ratio of package material compared to the internal volume than the containers used for LLW.

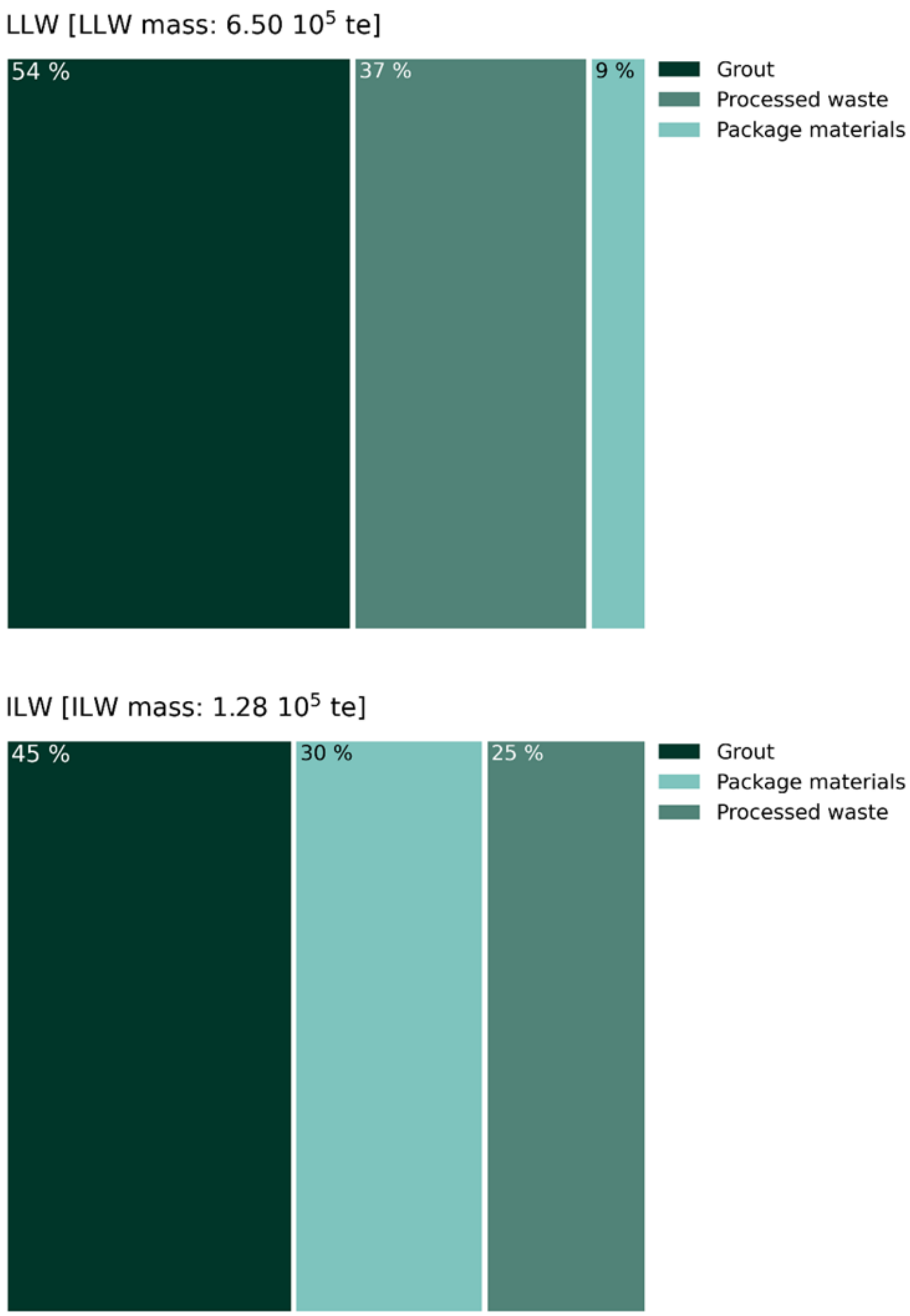


Figure 5.11: Composition of processed waste, package materials and grout in the Reference Forward Inventory

The bulk material composition and the composition of processed waste, package materials and grout is very similar in the Stage 2 and Stage 3 LLW inventories, with a variation of up to 1%. The ILW compositions vary slightly more, with the metal content increased from 32% to 41% from Stage 2 to Stage 3, and the concrete/rubble percentage decreasing from 47% to 40% in the Stage 3 inventory. The increased metal content is in part due to additional reactor steel streams which were able to be included with the updated constraints.

5.4.7 Non-radiological Contaminants

There are 46 materials in the Reference Forward Inventory that may be associated with non-radiological contaminants. The masses for these materials are included in the Reference Forward Inventory as reported in the UKRWI. The full non-radiological materials inventory is given in Table A.9 in Appendix A6 for the LLW inventory and Table B.6 in Appendix B6 for the combined LLW and ILW inventory. The inventory of non-radiological contaminants that require assessment as part of the HRA is derived by applying a fingerprint methodology to the Reference Inventory. Details of this derivation are given in reference [15].

The materials presented in Appendix A6 include contributions from electronic and electrical equipment (EEE), applied using fingerprints as detailed in reference [49].

5.5 Uncertainty

Whilst every effort has been made to ensure the presented inventories are robust, our results are subject to uncertainty, not least due to currently irreducible uncertainties in the quantity and radioactivity of wastes on consignor sites and uncertainty related to future strategic, regulatory and legislative changes. This uncertainty is different from the uncertainties identified in Subsections 3.3 and 4.3 in that it will be resolved when the future wastes reported in the UKRWI are characterised for onward treatment and management.

5.5.1 Management of Uncertainty in the LLW Forward Inventory

This section presents a discussion of the key factors affecting the uncertainty of LLW in the Reference Forward Inventory. It discusses the known uncertainties in relation to the source inventory data and also explores different scenarios that could lead to a fundamental change to the Reference Inventory.

5.5.1.1 Volume

The forward LLW disposal volume at LLWR is based on the 2022 UKRWI, which includes reported waste volumes, processing assumptions, and management routes. However, when these volumes are converted into packaged waste, the forecasted container receipts significantly exceed actual site receipts over the last few years, indicating an overestimation of waste volume in the UKRWI. Only 11% of the reported raw LLW volume is now expected to require disposal at the LLWR, which is a notable reduction from previous UKRWI versions, however, as noted above, this still results in a forecast that is significantly higher than anticipated future receipts, based upon the volume of waste received over the last few years. This difference is likely due to a combination of factors, e.g. varying approaches and cautiousness in producing estimations of waste volumes and radioactivity classifications (this may, for example, involve the reclassification of waste now thought of as ILW to LLW), evolving waste management practices that affect how the waste can be managed in practice and funding constraints.

Uncertainty bands are provided in the UKRWI, however, applying them across all LLW streams would result in unrealistic total volume ranges. Alternative arisings profiles have been developed to reflect recent trends in disposal receipts to the LLWR site and improve forecasting, maintaining total volume through a ramp-up approach (discussed in Subsection 5.4.2).

Overall, the presented Reference Forward Inventory volume for LLW is considered to be a best estimate based on the waste currently classified as LLW in the UKRWI, with actual volumes likely to be lower when better characterisation of the waste is undertaken in the future. However, some of the ILW reported in the UKRWI may be found to be at the levels of LLW, which would lead to an increase of LLW. Both scenarios are likely to be true and would result in opposite effects in terms of decreasing and increasing the volume of LLW requiring disposal at the LLWR site. Use of the reported volumes in the UKRWI is therefore judged to be an appropriate basis for the ESC.

5.5.1.2 Radionuclide Activity

The radionuclide activity data reported in the 2022 UKRWI have been used to calculate the total activity of the waste in the Reference Inventory. As for volumes, waste producers provide upper and lower uncertainty bands for the waste streams reported in the UKRWI and these can vary between a factor of 1.5 and a factor of 1,000. This degree of uncertainty will relate to how the radionuclide data have been derived for future waste that has not yet arisen. As waste producers retrieve the wastes, characterisation will be able to provide more accurate data to underpin the disposal of individual waste consignments to the LLWR.

5.5.1.3 Waste Treatment and Diversion Services

Another potential uncertainty associated with the LLW Forward Inventory is associated with the current assumptions for the management of the waste. UK policy and regulation states that waste producers must assess LLW against the waste hierarchy. This has led to the introduction of several treatment and diversion services to the nuclear industry.

Figure 5.12 shows the routing splits for LLW as reported in the 2022 UKRWI.

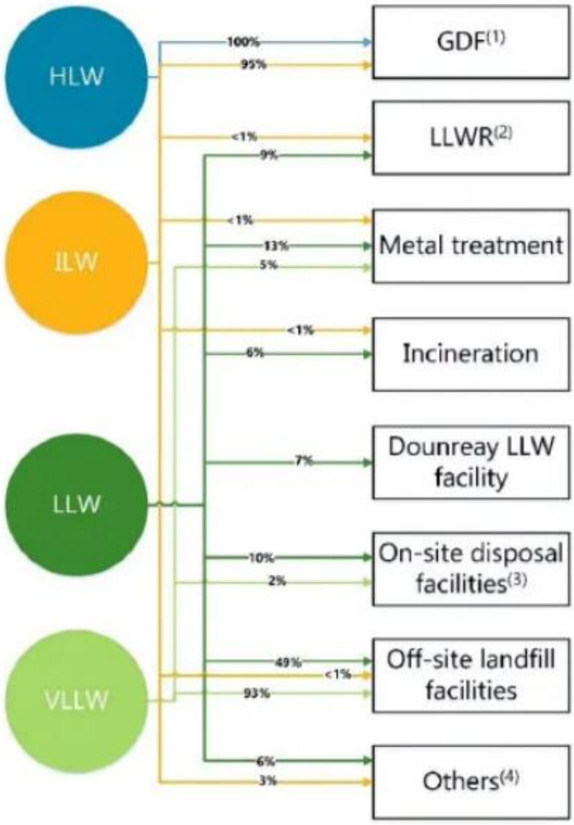


Figure 5.12: Projected disposal routes for radioactive wastes in the 2022 UKRWI (% of reported volumes), from reference [21]

As can be seen from Figure 5.12, there are several alternative management routes being used for the LLW reported in the 2022 UKRWI. Routing via metallic treatment represents 13% of the reported total raw LLW inventory according to the 2022 UKRWI. Incineration and authorised landfill facilities represent a further 6% and 49%, respectively, of the total. It can also be seen that on-site disposal facilities and 'others' make up a further 16% of the total volume. If any of these routes became unavailable or do not have the capacity for the waste volumes reported against the routes, this would lead to a significant increase in the volume of waste requiring disposal at the LLWR.

In addition to the additional LLW that could require disposal at the LLWR, the 2022 UKRWI also reports a raw waste volume of 2.75 million m^3 of VLLW [21]. This is almost twice the total LLW raw waste volume. The majority of this volume is reported in the UKRWI as requiring authorised landfill disposal capacity. Loss of this capability would lead to more waste requiring disposal than the LLWR would have the volumetric capacity for. The scenario in which the LLWR has the required increase in volumetric capacity to be able to accept the volume of VLLW is not currently considered feasible and has therefore not been analysed quantitatively.

5.5.1.4 Extended Operation of Current Nuclear Reactors

The UKRWI provides details of the wastes that will be generated in the operation and decommissioning of the UK's nuclear power station sites. The UKRWI data are based on plans for when nuclear power generation will cease at each site, and then the follow-on plans for care and maintenance and decommissioning. If the operating lifetime of a reactor is extended, this change will be reflected in UKRWI to maintain a current understanding. There are five UK reactors currently in operation. These are located across four sites at Hartlepool, Heysham (2 reactors), Sizewell B and Torness.

Based on the assumption that the Care and Maintenance and decommissioning phases would produce a similar volume of waste requiring disposal at the LLWR, the only impact on the total LLW waste volume that might require disposal at the LLWR would be from an increase in operational waste for the additional years of nuclear power generation. When considered alongside the other uncertainties discussed in this subsection, this uncertainty is very minor.

5.5.1.5 Nuclear New Build

As discussed in Subsection 5.1.2, we have produced an upper estimate of waste in alignment with the data published in the NESO report (cross reference to NESO report from Subsection 5.2). As this waste contribution is not based wholly on reported data, unlike the rest of the Reference Forward Inventory waste data (which is based upon the 2022 UKRWI), there is uncertainty that is recognised but cannot be quantified. We have used the best available data in deriving the estimated contribution to the LLW inventory for the LLWR site, as outlined in reference [25].

The contribution of the NNB waste to the total LLW inventory is approximately 10% by packaged volume and 13% by radionuclide activity. This provides an indication of what the potential impact on the LLW inventory for NNB waste would be if the quantity of waste from the NNB programme was to increase or decrease beyond our assumptions. As plans are realised, the quantities and types of waste for NNB will be included in the UKRWI dataset, reducing the uncertainties compared to the current estimates.

Overall, the presented contribution of waste from the NNB programme is a sensible estimate based upon the data available. We will continue to improve our understanding on this inventory topic with waste producers in the future.

5.5.1.6 NRS Decommissioning Strategy

The 2022 UKRWI data for LLW streams for the nine reactor sites managed by NRS were based on the strategy of deferred decommissioning. This typically results in the reactor sites going into Care and Maintenance for a period of ~50 years with little waste being produced over that period. The generation of decommissioning waste then begins in the 2070s to bring the sites to final stage clearance.

Since publication of the 2022 UKRWI, the decommissioning strategy has changed to bring forward the timescales for decommissioning. This change has been reflected in our development of the Reference Inventory.

The change brings forward the arisings timescales of the decommissioning wastes, which reduce the time for decay of waste. This introduces the scenario whereby LLW as reported in the 2022 UKRWI that may have been suitable for diversion away from the LLWR, may now require disposal at the LLWR. It may also be that ILW that would have decayed to LLW levels by the 2070s, will now need to be treated as ILW and packaged for an alternative disposal facility, e.g. a GDF. These factors would potentially increase and decrease (respectively) the volume of waste requiring disposal at the LLWR. However, if a decision is taken to accept ILW, it may be possible for some of this ILW to be sent to the LLWR.

Given the complexities and uncertainties involved in understanding what waste would still be suitable for disposal to the LLWR at the time of waste arising, no quantitative analysis of the impact has been undertaken.

5.5.1.7 LLW ISO Container Design Change

The container assumption used for the Reference Forward Inventory of LLW is that by 2030, we will have moved to using a new design of ISO container for the disposal of LLW. It is expected that this will improve overall vault filling efficiency to 80% (c.f. the current 60%), based on the ability to stack higher with the mass of the stack being better supported through the corner posts of the containers.

However, if the change to the new design is delayed, this would lead to a reduced vault filling efficiency because the old containers cannot be stacked as high. The extent of the impact would be dependent on the extent of the delay to switching to the new design. The strengthened HHISO container design programme has begun. If the implementation date was to be later than 2030, it is not anticipated that this would have a significant impact on the volumetric capacity usage of the LLWR.

5.5.2 ILW Included in the Reference Forward Inventory

The Reference Forward Inventory includes a volume of ILW that may potentially be acceptable for disposal to the LLWR in the future, if a decision is taken to accept ILW. The methodology for the rationalisation for the selection of ILW streams to be included in the Reference Forward Inventory was discussed in Subsection 5.3.4. However, there are factors that may preclude the waste streams included in our inventory from being able to be disposed of at the LLWR site. For example, when specific assessments on such ILW streams are undertaken, issues may arise with the compatibility of the SWTC-compatible strong container with a particular waste producer packaging plant, or with the transport of the waste package to the LLWR site.

Therefore, we expect that if the LLWR does accept ILW for disposal in the future, there will be wastes included in our inventory that will not be able to be disposed of at the facility in reality, and it is likely that there will be ILW streams (or parts of them) that are not included in our Reference Forward Inventory that will be found to be able to be disposed at the facility. This uncertainty would be resolved as waste is retrieved and characterised, noting that all waste would be assessed against the WAC during the waste acceptance procedure, including whether disposal at the LLWR is determined as BAT. The implementation of WAC will ensure that only wastes that are consistent with the specified radiological and non-radiological limits are disposed to the LLWR site.

This will lead to variance in the types of ILW that may be disposed of at the LLWR in the future compared with the ILW presented in this report as part of the Reference Forward Inventory. However, the ILW included represents a broad range of waste and so the impact on ESC assessment outcomes is not deemed significant. The *'Near Field'* report [5] discusses the impact of the material composition of the packaged waste on the evolution of chemical conditions and concludes that the grout and container steel are the key components in creating the favourable chemical environment.

5.5.3 Conclusions on the Uncertainties related to the Reference Forward Inventory

As shown by the above discussion, the uncertainty is complex and to a large extent irresolvable until the waste is characterised. We have discussed these and evaluated the key uncertainties. We have reduced them and continue to do so. The majority of uncertainties will be resolved by the time the waste is characterised and packaged for disposal. They can therefore be controlled by the waste acceptance process through a combination of waste acceptance controls (limiting what is accepted) and monitoring (to ensure ongoing disposals remain consistent with the assumptions in the ESC). These are set out in the *'Implementation'* report [17].

We have a sufficient understanding of the inventory to support the rest of the ESC. Uncertainty in the radionuclide and non-radiological contaminant content is largely controlled by undertaking capacity calculations and controlling disposals using that capacity. Uncertainty in the waste volume is considered in the respective assessments, and managed where appropriate. Uncertainty in the bulk material content is considered in near-field modelling and EPA, and subsequently managed in assessments. The dominant materials in the inventory are the metal containers and grout, the presence of which are known and are less uncertain.

Nevertheless, we accept that new information may arise that is unforeseeable, for example, a change in policy that impacts on diversion routes available. This would result in potentially significant impacts on the assumptions made about the Reference Forward Inventory. All aspects of the ESC are kept under active review and we would assess the impact of any changes as they arise, in accordance with established processes for managing the 'live' ESC.

6 Total Disposal Facility Inventory

6.1 Volumes and Package numbers

The packaged volumes in the total Reference Inventory (comprising of trench inventory, disposed vault inventory and forward inventory) are summarised in Table 6.1. Figure 6.1 shows the volumes in each vault and the trenches for the processed volume (the raw waste expected to be received to LLWR after any processing/treatment), the conditioned volume (processed waste and added grout), the packaged volume (the external volume of the packages) and the emplaced volume (the volume the containers fill in the disposal area). Note that only one volume is given for the trench inventory in both Table 6.1 and Figure 6.1, which is the processed waste volume, as the waste disposed to the trenches was not conditioned or packaged. If a decision is made not to accept ILW, the distribution of LLW between the vaults will vary, and Vault 12 will not be required. More detailed volume information is given in Appendix A2 for the LLW-only inventory and Appendix B2 for the combined LLW and ILW inventory.

Table 6.1: Packaged volumes for the total Reference Inventory. The volume for the trenches is the processed volume as the wastes were not conditioned or packaged

	LLW packaged volume (m^3)	ILW packaged volume (m^3)
Trenches	$8.15\ 10^5$	-
Disposed vault	$2.34\ 10^5$	-
Forward vault	$3.76\ 10^5$	$9.20\ 10^4$
Total	$1.42\ 10^6$	$9.20\ 10^4$

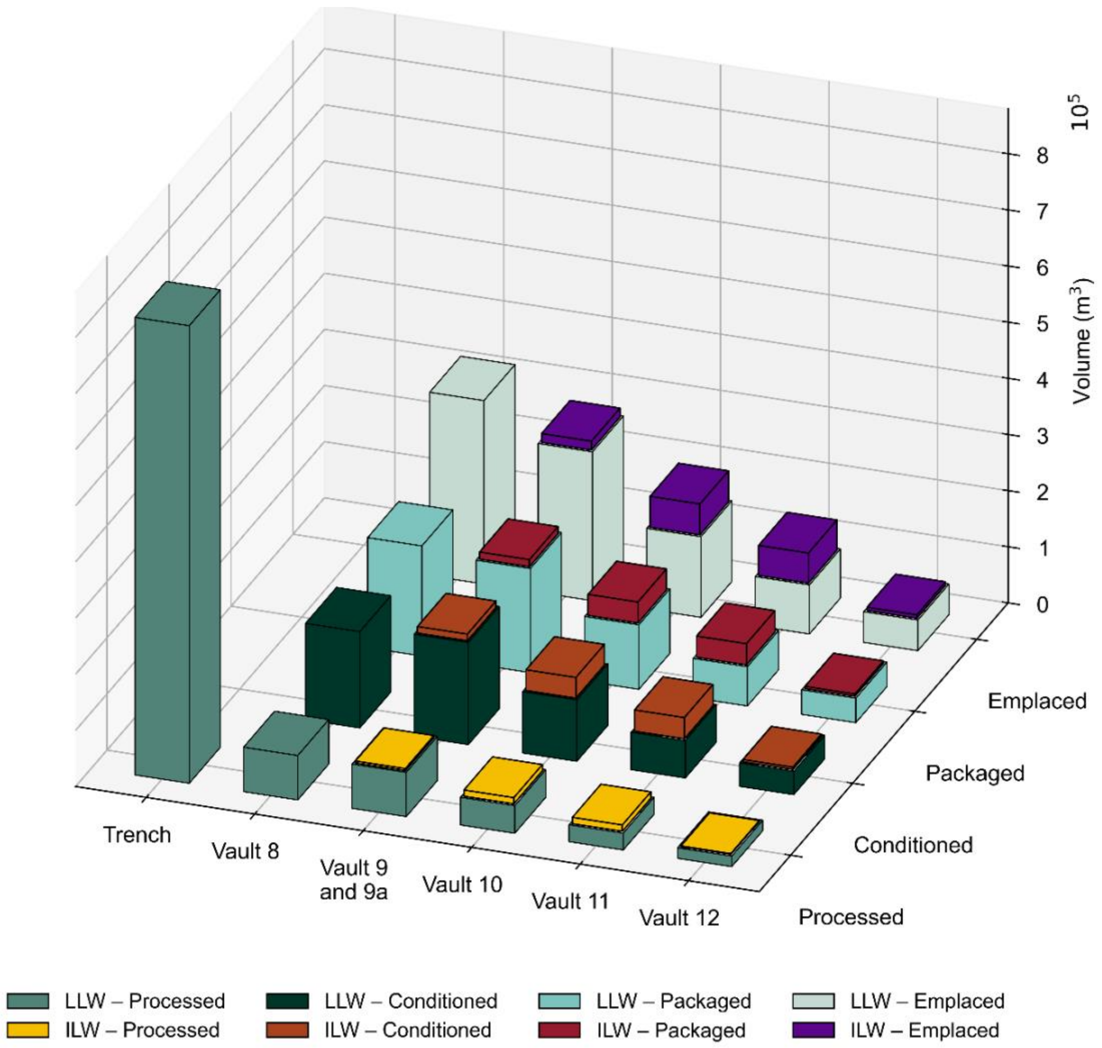


Figure 6.1: Volumes in the trenches and each vault. Only the processed volume is given for the trenches as these wastes were not conditioned or packaged. Volumes of LLW are shown in shades of green, the other colours represent ILW

The proportions of packaged waste per consignor for the LLW vault wastes are given in Figure 6.2, and the total Reference Inventory including ILW in Figure 6.3. Sellafield Ltd is the consignor with the largest overall proportion of waste, contributing approximately 40% of the total vault inventory.

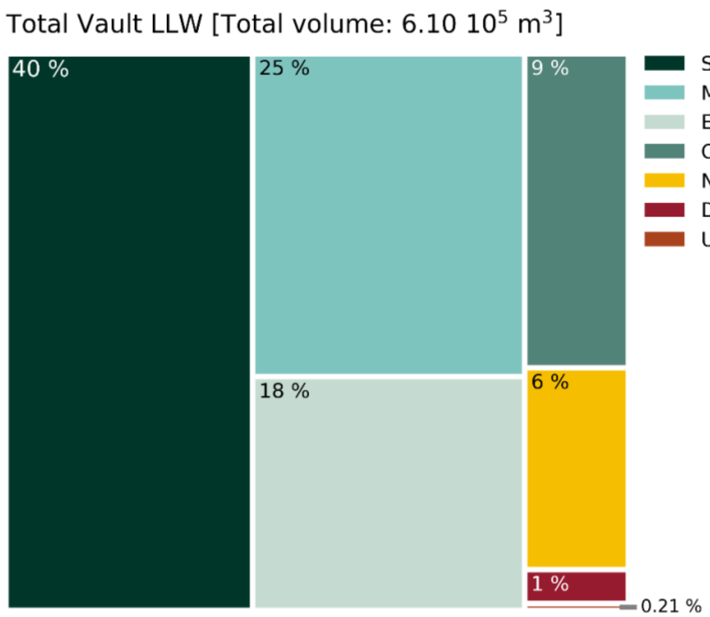


Figure 6.2: Packaged volume per consignor for LLW only

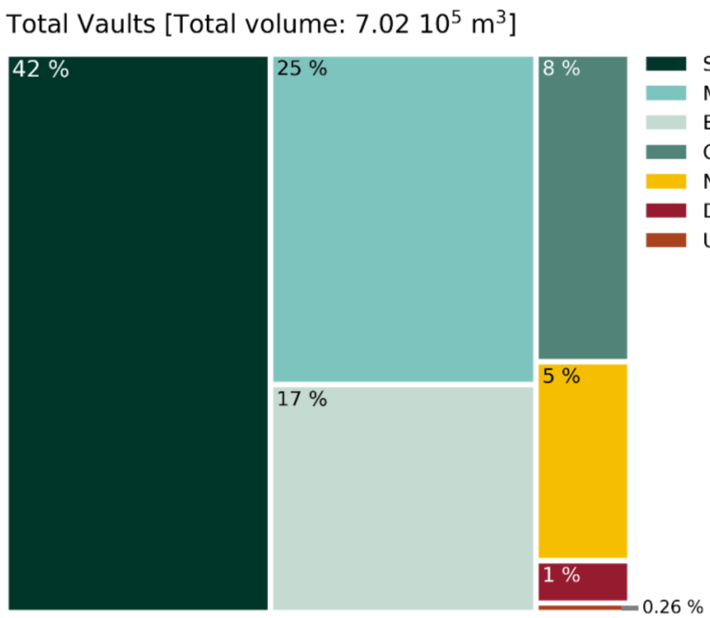


Figure 6.3: Packaged volume per consignor in the total Reference Inventory, including ILW

Figure 6.4 presents the numbers of each container type in the Disposed and Reference Forward Inventories. We have assumed any ILW would be disposed in the SWTC-compatible strong container, therefore this population of containers represents the potential ILW inventory, and the remaining containers represent the LLW inventory.

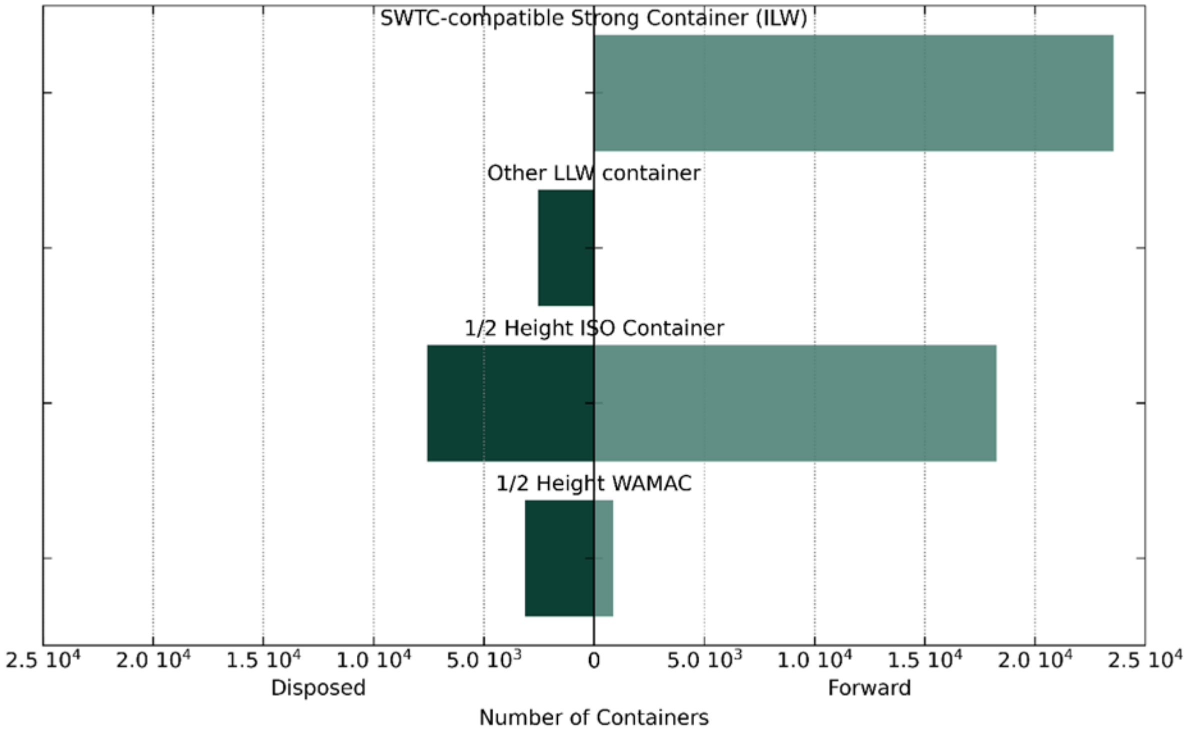


Figure 6.4: Container numbers in the Disposed and Reference Forward Inventory. The SWTC-compatible Strong Container represents ILW, the other containers represent LLW

6.2 Radionuclides

6.2.1 Summary of Total Activity

The packaged volumes and activities associated with the trenches, the Vault LLW, and Vault ILW are compared in Figure 6.5. If a decision is made to accept ILW, it can be seen that a relatively small volume of waste would be added to the vaults, but this would consist of the highest proportion of the total activity. Figure 6.6 gives the contributions from the trenches, disposed vault, forward LLW vault and forward ILW vault waste to the radionuclides which have been identified as potentially important radionuclides for assessments. For most of the potentially important radionuclides, the largest contribution would come from forward vault ILW wastes. Tc-99 has the largest contribution from the disposed vault wastes, and the trenches contribute the largest activities for Th-232 and U-238. Further discussion on these potentially important radionuclides is given in Subsection 6.2. More detail on the activities of all radionuclides is given in Appendix A1 for the LLW inventory and Appendix B1 for the combined LLW and ILW inventory.

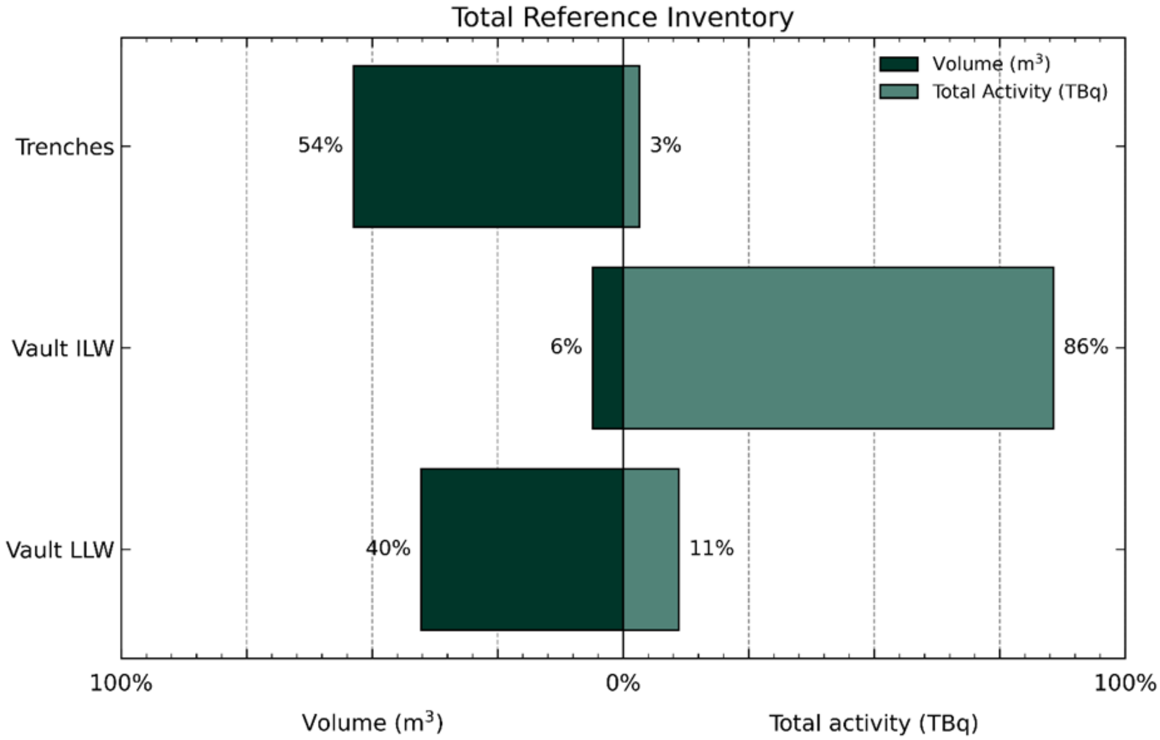


Figure 6.5: Comparison of the total activity and volume used by the trenches, Vault LLW and Vault ILW

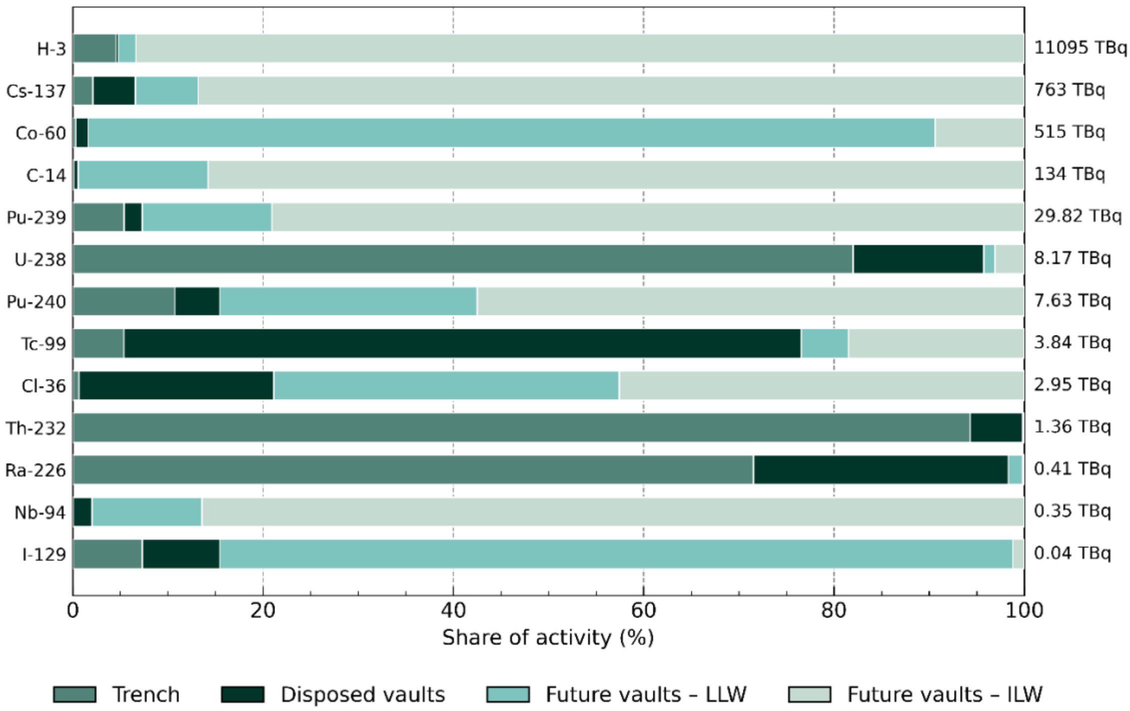


Figure 6.6: Activities of the potentially important radionuclides in the total Reference Inventory

6.2.2 Potentially Important Radionuclides for the Radiological Assessments

The potentially important radionuclides have been selected based on judgement of the outcomes of the assessment work detailed in *'Environmental Safety During the Period of Authorisation'* and *'Assessment of Long-term Radiological Impacts'* reports [13, 14].

For long-term assessments, four pathways are assessed:

- migration in groundwater;
- migration in gas;
- natural disruption and dispersion (coastal erosion);
- human intrusion.

During the PoA, members of the public may be exposed via permitted discharges and external irradiation from receipt and emplacement operations, and emplaced waste.

Table 6.2 summarises the radionuclides identified as potentially significant for each long-term assessment pathway and for the PoA.

Table 6.2: Potentially important radionuclides for different assessment pathways

	Groundwater	Gas	Coastal erosion	Human intrusion	Period of Authorisation
C-14		✓	✓		
Ra-226		✓	✓		✓
U-238			✓		
Tc-99	✓				
Th-232			✓	✓	
Pu-240			✓		
Cs-137				✓	✓
Nb-94			✓	✓	
Pu-239			✓	✓	
Co-60					✓
I-129	✓				

	Groundwater	Gas	Coastal erosion	Human intrusion	Period of Authorisation
Cl-36	✓			✓	
H-3					✓[3]

The potentially important radionuclides are distributed between different parts of the facility in a heterogeneous manner, even when the relative volumes of different trenches and vaults are accounted for. In certain cases, this heterogeneity is due to single waste streams with a high activity of a given radioisotope arising over a short period of time (for example Tc-99), in others it is due to the phasing of decommissioning activities (for example C-14 or Cl-36 from final stage reactor decommissioning of power reactors).

Carbon-14 (C-14)

The total C-14 activity disposed in the trenches is 0.1 TBq. The total activity disposed to the vaults is 0.64 TBq. The projected forward LLW C-14 inventory is 18.4 TBq.

There is a small amount of C-14 disposed in the trenches, which is primarily associated with operational wastes from Sellafield Ltd.

Of the C-14 disposed in the vaults, 18% is associated with consignments from WAMAC (Waste Monitoring and Compaction Plant). Disposals from the dockyards at Rosyth represent the next largest contribution of C-14 activity in the disposed vault inventory at 11%, across a large number of consignments.

Future LLW arisings are principally from reactor decommissioning activities. The top contributing Sub-streams are 9H322_A_4_Px_E (mild steel reactor decommissioning waste, Magnox) and Sub-stream 9F315_A_1_P4_E (reactor concrete and graphite wastes, Magnox), which together account for approximately 24.5% of the total forward LLW C-14 activity.

If ILW were accepted, the ILW inventory would be 115 TBq, giving a total vault inventory of 134 TBq. The ILW contribution arises primarily from Sub-stream 2S302_A_10_P17_E (Windscale Pile 1 and 2 graphite and aluminium wastes) and Sub-stream 5C302_A_10_P14_E (BEPO Reactor Decommissioning ILW from Harwell (Magnox)), which together account for approximately 16.5% of total forward vault C-14 activity.

[3] H-3 is a radionuclide of interest because contamination is currently observed in the groundwater plume.

Chlorine-36 (Cl-36)

The total Cl-36 activity disposed in the trenches is 0.019 TBq. The total activity disposed to the vaults is 0.6 TBq. The projected forward LLW inventory is 1.1 TBq.

The small trench contribution of Cl-36 is mainly from GE Healthcare and is likely surface contamination of laboratory wastes.

The largest contribution of Cl-36 to the disposed vault inventory is also from GE Healthcare, some 57% of the activity. This activity is spread across a large number of consignments consisting of different waste materials. 22% of the Cl-36 activity in the disposed vault inventory is from the WAMAC facility.

Future LLW arisings arise mainly from metallic reactor decommissioning wastes. The principal contributors are Sub-stream 3L320_A_4_Px_E (Secondary Stage 3 Decommissioning Waste, Heysham 1) and Sub-stream 9G317_A_1_P4_E (Concrete (Reactor and Non-Reactor) LLW, Trawsfynydd) together accounting for approximately 18% of the total forward LLW Cl-36 activity.

If ILW were accepted, the ILW inventory would be 1.3 TBq, giving a total vault inventory of 2.9 TBq. The ILW contribution arises primarily from Sub-stream 9H24_S_10_P2_E and Sub-stream 9H24_A_10_P29_E (burst can detector cooler ancillary components, Wylfa), which together account for approximately 22% of total forward vault activity.

Niobium-94 (Nb-94)

The total Nb-94 activity disposed in the trenches is $7.92\ 10^{-5}$ TBq. The total activity disposed to the vaults is 0.007 TBq. The projected forward LLW inventory is 0.04 TBq.

The single consignment with the largest Nb-94 activity in the disposed inventory (6%) is from UKAEA Windscale. Overall, UKAEA Windscale have consigned 13% of the Nb-94 activity. Sellafield Ltd has consigned the largest percentage, 40%, across many consignments.

Future LLW arisings arise primarily from activated stainless-steel components. The top two Sub-streams are 2F15_A_4_Px_E and 2F15_A_1_P4_E (LWR Pond Furniture (MEBs), Sellafield Ltd), accounting for approximately 20% of the total forward LLW Nb-94 activity.

If ILW were accepted, the ILW inventory would be 0.31 TBq, giving a total vault inventory of 0.36 TBq. The ILW greatest contribution arises from Sub-stream 2S302_A_10_Px_E (Graphite and Aluminium Charge Pans, Windscale) and Sub-stream 9B310_A_10_P12_E (Stainless Steel (Reactor) ILW, Bradwell), which together account for approximately 52% of total forward vault activity.

Technetium-99 (Tc-99)

The total Tc-99 activity disposed in the trenches is 0.21 TBq. The total activity disposed to the vaults is 2.7 TBq. The projected forward LLW inventory is 0.19 TBq.

The dominant source of Tc-99 in the trenches is reprocessed uranium from Capenhurst and Springfields.

The largest activity of Tc-99 is in the disposed vault inventory, with 2.38 TBq across a large number of consignments from URENCO consisting of a variety of different waste materials.

Future LLW arisings are associated with processing plant dismantling activities. The two principal contributors are Sub-stream 8A103_A_4_Px_E (Decommissioning Waste, Capenhurst) and Sub-stream 2C925_A_4_Px_E (Chapelcross processing plant dismantling waste), together accounting for approximately 42% of the total LLW Tc-99 activity in the LLW Forward Inventory.

If ILW were accepted, the ILW inventory would be 0.71 TBq, giving a total vault inventory of 3.6 TBq. The highest contributing Sub-streams are Sub-stream 2D137_A_10_P19_E (processing plants, tanks and silos, Sellafield Ltd) and Sub-stream 8A01_A_10_P16_E (Feed Filter Material, Capenhurst), together accounting for approximately 51% of total forward vault activity.

Iodine-129 (I-129)

The total I-129 activity disposed in the trenches is 0.003 TBq. The total activity disposed to the vaults is 0.003 TBq. The projected forward LLW inventory is 0.03 TBq.

The majority of the I-129 activity, 58%, was consigned by the WAMAC facility, with a further 27% from Sellafield Ltd. 10% of the total activity is from a single WAMAC consignment consisting of metal, soil, concrete and wood.

Future LLW arisings arise predominantly from processing plant wastes, with Sub-streams 2C925_A_4_Px_E and 2C925_S_4_Px (Chapelcross) accounting for approximately 93.8% of the total forward LLW I-129 activity.

If ILW were accepted, the ILW inventory would be 4.98 10^{-4} TBq.

Radium-226 (Ra-226)

The total Ra-226 activity disposed in the trenches is 0.29 TBq. The total activity disposed to the vaults is 0.11 TBq. The projected forward LLW inventory is 0.006 TBq.

93% of the Ra-226 in the trenches is from material generated from reprocessing Thorium ore, as a decay product of U-238. It was disposed in a small area of the trenches to the northwest end of Trenches 2 and 3.

The activity in the disposed vault inventory comes from several different consignors. Two of the largest contributors are GE Healthcare and the WAMAC facility, who have consigned approximately 18% and 16% respectively of the Ra-226 activity in the disposed vault inventory.

The top two contributors to the forward LLW Ra-226 inventory are Sub-stream 2C931_A_1_P4_E (Radioactive Sources, Chapelcross) contributing 0.002 TBq, and Sub-stream 5C55_S_1_P4 (Legacy LLW, Harwell) contributing 0.001 TBq. Together these Sub-streams account for 56% of the total forward LLW Ra-226 activity.

If ILW were accepted, the ILW inventory would be 6.2 10^{-4} TBq, giving a total vault inventory of 0.1 TBq. The conditional ILW contribution arises from Sub-stream 3M08_A_10_P8_E and Sub-stream 3M08_S_10_P8, together accounting for approximately 10% of total forward vault activity.

Thorium-232 (Th-232)

The total Th-232 activity disposed in the trenches is 1.3 TBq. The total activity disposed to the vaults is 0.07 TBq. The projected forward LLW inventory is 0.002 TBq.

Most of the Th-232 activity in the Reference Inventory is associated with the trenches and is due almost entirely to disposal of materials from the chemical industry, it is mostly located in Trenches 2, 4 and 5.

50% of the Th-232 activity in the disposed vault inventory has been disposed by Magnesium Elektron Ltd., with 17% from a single consignment which consists of a mix of materials. The second largest consignor is WAMAC, contributing 12% of the disposed vault activity.

Future arisings are associated with decommissioning and miscellaneous wastes. The principal contributors to the forward LLW inventory are Sub-stream 5C316_A_4_Px_E (Solid Waste Complex Decommissioning LLW, Harwell) and Sub-stream A2D120_A_1_P4_E (Uranium Plants Initial/Interim Decommissioning: Processing Plants, Sellafield Ltd). Together these account for 84% of the total forward LLW Th-232 activity.

If ILW were accepted, the ILW inventory would be 9.3 10^{-4} TBq, giving a total vault inventory of 0.08 TBq. The top two contributors to the inventory are Sub-stream 7J23_A_10_P16_E (Miscellaneous ILW, HMNB Portsmouth) and Sub-stream 2S302_A_10_P17 (Windscale Pile1 and Pile 2 Graphite and Aluminium Charge Pans, Windscale). Together these account for 34% of total forward vault activity (LLW+ILW).

Uranium-238 (U-238)

The total U-238 activity disposed in the trenches is 6.7 TBq. The total activity disposed to the vaults is 1.1 TBq. The projected forward LLW inventory is 0.09 TBq.

Most of the U-238 activity in the Reference Inventory is associated with the trenches. It is also reasonably well-distributed through the trenches and consists of residues and contaminated scrap from Springfields.

The WAMAC facility has consigned the largest amount of U-238 to the disposed vault inventory, approximately 30%. Springfields consigned 10% of the disposed vault U-238.

The two Sub-streams with the highest activity are Sub-stream 8A103_A_4_Px_E (Capenhurst Decommissioning Waste, Capenhurst) and Sub-stream 8A32_A_4_Px_E (UCP Metallic LLW, Capenhurst). Together these account for 36% of the total LLW U-238 activity.

If ILW were accepted, the ILW inventory would be 0.3 TBq, giving a total vault inventory of 1.5 TBq. The two largest contributing streams in the ILW inventory are Sub-stream 2D137_A_10_P19_E and Sub-stream 2D137_A_10_P17_E (Miscellaneous Plants Final

Decommissioning: Processing Plants, Tanks, Silos, etc., Sellafield Ltd). Together these account for 70% of total forward vault activity (LLW+ILW).

Plutonium-239 (Pu-239)

The total Pu-239 activity disposed in the trenches is 1.6 TBq. The total activity disposed to the vaults is 0.6 TBq. The projected forward LLW inventory is 4 TBq.

Pu-239 in the trenches is largely associated with wastes from Sellafield Ltd, and the largest inventory is located in Trench 2.

Sellafield Ltd has consigned the largest amount of Pu-239 activity in the disposed vault inventory, with 38% across a large number of consignments consisting of a variety of materials, and a further 16% from WAMAC. AWE is also a significant consignor with 17% of the Pu-239 activity.

In the Reference Forward Inventory, the two LLW Sub-streams with the greatest activity are Sub-stream 7A115_A_4_Px_E (Decommissioning LLW - Plutonium, AWE Aldermaston) and Sub-stream A2D116_A_1_P4_E (Miscellaneous Plants Initial/Interim Decommissioning: Processing Plants, Tanks, Silos etc., Sellafield Ltd). Together these account for 34% of the total forward LLW Pu-239 activity.

If ILW were accepted, the ILW inventory would be 23.6 TBq, giving a total vault inventory of 28.2 TBq. Significant activity contribution arises from Sub-stream 2D137_A_10_P19_E and Sub-stream 2D137_A_10_P17_E (Miscellaneous Plants Final Decommissioning: Processing Plants, Tanks, Silos, etc., Sellafield Ltd), together accounting for 83% of total forward vault activity.

Plutonium-240 (Pu-240)

The total Pu-240 activity disposed in the trenches is 0.8 TBq. The total activity disposed to the vaults is 0.36 TBq. The projected forward LLW inventory is 2.1 TBq.

Pu-240 in the trenches is largely associated with Sellafield Ltd, and the largest inventory is located in Trench 2.

35% of the disposed vault activity of Pu-240 has been consigned by Sellafield Ltd, across a large number of consignments with a variety of materials, with a further 15% from WAMAC. AWE has contributed 11% of the Pu-240 activity.

The two streams with the highest Pu-240 activity included in the LLW Forward Inventory are Sub-stream 7A115_A_4_Px_E (Decommissioning LLW - Plutonium, AWE Aldermaston) and Sub-stream A2D130_A_9_P4_E (Miscellaneous Plants Initial/Interim Decommissioning: Processing Plants, Tanks, Silos, etc (PCM), Sellafield Ltd). Together these account for 20% of the total LLW Pu-240 activity.

If ILW were accepted, the ILW inventory would be 4.4 TBq, giving a total vault inventory of 6.8 TBq. Significant activity contribution arises from Sub-stream 2D137_A_10_P19_E and Sub-stream 2D137_A_10_P17_E (Miscellaneous Plants Final Decommissioning: Processing

Plants, Tanks, Silos, etc., Sellafield Ltd), together accounting for 60% of total forward vault activity.

Cobalt-60 (Co-60)

The total Co-60 activity disposed in the trenches is 1.7 TBq. The total activity disposed to the vaults is 6.7 TBq. The projected forward LLW inventory is 458 TBq.

Co-60 is present in all of the trenches, with the largest contribution (33%) in Trench 7.

There is not a single significant consignor of Co-60 in the disposed vault inventory. The largest contributors are WAMAC and Research Sites Restoration Ltd at 16% and 14% respectively. Both of these contributions are spread over a large number of consignments.

For forward LLW arisings top two contributors are decommissioning metal waste from new build reactors (Sub-stream 3T13_A_4_P4_L (Hinkley Point C) and Sub-stream 0SZC13_A_4_P4_L (Sizewell C)) which together account for approximately 18% of the total forward LLW Co-60 activity.

If ILW were accepted, the ILW inventory would be 48 TBq, giving a total vault inventory of 513 TBq. The top ILW contributors are Sub-stream 6N102_A_7_Px_E (Decommissioning Bulk Steel, Rutherford Appleton Laboratory) and Sub-stream 3S302_A_10_P25_E (Mild Steel ILW, Sizewell B), which together account for approximately 5% of total forward vault activity.

Caesium-137 (Cs-137)

The total Cs-137 activity disposed in the trenches is 16 TBq. The total activity disposed to the vaults is 34 TBq. The projected forward LLW inventory is 50 TBq.

Cs-137 is present in all of the trenches, with the largest contribution (39%) in Trench 7.

Sellafield Ltd has consigned 23% of the disposed vault activity for Cs-137 across a large number of consignments, with an additional 16% from WAMAC. GE Healthcare have also consigned 19% of the activity.

Future arisings are associated with miscellaneous plant interim decommissioning wastes from Sellafield Ltd, principally Sub-stream A2D116_A_1_P4_E and Sub-stream 2D109_A_4_Px_E, which together account for approximately 46% of the total LLW Cs-137 activity.

If ILW were accepted, the ILW inventory would be 663 TBq, giving a total vault inventory of 747 TBq. Largely, the ILW contribution arises from Sub-stream 2D137_A_10_P19_E and Sub-stream 2D137_A_10_P17_E, which together account for approximately 90% of total vault activity.

Tritium (H-3)

The activity of tritium dominates the trench inventory at 502 TBq of the total. The majority of the tritium (447 TBq) is in Trench 6, with the source being Harwell Betalights, which were treated as Specific Consignments. As discussed in Subsection 3.2.2, the activities presented relate to when the waste was disposed of to the trenches. For tritium, with a half-life of 12.3 years, and noting the end date for disposals in Trench 6 of 1985, the total activity will have decreased significantly from the 502 TBq presented above.

The total activity of tritium in the disposed vaults is 28.2 TBq. 45% of activity has been consigned from GE Healthcare, with an additional 21% from Inutec ltd.

The total tritium inventory associated with LLW is 204 TBq. The majority of this activity arises from a small number of key waste streams. The largest contributor is D7J25_S_1_P4, which accounts for 109 TBq, representing approximately 53% of the total forward LLW tritium inventory. The second largest contributor is 9G317_A_1_P4_E, contributing 13.9 TBq, which corresponds to approximately 6.8% of the forward LLW total. These streams correspond to luminised waste from the MoD and concrete LLW from the Trawsfynydd site, respectively.

If ILW were included in the inventory, the total tritium activity would increase by approximately 10,400TBq. The ILW inventory is heavily dominated by a single waste stream, 5H306_A_10_P43_E, which contributes 9,830 TBq, representing approximately 94.9% of the ILW tritium inventory. This stream originates from activated ILW associated with the JET decommissioning programme at Culham. The second contributing stream, 7A22_S_10_P8, contributes 115 TBq, representing a small fraction (1.1%) of the ILW total and corresponds to operational ILW tritium hard waste from AWE Aldermaston.

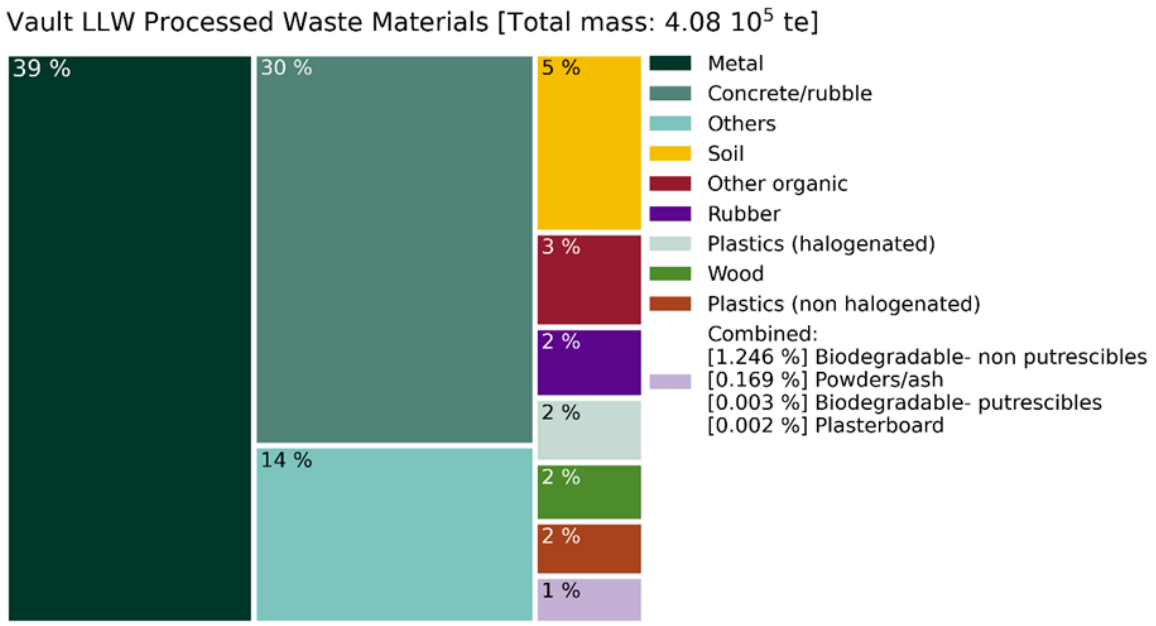
Summary

Across the LLW Forward Inventory, a small number of Sub-streams recur as one of the highest activity contributors to more than one potentially important radionuclide. Sub-stream 8A103_A_Px (Decommissioning Wastes, Capenhurst) is one of the top two highest activity contributing Sub-streams for Tc-99 and U-238. Likewise, Sub-stream 7A115_A_4_Px_E (Decommissioning LLW - Plutonium, AWE Aldermaston) and is a key contributor to Pu-239 and Pu-240 activity. Sub-stream A2D116_A_1_P4_E (Miscellaneous Interim Decommissioning, Sellafield Ltd) is also a key contributor to both Pu-239 and Cs-137.

Within the ILW inventory, Sub-streams that are derived from waste stream 2D137 (Miscellaneous Plants Final Decommissioning: Processing Plants, Tanks, Silos, etc., Sellafield Ltd) are main activity contributors to potentially important radionuclides Tc-99, I-129, Cs-137, U-238, Pu-239 and Pu-240. Potentially important radionuclides C-14, Th-232 and Nb-94, each have high activity contributions from Sub-stream 2S302_A_10_P17 (Windscale Pile1 and Pile 2 Graphite and Aluminium Charge Pans, Windscale). Sub-streams related to 2D137 and 2S302 together account for 54% of the total ILW Stage 2 Packaged volume, indicating that the wastes which dominate activity across several of the potentially important radionuclides also represent a substantial portion of the packaged ILW volume. This alignment highlights the significant influence that these waste streams have on the ILW inventory.

6.3 Bulk Materials

The compositions of the bulk materials for total processed waste in the vaults (disposed and forward) for the LLW only inventory and the total combined LLW and ILW inventory are presented in Figure 6.7. The breakdown per vault for the full detailed material list is given in Appendix A3 for the LLW inventory and Appendix B3 for the combined LLW and ILW inventory. The percentages of processed waste, conditioning materials and package materials are presented in Figure 6.8.



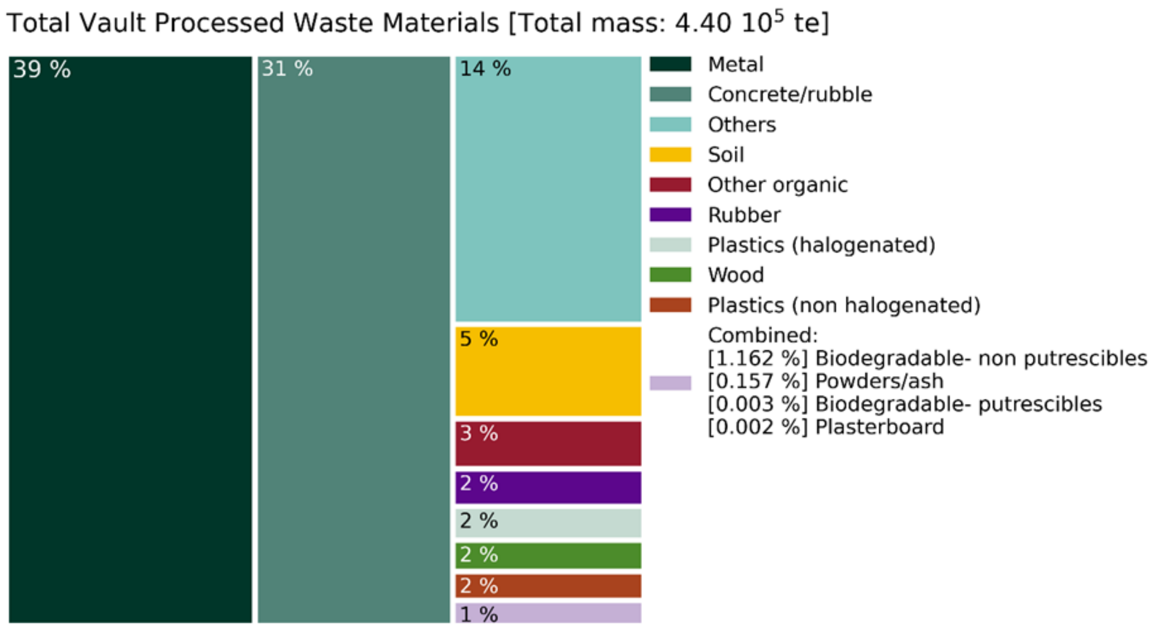
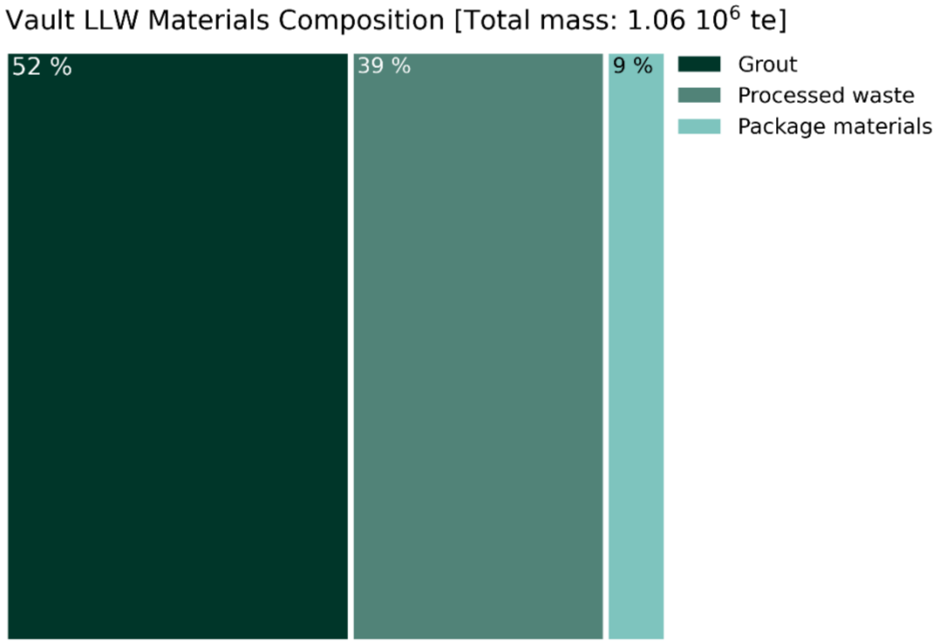


Figure 6.7: Material composition of processed waste in the vaults for the LLW-only inventory (top) and the combined LLW and ILW inventory (bottom)



Treemap chart showing the LLW only inventory. split into grout at 52%, processed waste at 39% and package materials at 9%, with a legend on the right.

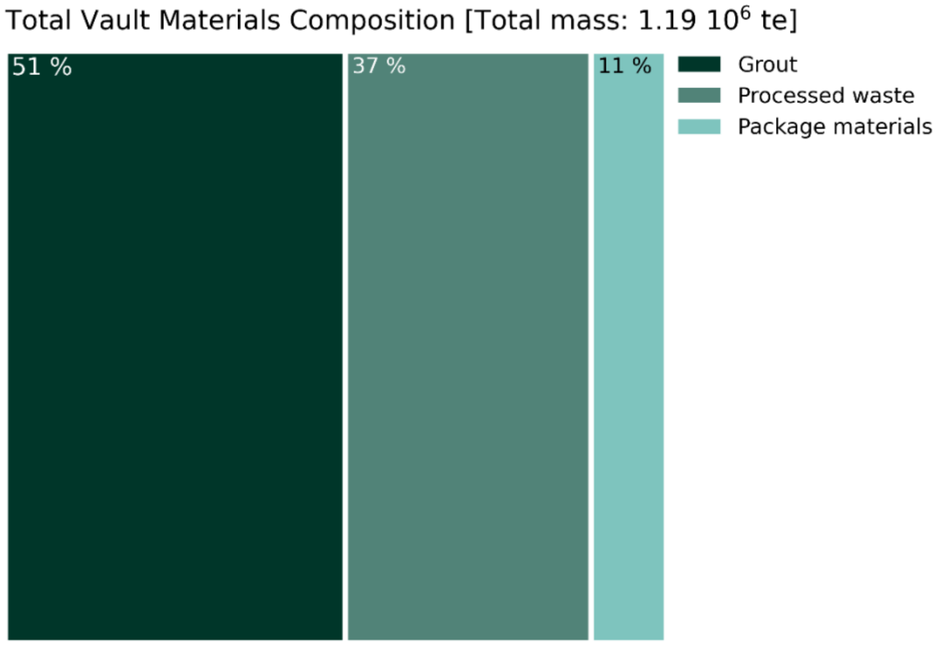


Figure 6.8: Material composition of waste in the vaults for the LLW-only inventory (top) and combined LLW and ILW vault inventory (bottom)

6.4 Non-radiological Contaminants

Historically, there has not been as great an emphasis on the characterisation for non-radiological contaminants as for their radiological counterparts. Efforts are ongoing across the nuclear industry to improve the quality and quantity of information for non-radiological contaminants for future wastes. The non-radiological contaminants presented in the Reference Inventory are based on as-reported data for both the Disposed and Reference Forward Inventories, material masses are in Appendix A6 for the LLW inventory and Appendix B6 for the combined LLW and ILW inventory. The HRA derives a non-radiological inventory based on that presented in the Reference Inventory, using fingerprints of non-radiological contaminants for non-radiological contaminants that have been determined as requiring assessment. Details of this derivation are given in reference [36].

6.5 Uncertainty

Table 6.3 presents a summary of the uncertainties in the Reference Inventory that have been discussed throughout this report (see table for cross references to associated Sections). The uncertainties identified across trench, disposed, and forward inventories are multifaceted but manageable within the framework of the ESC. Most uncertainties will be managed and reduced through waste characterisation and the application of WAC. The current level of understanding is sufficient to underpin ESC assessments. All aspects of the ESC are kept under active review and we would assess the impact of any changes as they arise, in accordance with established processes for managing the 'live' ESC.

Table 6.3: Summary of uncertainties in the Reference Inventory

Inventory Area	Uncertainty Source	Description
Trench Inventory (Subsection 3.3)	Data Gaps	Gaps in consignment records require use of analogous waste streams, introducing uncertainty in volume, radiological fingerprints, and material composition.
	Characterisation	Estimates of radionuclide inventories are based on uncertain measurements and assumptions, with lower uncertainty in more recent disposals.
	Radionuclide Composition	Dominance of short-lived radionuclides (tritium, Cs-137, Pu-241) results in variability; inventories may vary by up to an order of magnitude.
Disposed Inventory (Subsection 4.3)	Pre-2018 Data	Reliance on estimation techniques and material fingerprints for older consignments; less robust than post-2018 data.

Inventory Area	Uncertainty Source	Description
	Non-radiological Contaminants	Data only available from 2016 onwards; estimates of non-radiological contaminants for older consignments not made in the Reference Inventory.
Reference Forward Inventory (Subsection 5.5)	Receipt Rate	Forecasted LLW receipt rates likely overestimated; the forecasted container receipts significantly exceed actual site receipts.
	Radionuclide Activity	Future waste activity estimates vary widely (uncertainty factors 1.5 to 1,000); refinement expected through characterisation.
	Waste Routing	Potential loss of treatment/diversion routes could increase LLWR disposal volumes; VLLW landfill capacity critical.
	Strategic Changes	Reactor lifetime extensions and NNB programme introduce minor to moderate uncertainty in future waste volumes.
	Container Design	Delay in ISO container transition may reduce vault efficiency; impact considered minimal.
	ILW Inclusion	Compatibility and transport constraints may limit disposal of ILW streams included in the Reference Inventory.

6.6 Key Differences with 2011 ESC

The improvements since the 2011 ESC which have affected inventory development are outlined in Subsection 2.5. In this section, we discuss how these improvements have affected the Reference Inventory compared with the inventory used in the 2011 ESC. As discussed in Section 3, the trench inventory is unchanged from the 2011 ESC and will not be discussed further in this section.

One of the significant improvements since 2011 is the increase in diversion of waste to treatment and other disposal routes, decreasing the volume of waste expected to be disposed to the LLWR. In 2011, it was expected that a total processed volume (Disposed plus Reference Forward Inventory) of 8.5 10^5 m^3 LLW could be disposed to the LLWR vaults. This would fill the planned vaults at the time up to Vault 14, covering disposals up to 2080 (5.7 10^5 m^3 processed waste), and would require additional vaults for the remaining waste.

The 2026 ESC Reference Inventory only requires up to Vault 12 to dispose of a total processed volume (Disposed plus Reference Forward Inventory) in the vaults of 2.6 10^5 m^3 LLW, and 2.7 10^4 m^3 ILW (if a decision is made to dispose ILW). A comparison of the forward wastes in the Reference Inventory and the forecast arisings from 2022 in the 2011 ESC is given in Figure 6.9.

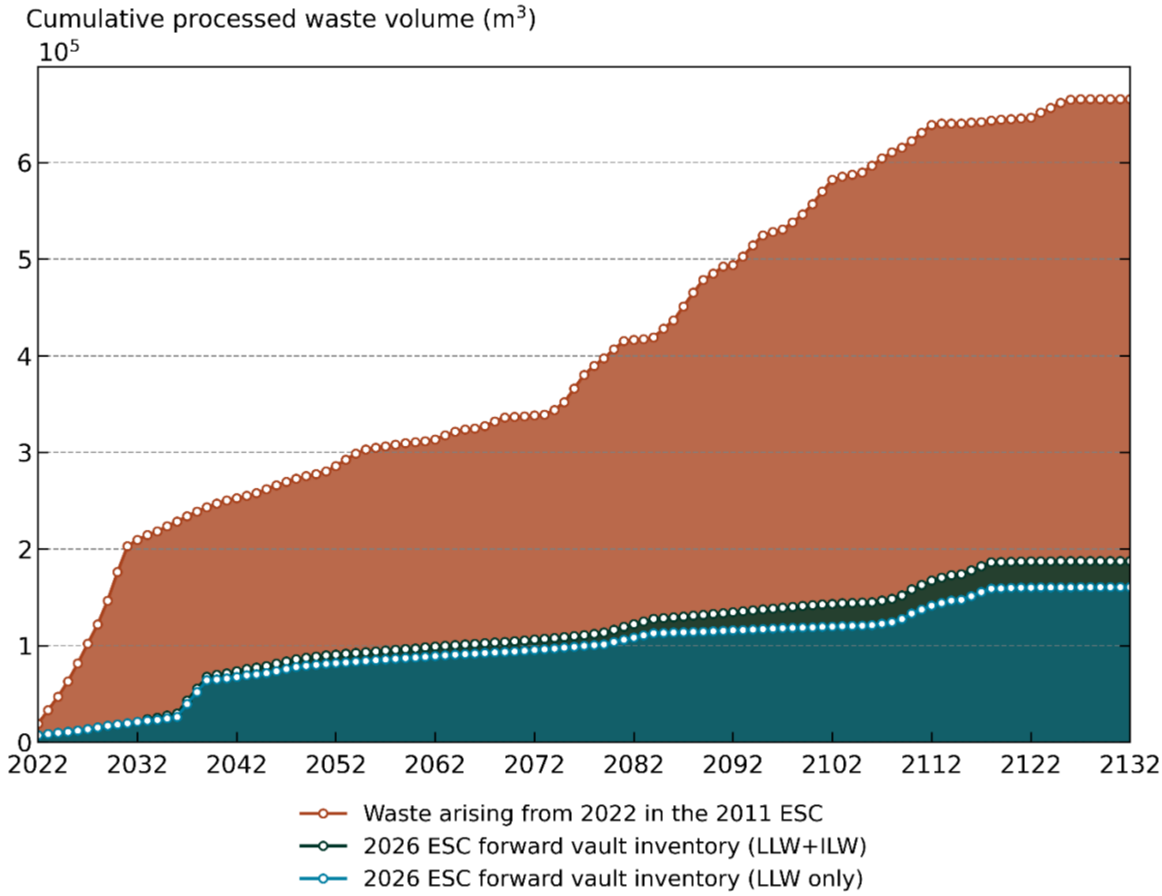
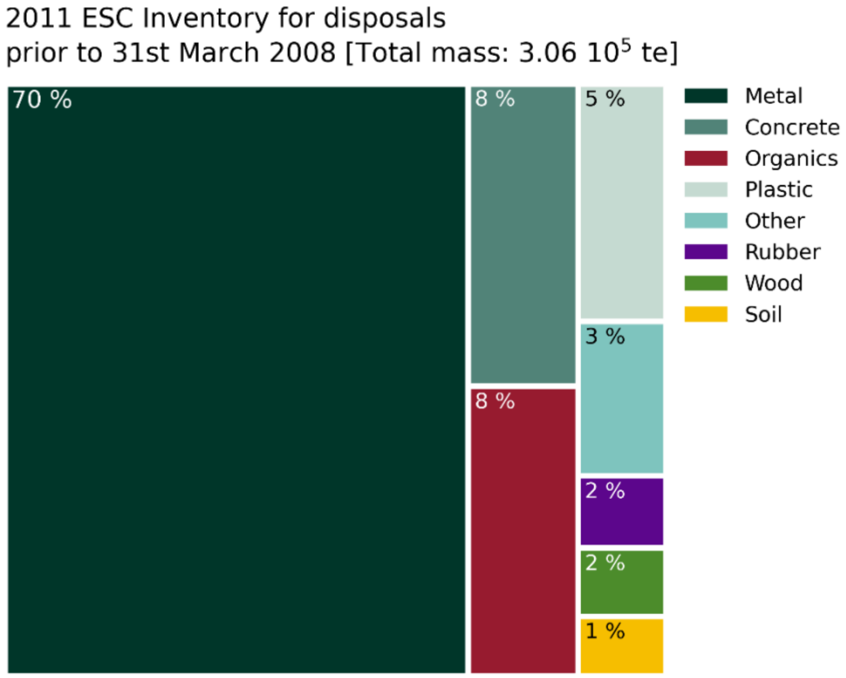


Figure 6.9: A comparison of forecast processed waste arisings from 2022 in the 2011 ESC and the Reference Inventory

Diversion of waste away from the LLWR has also had an impact on the breakdown of materials in the Reference Inventory. For example, due to metals treatment the proportion of metals in the Reference Inventory has decreased compared to 2011, as can be seen in Figure 6.10.



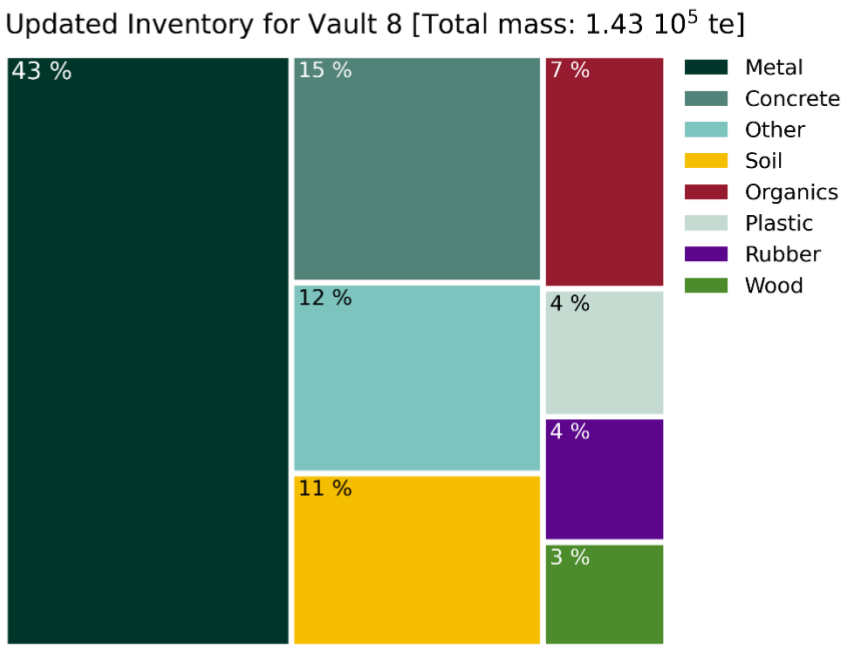


Figure 6.10: Comparison of material compositions in Vault 8 in the 2011 ESC and disposals to Vault 8 up to 2022 in the rederived dataset

The disposed and forward activity to the vaults at the time of the 2011 ESC was anticipated to be 1,250 TBq. The total vault activity of LLW in the Reference inventory is 1,950 TBq, which highlights that although waste volumes are decreasing the activity concentration of waste is increasing. This is likely due to a combination of factors such as increased diversion of LLW (e.g. metal treatment) leaving smaller portions of waste with higher activity concentrations to be routed to the LLW Repository, and the inclusion of ILW opportunity wastes for disposal as LLW. As the site volumetric capacity is no longer expected to be fully used, the limiting factor is now the radiological capacity. If a decision is made to accept ILW, a further 15,000 TBq of waste could be disposed to the vaults.

The potentially important radionuclides for assessments are similar to those identified in the 2011 ESC, with Co-60, Cs-137, H-3 and Nb-94 identified as additional potentially important radionuclides. The largest amounts of C-14, Cl-36, I-129, Pu-239 and Pu-240 are still expected to arise in the forward inventory, with a slightly smaller total inventory. There is much less Tc-99, Ra-226 and Th-232 expected in the LLW Forward Inventory now than in 2011. It was expected in the 2011 ESC that each of these had high levels of uncertainty in the fingerprints used for the estimates and that the actual amounts could be reduced by 2 to 3 orders of magnitude. U-238 also has significantly less activity in the LLW Forward Inventory than in 2011, which was noted at the time as a cautious upper estimate.

7 References

[1] Nuclear Waste Services, "2026 Environmental Safety Case for the LLWR: Main Report," LLWR/ESC/R(26)10166, May 2026.

[2] Nuclear Waste Services, "2026 Environmental Safety Case for the LLWR: Management and Dialogue," LLWR/ESC/R(26)10167, May 2026.

[3] Nuclear Waste Services, "2026 Environmental Safety Case for the LLWR: Site History and Description," LLWR/ESC/R(26)10168, May 2026.

[4] Nuclear Waste Services, "2026 Environmental Safety Case for the LLWR: Engineering Design," LLWR/ESC/R(26)10170, May 2026.

[5] Nuclear Waste Services, "2026 Environmental Safety Case for the LLWR: Near Field," LLWR/ESC/R(26)10171, May 2026.

[6] Nuclear Waste Services, "2026 Environmental Safety Case for the LLWR: Hydrogeology," LLWR/ESC/R(26)10172, May 2026.

[7] Nuclear Waste Services, "2026 Environmental Safety Case for the LLWR: Site Evolution," LLWR/ESC/R(26)10173, May 2026.

[8] Nuclear Waste Services, "2026 Environmental Safety Case for the LLWR: Monitoring," LLWR/ESC/R(26)10174, May 2026.

[9] Nuclear Waste Services, "2026 Environmental Safety Case for the LLWR: Optimisation and Site Development Plan," LLWR/ESC/R(26)10175, May 2026.

[10] Nuclear Waste Services, "2026 Environmental Safety Case for the LLWR: Waste Management Plan," LLWR/ESC/R(26)10176, May 2026.

[11] Nuclear Waste Services, "2026 Environmental Safety Case for the LLWR: Safety Functions," LLWR/ESC/R(26)10177, May 2026.

[12] Nuclear Waste Services, "2026 Environmental Safety Case for the LLWR: Engineering Performance Assessment," LLWR/ESC/R(26)10178, May 2026.

[13] Nuclear Waste Services, "2026 Environmental Safety Case for the LLWR: Environmental Safety During the Period of Authorisation," LLWR/ESC/R(26)10179, May 2026.

[14] Nuclear Waste Services, "2026 Environmental Safety Case for the LLWR: Assessment of Long-term Radiological Impacts," LLWR/ESC/R(26)10180, May 2026.

[15] Nuclear Waste Services, "2026 Environmental Safety Case for the LLWR: Hydrogeological Risk Assessment," LLWR/ESC/R(26)10181, May 2026.

[16] Nuclear Waste Services, "2026 Environmental Safety Case for the LLWR: Assessment of Radiological Impacts on Non-human Biota," LLWR/ESC/R(26)10182, May 2026.

[17] Nuclear Waste Services, "2026 Environmental Safety Case for the LLWR: Implementation," LLWR/ESC/R(26)10183, May 2026.

[18] Nuclear Waste Services, "2026 Environmental Safety Case for the LLWR: Addressing Regulatory Requirements and Feedback," LLWR/ESC/R(26)10184, May 2026.

[19] Environment Agency, Northern Ireland Environment Agency, Scottish Environment Protection Agency, "Near-surface Disposal Facilities on Land for Solid Radioactive Wastes: Guidance on Requirements for Authorisation," February 2009.

[20] Scottish Environment Protection Agency, Environment Agency and Natural Resources Wales, "Management of Radioactive Waste from Decommissioning of Nuclear Sites: Guidance on Requirements for Release from Radioactive Substances Regulation," Version 1.0, July 2018.

[21] NDA, "2022 UK Radioactive Waste Inventory," April 2022.

[22] UK Government, "UK Policy Framework for Managing Radioactive Substances and Nuclear Decommissioning," May 2024.

[23] LLW Repository Ltd, "Trench Inventory Methodology," LLWR/WI&C(20)004, October 2020.

[24] Nuclear Waste Services, "2026 Environmental Safety Case: The Disposed Vault Inventory at the LLWR," In preparation, 2025.

[25] Nuclear Waste Services, "Low Level Waste Repository Environmental Safety Case 2026 Environmental Safety Case: The Forward Inventory Methodology," NWS/EIO-2026-003, April 2026.

[26] Nuclear Waste Services, "Low Level Waste Repository Environmental Safety Case 2026 Environmental Safety Case: The Stage 2 Reference Inventory Key Assumptions and Results," NWS/EIO-2026-004, April 2026.

[27] LLW Repository Ltd, "The 2011 Environmental Safety Case: Inventory," LLWR/ESC/R(11)10019, May 2011.

[28] LLW Repository Ltd, "2016 UKRWI Enhancement Project," 2019.

[29] BNFL, "Status Report on the Development of the 2002 Drigg Post-Closure Safety Case," March 2000.

[30] BNFL, "Drigg Post-Closure Safety Case: Inventory of Past and Potential Future Disposals," September 2002.

[31] A. S. Wareing, L. Eden, A. Jones and M. Ball, "LLWR Lifetime Project: The Inventory of Past and Potential Future Disposals at the LLWR," Nexia Solutions (07) 9124, Issue 03, April 2008.

[32] LLW Repository Ltd, "ESC 2011: The Disposed and Forward Inventory of LLWR," SERCO/E003756/12, Issue 2, April 2011.

[33] LLW Repository Ltd, "Further Review of RECALL Work," LLWR/ESC/R(18)10095, March 2018.

[34] LLW Repository Ltd, "Assessment of Discrete Items and Active Particles in Stored and Disposed Waste at the LLWR," LLWR/ESC/R(16)10074 Issue 2, March 2016.

[35] LLW Repository Ltd, "The 2011 Environmental Safety Case: Assessment of Non-radiological Impacts," LLWR/ESC/R(11)10029, May 2011.

[36] Amentum, "Non-radiological Assessment of the Groundwater Pathway for the LLWR 2026 ESC," DEPSCD27-TR-004, Revision 2, April 2026.

[37] National Nuclear Laboratory, "Methodology for the 2018 Re-derivation of the Disposed Vault Inventory at the LLWR," UKNNL 14928, June 2023.

[38] Scottish Government, "Scotland's Higher Activity Radioactive Waste Policy 2011," DPPAS11098 (01/11), January 2011.

[39] National Energy System Operator, "Future Energy Scenarios: Pathways to Net Zero," V.5, November 2025.

[40] Eadon Consulting Ltd, "Stronger Containers Technical Memorandum," Document No R3375-010, September 2022.

[41] Nuclear Waste Services, "Evaluation of Near-surface Disposal Options: Assessments and Inventory Constraints," LLWR/ESC/R(23)10142, August 2023.

[42] Nuclear Waste Services, "Interim Constraints for Stage 3 Inventory Derivation," Inventory Constraints July 2025 Version 3+aej2.xlsx, April 2026.

[43] Nuclear Waste Services, "Stage 1 Inventory: Disposed Radionuclides/Activity," DMF0107 v1 (Excel file), April 2024.

[44] Nuclear Waste Services, "Stage 1 Inventory: Masses of Disposed Materials and Non-radiological Contaminants," DMF0108 v1 (Excel file), April 2024.

[45] Nuclear Waste Services, "Stage 1 Inventory: Volumes of Disposed Waste," DMF0109 v1 (Excel file), April 2024.

[46] Nuclear Waste Services, "Stage 1 Inventory: Future Radionuclide/Activity Disposals," DMF0110 v1 (Excel file), April 2024.

[47] Nuclear Waste Services, "Stage 1 Inventory: Masses of Future Materials and Non-radiological Contaminants," DMF0111 v1 (Excel file), April 2024.

[48] Nuclear Waste Services, "Stage 1 Inventory: Volumes of Future Waste," DMF0112 v1 (Excel file), April 2024.

[49] F. Taylor, "Waste Types of Electronic and Electrical Equipment (EEE): Determination of Material Fingerprints," LLWR/ESC/Mem(18)343, December 2019.

Appendix A: Reference Inventory Data (Stage 3) - LLW only

This appendix presents the detailed inventory data for Stage 3 for the trenches, disposed and forward vaults considering only LLW disposals.

A1 Radionuclides

Table A.1: Total activity at the time of disposal of radionuclides in the trenches

Radionuclide	Activity (TBq)							
	Trench 1	Trench 2	Trench 3	Trench 4	Trench 5	Trench 6	Trench 7	TOTAL
Ac-227	0	$3.03\ 10^{-19}$	0	0	0	0	0	$3.03\ 10^{-19}$
Ag-108m	$8.21\ 10^{-8}$	$3.60\ 10^{-7}$	$2.70\ 10^{-6}$	$3.87\ 10^{-6}$	$2.18\ 10^{-6}$	$5.08\ 10^{-6}$	$1.03\ 10^{-5}$	$2.45\ 10^{-5}$
Ag-110m	$4.20\ 10^{-5}$	$1.28\ 10^{-4}$	$2.61\ 10^{-4}$	$3.90\ 10^{-4}$	$4.16\ 10^{-4}$	$5.77\ 10^{-4}$	$5.66\ 10^{-4}$	$2.38\ 10^{-3}$
Am-241	$2.35\ 10^{-2}$	$6.24\ 10^{-2}$	$6.68\ 10^{-2}$	$2.14\ 10^{-1}$	$6.95\ 10^{-2}$	$5.83\ 10^{-2}$	$1.24\ 10^{-1}$	$6.19\ 10^{-1}$
Am-242m	$2.39\ 10^{-4}$	$1.55\ 10^{-3}$	$7.49\ 10^{-4}$	$6.08\ 10^{-4}$	$6.03\ 10^{-4}$	$1.01\ 10^{-3}$	$1.39\ 10^{-3}$	$6.14\ 10^{-3}$
Am-243	$3.54\ 10^{-6}$	$8.89\ 10^{-6}$	$9.15\ 10^{-6}$	$4.50\ 10^{-6}$	$2.60\ 10^{-6}$	$6.02\ 10^{-6}$	$2.97\ 10^{-5}$	$6.44\ 10^{-5}$
Ba-133	$3.34\ 10^{-4}$	$7.14\ 10^{-4}$	$1.00\ 10^{-3}$	$6.26\ 10^{-4}$	$6.27\ 10^{-4}$	$8.97\ 10^{-4}$	$1.22\ 10^{-3}$	$5.42\ 10^{-3}$
Be-10	0	$5.29\ 10^{-16}$	0	0	0	0	0	$5.29\ 10^{-16}$

Radionuclide	Activity (TBq)							
	Trench 1	Trench 2	Trench 3	Trench 4	Trench 5	Trench 6	Trench 7	TOTAL
C-14	$5.87\ 10^{-3}$	$1.23\ 10^{-2}$	$2.04\ 10^{-2}$	$1.36\ 10^{-2}$	$1.54\ 10^{-2}$	$1.59\ 10^{-2}$	$1.64\ 10^{-2}$	$9.98\ 10^{-2}$
Ca-41	$2.47\ 10^{-4}$	$2.98\ 10^{-4}$	$1.06\ 10^{-3}$	$1.00\ 10^{-3}$	$1.30\ 10^{-3}$	$1.04\ 10^{-3}$	$6.28\ 10^{-4}$	$5.58\ 10^{-3}$
Ca-45	$4.56\ 10^{-6}$	$1.44\ 10^{-4}$	$4.29\ 10^{-4}$	$3.93\ 10^{-4}$	$3.48\ 10^{-4}$	$4.09\ 10^{-4}$	$3.38\ 10^{-4}$	$2.07\ 10^{-3}$
Cd-109	$1.64\ 10^{-5}$	$2.05\ 10^{-4}$	$3.68\ 10^{-4}$	$5.23\ 10^{-4}$	$6.78\ 10^{-4}$	$9.50\ 10^{-4}$	$7.27\ 10^{-4}$	$3.47\ 10^{-3}$
Cd-113m	$1.04\ 10^{-10}$	$1.42\ 10^{-9}$	$4.47\ 10^{-10}$	$2.23\ 10^{-10}$	$1.57\ 10^{-10}$	$2.60\ 10^{-10}$	$2.74\ 10^{-10}$	$2.89\ 10^{-9}$
Ce-141	$9.01\ 10^{-5}$	$2.02\ 10^{-4}$	$2.22\ 10^{-4}$	$8.77\ 10^{-5}$	$4.90\ 10^{-5}$	$1.33\ 10^{-4}$	$3.10\ 10^{-4}$	$1.09\ 10^{-3}$
Ce-144	$6.55\ 10^{-2}$	$1.49\ 10^{-1}$	$1.64\ 10^{-1}$	$6.65\ 10^{-2}$	$3.78\ 10^{-2}$	$1.00\ 10^{-1}$	$4.63\ 10^{-1}$	$1.05\ 10^{0}$
Cf-249	$1.70\ 10^{-9}$	$1.28\ 10^{-9}$	$1.28\ 10^{-10}$	$1.50\ 10^{-10}$	$6.40\ 10^{-11}$	$3.92\ 10^{-10}$	$3.79\ 10^{-9}$	$7.50\ 10^{-9}$
Cf-250	$5.02\ 10^{-8}$	$1.32\ 10^{-8}$	$8.94\ 10^{-10}$	$3.54\ 10^{-9}$	$3.09\ 10^{-10}$	$1.12\ 10^{-9}$	$4.18\ 10^{-9}$	$7.35\ 10^{-8}$
Cf-251	$1.95\ 10^{-8}$	$9.58\ 10^{-8}$	$3.94\ 10^{-7}$	$2.04\ 10^{-7}$	$2.20\ 10^{-7}$	$3.27\ 10^{-7}$	$2.53\ 10^{-7}$	$1.51\ 10^{-6}$
Cf-252	$5.15\ 10^{-7}$	$2.70\ 10^{-6}$	$6.82\ 10^{-6}$	$3.27\ 10^{-6}$	$3.24\ 10^{-6}$	$4.87\ 10^{-6}$	$3.86\ 10^{-6}$	$2.53\ 10^{-5}$
Cl-36	$7.21\ 10^{-5}$	$3.44\ 10^{-4}$	$1.57\ 10^{-3}$	$2.78\ 10^{-3}$	$3.78\ 10^{-3}$	$5.59\ 10^{-3}$	$4.34\ 10^{-3}$	$1.85\ 10^{-2}$
Cm-242	$9.12\ 10^{-5}$	$8.09\ 10^{-4}$	$5.11\ 10^{-4}$	$2.25\ 10^{-4}$	$6.36\ 10^{-5}$	$1.75\ 10^{-4}$	$3.23\ 10^{-3}$	$5.10\ 10^{-3}$

Radionuclide	Activity (TBq)							
	Trench 1	Trench 2	Trench 3	Trench 4	Trench 5	Trench 6	Trench 7	TOTAL
Cm-243	$2.44\ 10^{-5}$	$3.35\ 10^{-4}$	$2.00\ 10^{-4}$	$8.98\ 10^{-5}$	$2.22\ 10^{-5}$	$4.54\ 10^{-5}$	$8.32\ 10^{-5}$	$8.00\ 10^{-4}$
Cm-244	$2.43\ 10^{-4}$	$7.70\ 10^{-4}$	$7.51\ 10^{-4}$	$3.39\ 10^{-4}$	$1.82\ 10^{-4}$	$4.52\ 10^{-4}$	$1.91\ 10^{-3}$	$4.65\ 10^{-3}$
Cm-245	$6.81\ 10^{-8}$	$1.53\ 10^{-7}$	$1.68\ 10^{-7}$	$6.63\ 10^{-8}$	$3.70\ 10^{-8}$	$1.01\ 10^{-7}$	$8.01\ 10^{-7}$	$1.39\ 10^{-6}$
Cm-246	$6.81\ 10^{-8}$	$1.53\ 10^{-7}$	$1.68\ 10^{-7}$	$6.62\ 10^{-8}$	$3.69\ 10^{-8}$	$1.00\ 10^{-7}$	$2.42\ 10^{-7}$	$8.34\ 10^{-7}$
Cm-248	$6.38\ 10^{-8}$	$3.40\ 10^{-7}$	$1.41\ 10^{-6}$	$3.24\ 10^{-7}$	$1.42\ 10^{-7}$	$2.11\ 10^{-7}$	$1.61\ 10^{-7}$	$2.66\ 10^{-6}$
Co-57	$1.09\ 10^{-3}$	$2.58\ 10^{-3}$	$3.45\ 10^{-3}$	$2.56\ 10^{-3}$	$2.77\ 10^{-3}$	$4.80\ 10^{-3}$	$6.12\ 10^{-3}$	$2.34\ 10^{-2}$
Co-58	$3.19\ 10^{-3}$	$7.21\ 10^{-3}$	$7.87\ 10^{-3}$	$3.11\ 10^{-3}$	$1.73\ 10^{-3}$	$4.69\ 10^{-3}$	$1.09\ 10^{-2}$	$3.87\ 10^{-2}$
Co-60	$9.77\ 10^{-2}$	$2.34\ 10^{-1}$	$2.88\ 10^{-1}$	$1.57\ 10^{-1}$	$1.32\ 10^{-1}$	$2.03\ 10^{-1}$	$5.41\ 10^{-1}$	$1.65\ 10^{0}$
Cr-51	$3.24\ 10^{-4}$	$2.85\ 10^{-3}$	$1.44\ 10^{-3}$	$7.88\ 10^{-4}$	$2.00\ 10^{-4}$	$5.97\ 10^{-4}$	$8.77\ 10^{-4}$	$7.08\ 10^{-3}$
Cs-134	$9.86\ 10^{-3}$	$2.30\ 10^{-2}$	$2.65\ 10^{-2}$	$1.32\ 10^{-2}$	$8.42\ 10^{-3}$	$1.91\ 10^{-2}$	$2.52\ 10^{-1}$	$3.52\ 10^{-1}$
Cs-135	0	$1.27\ 10^{-13}$	0	0	0	0	0	$1.27\ 10^{-13}$
Cs-137	$7.80\ 10^{-1}$	$1.81\ 10^{0}$	$2.15\ 10^{0}$	$2.44\ 10^{0}$	$1.07\ 10^{0}$	$1.53\ 10^{0}$	$6.19\ 10^{0}$	$1.60\ 10^{1}$
Es-254	$5.67\ 10^{-10}$	$4.27\ 10^{-10}$	$4.26\ 10^{-11}$	$4.98\ 10^{-11}$	$2.13\ 10^{-11}$	$1.31\ 10^{-10}$	$1.26\ 10^{-9}$	$2.50\ 10^{-9}$

Radionuclide	Activity (TBq)							
	Trench 1	Trench 2	Trench 3	Trench 4	Trench 5	Trench 6	Trench 7	TOTAL
Eu-152	$7.88\ 10^{-3}$	$9.81\ 10^{-3}$	$3.39\ 10^{-2}$	$3.24\ 10^{-2}$	$4.22\ 10^{-2}$	$3.46\ 10^{-2}$	$2.08\ 10^{-2}$	$1.81\ 10^{-1}$
Eu-154	$3.35\ 10^{-3}$	$7.13\ 10^{-3}$	$9.97\ 10^{-3}$	$6.28\ 10^{-3}$	$5.75\ 10^{-3}$	$7.97\ 10^{-3}$	$1.72\ 10^{-2}$	$5.76\ 10^{-2}$
Eu-155	$7.09\ 10^{-4}$	$1.79\ 10^{-3}$	$1.88\ 10^{-3}$	$8.80\ 10^{-4}$	$5.12\ 10^{-4}$	$1.28\ 10^{-3}$	$7.04\ 10^{-3}$	$1.41\ 10^{-2}$
Fe-55	$1.94\ 10^{-2}$	$5.24\ 10^{-2}$	$1.01\ 10^{-1}$	$8.63\ 10^{-2}$	$8.05\ 10^{-2}$	$9.20\ 10^{-2}$	$1.36\ 10^{-1}$	$5.68\ 10^{-1}$
Fe-59	$1.14\ 10^{-4}$	$2.66\ 10^{-4}$	$2.88\ 10^{-4}$	$1.24\ 10^{-4}$	$7.35\ 10^{-5}$	$1.75\ 10^{-4}$	$5.51\ 10^{-3}$	$6.55\ 10^{-3}$
Gd-153	$2.62\ 10^{-6}$	$1.61\ 10^{-5}$	$2.29\ 10^{-5}$	$4.20\ 10^{-5}$	$5.91\ 10^{-5}$	$8.84\ 10^{-5}$	$6.90\ 10^{-5}$	$3.00\ 10^{-4}$
H-3	$3.53\ 10^{-2}$	$8.61\ 10^{-2}$	$3.24\ 10^{1}$	$1.67\ 10^{1}$	$5.78\ 10^{0}$	$4.47\ 10^{2}$	$3.27\ 10^{-1}$	$5.02\ 10^{2}$
Hg-203	$2.38\ 10^{-6}$	$5.33\ 10^{-6}$	$5.86\ 10^{-6}$	$2.33\ 10^{-6}$	$1.32\ 10^{-6}$	$3.55\ 10^{-6}$	$8.17\ 10^{-6}$	$2.89\ 10^{-5}$
Ho-166m	0	0	0	0	0	$2.96\ 10^{-10}$	$2.29\ 10^{-7}$	$2.29\ 10^{-7}$
I-125	$9.38\ 10^{-8}$	$4.99\ 10^{-7}$	$2.06\ 10^{-6}$	$1.15\ 10^{-6}$	$1.29\ 10^{-6}$	$1.92\ 10^{-6}$	$1.47\ 10^{-6}$	$8.48\ 10^{-6}$
I-129	$2.28\ 10^{-4}$	$5.07\ 10^{-4}$	$5.72\ 10^{-4}$	$2.44\ 10^{-4}$	$1.54\ 10^{-4}$	$3.56\ 10^{-4}$	$8.90\ 10^{-4}$	$2.95\ 10^{-3}$
Ir-192	$2.08\ 10^{-6}$	$1.11\ 10^{-5}$	$4.60\ 10^{-5}$	$2.37\ 10^{-5}$	$2.55\ 10^{-5}$	$3.79\ 10^{-5}$	$2.90\ 10^{-5}$	$1.75\ 10^{-4}$
K-40	$3.08\ 10^{-6}$	$4.19\ 10^{-5}$	$6.02\ 10^{-5}$	$3.47\ 10^{-5}$	$2.44\ 10^{-5}$	$1.50\ 10^{-5}$	$7.45\ 10^{-5}$	$2.54\ 10^{-4}$

Radionuclide	Activity (TBq)							
	Trench 1	Trench 2	Trench 3	Trench 4	Trench 5	Trench 6	Trench 7	TOTAL
Kr-85	$3.54\ 10^{-4}$	$1.32\ 10^{-3}$	$1.66\ 10^{-3}$	$8.31\ 10^{-4}$	$5.53\ 10^{-4}$	$1.04\ 10^{-3}$	$1.66\ 10^{-3}$	$7.42\ 10^{-3}$
Mn-54	$2.37\ 10^{-3}$	$6.40\ 10^{-3}$	$7.10\ 10^{-3}$	$3.76\ 10^{-3}$	$2.39\ 10^{-3}$	$4.55\ 10^{-3}$	$1.88\ 10^{-2}$	$4.54\ 10^{-2}$
Mo-93	$4.13\ 10^{-9}$	$5.09\ 10^{-9}$	$1.76\ 10^{-8}$	$1.67\ 10^{-8}$	$2.17\ 10^{-8}$	$1.73\ 10^{-8}$	$7.75\ 10^{-9}$	$9.02\ 10^{-8}$
Na-22	$9.14\ 10^{-6}$	$5.27\ 10^{-5}$	$1.75\ 10^{-4}$	$4.04\ 10^{-4}$	$5.94\ 10^{-4}$	$8.83\ 10^{-4}$	$6.76\ 10^{-4}$	$2.79\ 10^{-3}$
Nb-93m	0	$1.85\ 10^{-13}$	0	0	0	$3.53\ 10^{-6}$	$5.52\ 10^{-4}$	$5.56\ 10^{-4}$
Nb-94	$6.33\ 10^{-7}$	$1.27\ 10^{-5}$	$1.70\ 10^{-5}$	$9.91\ 10^{-6}$	$7.03\ 10^{-6}$	$5.07\ 10^{-6}$	$2.69\ 10^{-5}$	$7.92\ 10^{-5}$
Nb-95	$5.85\ 10^{-3}$	$1.33\ 10^{-2}$	$1.45\ 10^{-2}$	$5.91\ 10^{-3}$	$3.37\ 10^{-3}$	$9.00\ 10^{-3}$	$3.08\ 10^{-2}$	$8.28\ 10^{-2}$
Ni-59	$6.58\ 10^{-6}$	$3.97\ 10^{-5}$	$2.84\ 10^{-5}$	$1.52\ 10^{-5}$	$1.18\ 10^{-5}$	$1.75\ 10^{-5}$	$5.85\ 10^{-5}$	$1.78\ 10^{-4}$
Ni-63	$1.53\ 10^{-2}$	$3.50\ 10^{-2}$	$4.17\ 10^{-2}$	$2.18\ 10^{-2}$	$1.46\ 10^{-2}$	$2.94\ 10^{-2}$	$7.40\ 10^{-2}$	$2.32\ 10^{-1}$
Np-237	$3.79\ 10^{-3}$	$4.35\ 10^{-3}$	$2.33\ 10^{-3}$	$1.17\ 10^{-3}$	$6.26\ 10^{-4}$	$1.98\ 10^{-3}$	$1.22\ 10^{-2}$	$2.65\ 10^{-2}$
OA	$1.14\ 10^{-8}$	$2.91\ 10^{-8}$	$8.62\ 10^{-4}$	$3.66\ 10^{-2}$	$9.58\ 10^{-3}$	$2.70\ 10^{-3}$	$8.28\ 10^{-6}$	$4.97\ 10^{-2}$
OBG	$1.37\ 10^{-5}$	$3.62\ 10^{-5}$	$3.90\ 10^{-2}$	$1.65\ 10^{0}$	$4.33\ 10^{-1}$	$1.22\ 10^{-1}$	$1.08\ 10^{-2}$	$2.26\ 10^{0}$
P-33	$6.58\ 10^{-8}$	$3.50\ 10^{-7}$	$1.46\ 10^{-6}$	$1.15\ 10^{-6}$	$1.45\ 10^{-6}$	$2.15\ 10^{-6}$	$1.64\ 10^{-6}$	$8.27\ 10^{-6}$

Radionuclide	Activity (TBq)							
	Trench 1	Trench 2	Trench 3	Trench 4	Trench 5	Trench 6	Trench 7	TOTAL
Pa-231	$1.48\ 10^{-5}$	$1.88\ 10^{-5}$	$5.79\ 10^{-6}$	$3.81\ 10^{-6}$	$2.34\ 10^{-6}$	$6.40\ 10^{-6}$	$3.83\ 10^{-5}$	$9.02\ 10^{-5}$
Pa-232	$4.39\ 10^{-8}$	$1.00\ 10^{-7}$	$1.09\ 10^{-7}$	$4.31\ 10^{-8}$	$2.43\ 10^{-8}$	$6.49\ 10^{-8}$	$1.49\ 10^{-7}$	$5.35\ 10^{-7}$
Pa-233	$4.64\ 10^{-7}$	$1.04\ 10^{-6}$	$1.14\ 10^{-6}$	$4.59\ 10^{-7}$	$2.57\ 10^{-7}$	$6.85\ 10^{-7}$	$1.63\ 10^{-6}$	$5.67\ 10^{-6}$
Pb-210	$1.16\ 10^{-4}$	$4.49\ 10^{-4}$	$6.37\ 10^{-4}$	$2.57\ 10^{-4}$	$3.07\ 10^{-4}$	$2.92\ 10^{-4}$	$1.66\ 10^{-4}$	$2.22\ 10^{-3}$
Pd-107	0	$2.04\ 10^{-14}$	0	0	0	0	0	$2.04\ 10^{-14}$
Pm-147	$6.25\ 10^{-3}$	$1.66\ 10^{-2}$	$2.02\ 10^{-2}$	$1.04\ 10^{-2}$	$7.49\ 10^{-3}$	$1.66\ 10^{-2}$	$7.20\ 10^{-2}$	$1.50\ 10^{-1}$
Po-210	$4.58\ 10^{-4}$	$8.95\ 10^{-4}$	$2.06\ 10^{-3}$	$1.67\ 10^{-3}$	$2.15\ 10^{-3}$	$1.86\ 10^{-3}$	$9.82\ 10^{-4}$	$1.01\ 10^{-2}$
Pu-236	$4.69\ 10^{-7}$	$1.05\ 10^{-6}$	$1.16\ 10^{-6}$	$4.76\ 10^{-7}$	$2.74\ 10^{-7}$	$7.07\ 10^{-7}$	$9.70\ 10^{-6}$	$1.38\ 10^{-5}$
Pu-238	$4.83\ 10^{-3}$	$4.32\ 10^{-2}$	$1.40\ 10^{-2}$	$7.90\ 10^{-2}$	$2.26\ 10^{-2}$	$1.32\ 10^{-2}$	$3.16\ 10^{-2}$	$2.08\ 10^{-1}$
Pu-239	$2.94\ 10^{-2}$	$1.07\ 10^{0}$	$7.62\ 10^{-2}$	$1.90\ 10^{-1}$	$6.08\ 10^{-2}$	$5.82\ 10^{-2}$	$1.26\ 10^{-1}$	$1.61\ 10^{0}$
Pu-240	$1.62\ 10^{-2}$	$3.49\ 10^{-1}$	$4.51\ 10^{-2}$	$2.28\ 10^{-1}$	$6.60\ 10^{-2}$	$4.10\ 10^{-2}$	$7.17\ 10^{-2}$	$8.17\ 10^{-1}$
Pu-241	$2.73\ 10^{-1}$	$1.12\ 10^{1}$	$6.95\ 10^{-1}$	$3.44\ 10^{-1}$	$2.00\ 10^{-1}$	$4.51\ 10^{-1}$	$1.47\ 10^{0}$	$1.46\ 10^{1}$
Pu-242	$8.77\ 10^{-6}$	$3.88\ 10^{-5}$	$1.97\ 10^{-5}$	$1.49\ 10^{-5}$	$1.20\ 10^{-5}$	$2.18\ 10^{-5}$	$4.19\ 10^{-5}$	$1.58\ 10^{-4}$

Radionuclide	Activity (TBq)							
	Trench 1	Trench 2	Trench 3	Trench 4	Trench 5	Trench 6	Trench 7	TOTAL
Ra-225	$3.50\ 10^{-10}$	$7.86\ 10^{-10}$	$8.99\ 10^{-10}$	$3.39\ 10^{-10}$	$1.89\ 10^{-10}$	$5.22\ 10^{-10}$	$6.86\ 10^{-8}$	$7.17\ 10^{-8}$
Ra-226	$1.02\ 10^{-3}$	$5.70\ 10^{-2}$	$2.20\ 10^{-1}$	$3.12\ 10^{-3}$	$3.65\ 10^{-3}$	$3.17\ 10^{-3}$	$1.96\ 10^{-3}$	$2.90\ 10^{-1}$
Ra-228	$4.31\ 10^{-6}$	$5.96\ 10^{-1}$	$5.19\ 10^{-1}$	$4.09\ 10^{-1}$	$3.67\ 10^{-1}$	$6.31\ 10^{-3}$	$8.38\ 10^{-6}$	$1.90\ 10^{0}$
Ru-103	$8.88\ 10^{-4}$	$2.11\ 10^{-3}$	$2.23\ 10^{-3}$	$9.00\ 10^{-4}$	$4.97\ 10^{-4}$	$1.32\ 10^{-3}$	$3.49\ 10^{-3}$	$1.14\ 10^{-2}$
Ru-106	$3.26\ 10^{-2}$	$7.43\ 10^{-2}$	$8.26\ 10^{-2}$	$4.78\ 10^{-2}$	$2.34\ 10^{-2}$	$5.25\ 10^{-2}$	$5.07\ 10^{-1}$	$8.21\ 10^{-1}$
S-35	$1.10\ 10^{-4}$	$7.46\ 10^{-4}$	$4.92\ 10^{-4}$	$4.22\ 10^{-4}$	$2.87\ 10^{-4}$	$4.69\ 10^{-4}$	$5.13\ 10^{-4}$	$3.04\ 10^{-3}$
Sb-124	$2.50\ 10^{-6}$	$5.61\ 10^{-6}$	$6.19\ 10^{-6}$	$2.55\ 10^{-6}$	$1.42\ 10^{-6}$	$3.83\ 10^{-6}$	$1.05\ 10^{-5}$	$3.26\ 10^{-5}$
Sb-125	$1.17\ 10^{-2}$	$2.66\ 10^{-2}$	$2.94\ 10^{-2}$	$1.19\ 10^{-2}$	$6.91\ 10^{-3}$	$1.78\ 10^{-2}$	$5.28\ 10^{-2}$	$1.57\ 10^{-1}$
Sc-46	$7.05\ 10^{-6}$	$1.75\ 10^{-5}$	$1.81\ 10^{-5}$	$7.20\ 10^{-6}$	$3.83\ 10^{-6}$	$1.04\ 10^{-5}$	$2.84\ 10^{-5}$	$9.25\ 10^{-5}$
Se-75	$6.11\ 10^{-6}$	$3.26\ 10^{-5}$	$1.50\ 10^{-4}$	$3.91\ 10^{-4}$	$5.85\ 10^{-4}$	$8.54\ 10^{-4}$	$6.37\ 10^{-4}$	$2.66\ 10^{-3}$
Se-79	0	$1.93\ 10^{-13}$	0	0	0	0	0	$1.93\ 10^{-13}$
Sm-151	$1.13\ 10^{-4}$	$3.34\ 10^{-4}$	$4.92\ 10^{-4}$	$3.49\ 10^{-4}$	$2.41\ 10^{-4}$	$3.43\ 10^{-4}$	$1.13\ 10^{-3}$	$3.00\ 10^{-3}$
Sn-113	$4.02\ 10^{-7}$	$2.46\ 10^{-6}$	$3.64\ 10^{-6}$	$3.80\ 10^{-6}$	$4.86\ 10^{-6}$	$7.30\ 10^{-6}$	$5.79\ 10^{-6}$	$2.82\ 10^{-5}$

Radionuclide	Activity (TBq)							
	Trench 1	Trench 2	Trench 3	Trench 4	Trench 5	Trench 6	Trench 7	TOTAL
Sn-119m	$1.07\ 10^{-8}$	$5.69\ 10^{-8}$	$2.37\ 10^{-7}$	$5.26\ 10^{-7}$	$7.74\ 10^{-7}$	$1.15\ 10^{-6}$	$8.79\ 10^{-7}$	$3.63\ 10^{-6}$
Sn-121m	0	$2.88\ 10^{-12}$	0	0	0	0	0	$2.88\ 10^{-12}$
Sn-126	0	$4.73\ 10^{-14}$	0	0	0	0	0	$4.73\ 10^{-14}$
Sr-85	$3.71\ 10^{-6}$	$2.38\ 10^{-5}$	$1.67\ 10^{-5}$	$1.06\ 10^{-5}$	$7.02\ 10^{-6}$	$1.13\ 10^{-5}$	$1.09\ 10^{-5}$	$8.40\ 10^{-5}$
Sr-89	$2.30\ 10^{-4}$	$5.16\ 10^{-4}$	$5.67\ 10^{-4}$	$2.27\ 10^{-4}$	$1.28\ 10^{-4}$	$3.40\ 10^{-4}$	$7.98\ 10^{-4}$	$2.81\ 10^{-3}$
Sr-90	$2.07\ 10^{-1}$	$4.81\ 10^{-1}$	$5.57\ 10^{-1}$	$3.39\ 10^{-1}$	$1.95\ 10^{-1}$	$3.99\ 10^{-1}$	$1.46\ 10^{0}$	$3.64\ 10^{0}$
Ta-182	$6.03\ 10^{-11}$	$1.35\ 10^{-10}$	$6.31\ 10^{-8}$	$1.70\ 10^{-7}$	$9.32\ 10^{-8}$	$2.69\ 10^{-7}$	$4.80\ 10^{-7}$	$1.08\ 10^{-6}$
Tc-99	$3.39\ 10^{-2}$	$2.88\ 10^{-2}$	$2.54\ 10^{-2}$	$1.19\ 10^{-2}$	$6.05\ 10^{-3}$	$1.58\ 10^{-2}$	$8.33\ 10^{-2}$	$2.05\ 10^{-1}$
Te-125m	$1.74\ 10^{-5}$	$3.89\ 10^{-5}$	$4.28\ 10^{-5}$	$1.77\ 10^{-5}$	$9.90\ 10^{-6}$	$4.58\ 10^{-5}$	$5.27\ 10^{-4}$	$6.99\ 10^{-4}$
Th-228	$3.43\ 10^{-5}$	$4.65\ 10^{-1}$	$1.11\ 10^{-4}$	$4.09\ 10^{-1}$	$3.67\ 10^{-1}$	$6.36\ 10^{-3}$	$1.11\ 10^{-4}$	$1.25\ 10^{0}$
Th-229	$7.64\ 10^{-8}$	$1.71\ 10^{-7}$	$1.88\ 10^{-7}$	$7.61\ 10^{-8}$	$4.27\ 10^{-8}$	$1.13\ 10^{-7}$	$2.59\ 10^{-7}$	$9.26\ 10^{-7}$
Th-230	$1.77\ 10^{-5}$	$6.07\ 10^{-5}$	$4.16\ 10^{-5}$	$2.24\ 10^{-5}$	$1.73\ 10^{-5}$	$2.68\ 10^{-5}$	$4.35\ 10^{-5}$	$2.30\ 10^{-4}$
Th-232	$2.74\ 10^{-5}$	$4.72\ 10^{-1}$	$2.60\ 10^{-2}$	$4.10\ 10^{-1}$	$3.67\ 10^{-1}$	$6.41\ 10^{-3}$	$8.51\ 10^{-5}$	$1.28\ 10^{0}$

Radionuclide	Activity (TBq)							
	Trench 1	Trench 2	Trench 3	Trench 4	Trench 5	Trench 6	Trench 7	TOTAL
Th-234	$2.38\ 10^{-7}$	$2.96\ 10^{-7}$	$1.37\ 10^{-7}$	$9.45\ 10^{-8}$	$6.39\ 10^{-8}$	$1.67\ 10^{-6}$	$2.04\ 10^{-4}$	$2.06\ 10^{-4}$
Tl-204	$6.27\ 10^{-6}$	$3.34\ 10^{-5}$	$1.39\ 10^{-4}$	$2.28\ 10^{-4}$	$3.25\ 10^{-4}$	$4.84\ 10^{-4}$	$3.70\ 10^{-4}$	$1.59\ 10^{-3}$
U-232	$5.47\ 10^{-5}$	$1.22\ 10^{-4}$	$1.34\ 10^{-4}$	$5.32\ 10^{-5}$	$2.98\ 10^{-5}$	$8.04\ 10^{-5}$	$1.99\ 10^{-4}$	$6.73\ 10^{-4}$
U-233	$3.58\ 10^{-6}$	$6.60\ 10^{-6}$	$1.05\ 10^{-5}$	$1.13\ 10^{-5}$	$1.46\ 10^{-5}$	$2.34\ 10^{-5}$	$2.02\ 10^{-4}$	$2.72\ 10^{-4}$
U-234	$3.79\ 10^{-1}$	$7.57\ 10^{-1}$	$2.05\ 10^{-1}$	$2.04\ 10^{0}$	$1.53\ 10^{0}$	$5.24\ 10^{-1}$	$4.46\ 10^{-1}$	$5.88\ 10^{0}$
U-235	$1.84\ 10^{-2}$	$3.67\ 10^{-2}$	$1.02\ 10^{-2}$	$9.71\ 10^{-2}$	$7.34\ 10^{-2}$	$2.54\ 10^{-2}$	$2.20\ 10^{-2}$	$2.83\ 10^{-1}$
U-236	$1.18\ 10^{-3}$	$2.55\ 10^{-3}$	$2.84\ 10^{-3}$	$6.19\ 10^{-3}$	$1.95\ 10^{-3}$	$2.01\ 10^{-3}$	$3.98\ 10^{-3}$	$2.07\ 10^{-2}$
U-238	$4.22\ 10^{-1}$	$8.98\ 10^{-1}$	$4.90\ 10^{-1}$	$2.14\ 10^{0}$	$1.61\ 10^{0}$	$5.85\ 10^{-1}$	$5.56\ 10^{-1}$	$6.70\ 10^{0}$
W-181	$2.48\ 10^{-7}$	$2.97\ 10^{-7}$	$1.06\ 10^{-6}$	$1.00\ 10^{-6}$	$1.31\ 10^{-6}$	$1.04\ 10^{-6}$	$4.66\ 10^{-7}$	$5.42\ 10^{-6}$
Y-91	$1.89\ 10^{-11}$	$4.25\ 10^{-11}$	$4.86\ 10^{-11}$	$1.83\ 10^{-11}$	$1.02\ 10^{-11}$	$2.82\ 10^{-11}$	$3.71\ 10^{-9}$	$3.88\ 10^{-9}$
Zn-65	$3.68\ 10^{-4}$	$1.97\ 10^{-3}$	$3.58\ 10^{-3}$	$6.73\ 10^{-3}$	$8.30\ 10^{-3}$	$1.25\ 10^{-2}$	$1.29\ 10^{-2}$	$4.64\ 10^{-2}$
Zr-93	$5.51\ 10^{-7}$	$9.30\ 10^{-6}$	$1.36\ 10^{-5}$	$8.03\ 10^{-6}$	$5.69\ 10^{-6}$	$2.52\ 10^{-4}$	$1.78\ 10^{-2}$	$1.81\ 10^{-2}$
Zr-95	$3.29\ 10^{-3}$	$7.64\ 10^{-3}$	$8.22\ 10^{-3}$	$3.40\ 10^{-3}$	$1.93\ 10^{-3}$	$4.99\ 10^{-3}$	$1.54\ 10^{-2}$	$4.49\ 10^{-2}$

Radionuclide	Activity (TBq)							
	Trench 1	Trench 2	Trench 3	Trench 4	Trench 5	Trench 6	Trench 7	TOTAL
Total	$2.53\ 10^{0}$	$1.91\ 10^{1}$	$3.84\ 10^{1}$	$2.83\ 10^{1}$	$1.26\ 10^{1}$	$4.52\ 10^{2}$	$1.32\ 10^{1}$	$5.65\ 10^{2}$

Table A.2: Summary of radionuclide activities in the Stage 3 Reference Inventory

Radionuclide or Radionuclide Group	Activity (TBq)									
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total forward vaults	Total vaults
Ac-227	$3.03\ 10^{-19}$	$1.89\ 10^{-2}$	$1.06\ 10^{-4}$	$1.90\ 10^{-2}$	$7.72\ 10^{-5}$	$1.83\ 10^{-4}$	$2.20\ 10^{-8}$	0	$7.73\ 10^{-5}$	$1.91\ 10^{-2}$
Ag-108	-	$8.61\ 10^{-7}$	$3.00\ 10^{-8}$	$8.91\ 10^{-7}$	-	$3.00\ 10^{-8}$	-	-	0	$8.91\ 10^{-7}$
Ag-108m	$2.45\ 10^{-5}$	$7.49\ 10^{-3}$	$5.66\ 10^{-3}$	$1.32\ 10^{-2}$	$4.79\ 10^{-2}$	$5.36\ 10^{-2}$	$1.83\ 10^{-2}$	$1.82\ 10^{-3}$	$6.81\ 10^{-2}$	$8.12\ 10^{-2}$
Ag-110	-	$1.13\ 10^{-4}$	$2.46\ 10^{-8}$	$1.13\ 10^{-4}$	-	$2.46\ 10^{-8}$	-	-	0	$1.13\ 10^{-4}$
Ag-110m	$2.38\ 10^{-3}$	$6.48\ 10^{-2}$	$1.63\ 10^{-3}$	$6.65\ 10^{-2}$	$1.71\ 10^{-1}$	$1.73\ 10^{-1}$	$4.29\ 10^{-1}$	0	$6.00\ 10^{-1}$	$6.67\ 10^{-1}$
Al-26	-	$1.03\ 10^{-6}$	0	$1.03\ 10^{-6}$	$4.20\ 10^{-4}$	$4.20\ 10^{-4}$	$1.46\ 10^{-4}$	0	$5.66\ 10^{-4}$	$5.67\ 10^{-4}$
Am-241	$6.19\ 10^{-1}$	$8.01\ 10^{-1}$	$5.29\ 10^{-1}$	$1.33\ 10^{0}$	$4.50\ 10^{0}$	$5.03\ 10^{0}$	$9.19\ 10^{-1}$	$9.53\ 10^{-3}$	$5.43\ 10^{0}$	$6.76\ 10^{0}$

Radionuclide or Radionuclide Group	Activity (TBq)									
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total forward vaults	Total vaults
Am-242m	$6.14\ 10^{-3}$	$1.95\ 10^{-4}$	$3.14\ 10^{-4}$	$5.09\ 10^{-4}$	$1.13\ 10^{-3}$	$1.44\ 10^{-3}$	$3.96\ 10^{-4}$	$1.41\ 10^{-10}$	$1.52\ 10^{-3}$	$2.03\ 10^{-3}$
Am-243	$6.44\ 10^{-5}$	$1.97\ 10^{-4}$	$1.70\ 10^{-4}$	$3.68\ 10^{-4}$	$6.16\ 10^{-4}$	$7.86\ 10^{-4}$	$1.17\ 10^{-2}$	$4.31\ 10^{-6}$	$1.23\ 10^{-2}$	$1.27\ 10^{-2}$
Ar-39	-	$1.97\ 10^{-7}$	0	$1.97\ 10^{-7}$	$7.63\ 10^{-5}$	$7.63\ 10^{-5}$	$7.06\ 10^{-4}$	0	$7.82\ 10^{-4}$	$7.83\ 10^{-4}$
Ar-42	-	0	0	0	0	0	0	0	0	0
Ba-133	$5.42\ 10^{-3}$	$1.78\ 10^{-1}$	$8.92\ 10^{-4}$	$1.79\ 10^{-1}$	$3.13\ 10^{-2}$	$3.22\ 10^{-2}$	$6.78\ 10^{-2}$	$8.58\ 10^{-3}$	$1.08\ 10^{-1}$	$2.87\ 10^{-1}$
Ba-137m	-	$8.46\ 10^{-2}$	$3.71\ 10^{-11}$	$8.46\ 10^{-2}$	-	$3.71\ 10^{-11}$	-	-	0	$8.46\ 10^{-2}$
Be-10	$5.29\ 10^{-16}$	$3.17\ 10^{-13}$	0	$3.17\ 10^{-13}$	$2.30\ 10^{-5}$	$2.30\ 10^{-5}$	$2.39\ 10^{-7}$	$4.86\ 10^{-8}$	$2.33\ 10^{-5}$	$2.33\ 10^{-5}$
Bi-207	-	$1.55\ 10^{-7}$	$6.14\ 10^{-6}$	$6.29\ 10^{-6}$	-	$6.14\ 10^{-6}$	-	-	0	$6.29\ 10^{-6}$
Bi-208	-	0	0	0	0	0	0	0	0	0
Bi-210m	-	0	0	0	$7.86\ 10^{-6}$	$7.86\ 10^{-6}$	0	0	$7.86\ 10^{-6}$	$7.86\ 10^{-6}$
Bi-214	-	$3.16\ 10^{-7}$	$2.32\ 10^{-7}$	$5.48\ 10^{-7}$	-	$2.32\ 10^{-7}$	-	-	0	$5.48\ 10^{-7}$
C-14	$9.98\ 10^{-2}$	$5.16\ 10^{-1}$	$1.23\ 10^{-1}$	$6.39\ 10^{-1}$	$3.07\ 10^{0}$	$3.19\ 10^{0}$	$1.40\ 10^{1}$	$1.38\ 10^{0}$	$1.84\ 10^{1}$	$1.91\ 10^{1}$

Radionuclide or Radionuclide Group	Activity (TBq)									
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total forward vaults	Total vaults
Ca-41	$5.58\ 10^{-3}$	$1.23\ 10^{-2}$	$3.60\ 10^{-4}$	$1.26\ 10^{-2}$	$6.87\ 10^{-1}$	$6.87\ 10^{-1}$	$1.87\ 10^{0}$	$1.25\ 10^{0}$	$3.81\ 10^{0}$	$3.82\ 10^{0}$
Ca-45	$2.07\ 10^{-3}$	$3.90\ 10^{-2}$	$9.16\ 10^{-4}$	$4.00\ 10^{-2}$	-	$9.16\ 10^{-4}$	-	-	0	$4.00\ 10^{-2}$
Cd-109	$3.47\ 10^{-3}$	$7.20\ 10^{-2}$	$2.86\ 10^{-4}$	$7.23\ 10^{-2}$	$2.76\ 10^{-3}$	$3.04\ 10^{-3}$	0	0	$2.76\ 10^{-3}$	$7.51\ 10^{-2}$
Cd-113	-	0	$2.66\ 10^{-5}$	$2.66\ 10^{-5}$	-	$2.66\ 10^{-5}$	-	-	0	$2.66\ 10^{-5}$
Cd-113m	$2.89\ 10^{-9}$	$4.98\ 10^{-5}$	$2.23\ 10^{-4}$	$2.73\ 10^{-4}$	$8.48\ 10^{-2}$	$8.50\ 10^{-2}$	$1.00\ 10^{-13}$	$5.99\ 10^{-9}$	$8.48\ 10^{-2}$	$8.51\ 10^{-2}$
Ce-139	-	$2.23\ 10^{-11}$	$4.93\ 10^{-10}$	$5.16\ 10^{-10}$	-	$4.93\ 10^{-10}$	-	-	0	$5.16\ 10^{-10}$
Ce-141	$1.09\ 10^{-3}$	$2.09\ 10^{-4}$	$7.20\ 10^{-8}$	$2.09\ 10^{-4}$	-	$7.20\ 10^{-8}$	-	-	0	$2.09\ 10^{-4}$
Ce-144	$1.05\ 10^{0}$	$9.16\ 10^{-1}$	$3.09\ 10^{-2}$	$9.46\ 10^{-1}$	$3.75\ 10^{-2}$	$6.84\ 10^{-2}$	$6.49\ 10^{-2}$	$7.51\ 10^{-4}$	$1.03\ 10^{-1}$	$1.05\ 10^{0}$
Cf-249	$7.50\ 10^{-9}$	$1.15\ 10^{-7}$	$7.66\ 10^{-7}$	$8.82\ 10^{-7}$	0	$7.66\ 10^{-7}$	$1.59\ 10^{-5}$	0	$1.59\ 10^{-5}$	$1.68\ 10^{-5}$
Cf-250	$7.35\ 10^{-8}$	$3.60\ 10^{-6}$	$1.62\ 10^{-8}$	$3.62\ 10^{-6}$	0	$1.62\ 10^{-8}$	$2.59\ 10^{-6}$	0	$2.59\ 10^{-6}$	$6.21\ 10^{-6}$
Cf-251	$1.51\ 10^{-6}$	$1.13\ 10^{-5}$	$1.79\ 10^{-6}$	$1.31\ 10^{-5}$	0	$1.79\ 10^{-6}$	0	0	0	$1.31\ 10^{-5}$
Cf-252	$2.53\ 10^{-5}$	$1.98\ 10^{-4}$	$3.05\ 10^{-6}$	$2.01\ 10^{-4}$	0	$3.05\ 10^{-6}$	0	0	0	$2.01\ 10^{-4}$

Radionuclide or Radionuclide Group	Activity (TBq)									
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total forward vaults	Total vaults
Cl-36	$1.85\ 10^{-2}$	$5.08\ 10^{-1}$	$9.67\ 10^{-2}$	$6.04\ 10^{-1}$	$5.99\ 10^{-1}$	$6.96\ 10^{-1}$	$2.26\ 10^{-1}$	$2.47\ 10^{-1}$	$1.07\ 10^{0}$	$1.68\ 10^{0}$
Cm-241	-	$1.50\ 10^{-5}$	$1.04\ 10^{-14}$	$1.50\ 10^{-5}$	-	$1.04\ 10^{-14}$	-	-	0	$1.50\ 10^{-5}$
Cm-242	$5.10\ 10^{-3}$	$9.00\ 10^{-3}$	$1.02\ 10^{-3}$	$1.00\ 10^{-2}$	$2.17\ 10^{-3}$	$3.19\ 10^{-3}$	$2.74\ 10^{-4}$	$2.34\ 10^{-6}$	$2.44\ 10^{-3}$	$1.25\ 10^{-2}$
Cm-243	$8.00\ 10^{-4}$	$5.02\ 10^{-4}$	$7.04\ 10^{-4}$	$1.21\ 10^{-3}$	$2.42\ 10^{-3}$	$3.13\ 10^{-3}$	$2.67\ 10^{-4}$	$2.12\ 10^{-6}$	$2.69\ 10^{-3}$	$3.90\ 10^{-3}$
Cm-244	$4.65\ 10^{-3}$	$1.43\ 10^{-2}$	$5.64\ 10^{-3}$	$1.99\ 10^{-2}$	$3.53\ 10^{-2}$	$4.09\ 10^{-2}$	$3.44\ 10^{-1}$	$1.77\ 10^{-4}$	$3.80\ 10^{-1}$	$4.00\ 10^{-1}$
Cm-245	$1.39\ 10^{-6}$	$3.04\ 10^{-6}$	$2.53\ 10^{-6}$	$5.57\ 10^{-6}$	$2.05\ 10^{-3}$	$2.05\ 10^{-3}$	$6.77\ 10^{-4}$	0	$2.73\ 10^{-3}$	$2.73\ 10^{-3}$
Cm-246	$8.34\ 10^{-7}$	$1.58\ 10^{-6}$	$2.02\ 10^{-8}$	$1.60\ 10^{-6}$	$2.85\ 10^{-5}$	$2.85\ 10^{-5}$	$4.87\ 10^{-3}$	0	$4.90\ 10^{-3}$	$4.90\ 10^{-3}$
Cm-247	-	$1.15\ 10^{-7}$	$1.24\ 10^{-6}$	$1.35\ 10^{-6}$	-	$1.24\ 10^{-6}$	-	-	0	$1.35\ 10^{-6}$
Cm-248	$2.66\ 10^{-6}$	$2.45\ 10^{-5}$	0	$2.45\ 10^{-5}$	$3.22\ 10^{-5}$	$3.22\ 10^{-5}$	0	0	$3.22\ 10^{-5}$	$5.67\ 10^{-5}$
Co-57	$2.34\ 10^{-2}$	$2.36\ 10^{-1}$	$5.18\ 10^{-4}$	$2.36\ 10^{-1}$	-	$5.18\ 10^{-4}$	-	-	0	$2.36\ 10^{-1}$
Co-58	$3.87\ 10^{-2}$	$5.82\ 10^{-3}$	$3.45\ 10^{-3}$	$9.27\ 10^{-3}$	-	$3.45\ 10^{-3}$	-	-	0	$9.27\ 10^{-3}$
Co-60	$1.65\ 10^{0}$	$5.89\ 10^{0}$	$7.84\ 10^{-1}$	$6.68\ 10^{0}$	$2.96\ 10^{1}$	$3.04\ 10^{1}$	$2.97\ 10^{2}$	$1.32\ 10^{2}$	$4.58\ 10^{2}$	$4.65\ 10^{2}$

Radionuclide or Radionuclide Group	Activity (TBq)									
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total forward vaults	Total vaults
Cr-51	$7.08\ 10^{-3}$	$2.14\ 10^{-3}$	$3.15\ 10^{-3}$	$5.28\ 10^{-3}$	-	$3.15\ 10^{-3}$	-	-	0	$5.28\ 10^{-3}$
Cs-134	$3.52\ 10^{-1}$	$6.19\ 10^{-1}$	$1.04\ 10^{-1}$	$7.23\ 10^{-1}$	$1.25\ 10^{-1}$	$2.29\ 10^{-1}$	$1.45\ 10^{-1}$	$1.96\ 10^{-3}$	$2.72\ 10^{-1}$	$9.95\ 10^{-1}$
Cs-135	$1.27\ 10^{-13}$	$3.96\ 10^{-4}$	$1.33\ 10^{-4}$	$5.30\ 10^{-4}$	$7.21\ 10^{-4}$	$8.54\ 10^{-4}$	$1.53\ 10^{-3}$	$2.12\ 10^{-11}$	$2.25\ 10^{-3}$	$2.78\ 10^{-3}$
Cs-137	$1.60\ 10^{1}$	$2.99\ 10^{1}$	$4.34\ 10^{0}$	$3.43\ 10^{1}$	$2.45\ 10^{1}$	$2.88\ 10^{1}$	$2.55\ 10^{1}$	$3.29\ 10^{-1}$	$5.03\ 10^{1}$	$8.46\ 10^{1}$
Es-254	$2.50\ 10^{-9}$	$8.12\ 10^{-8}$	$1.62\ 10^{-8}$	$9.74\ 10^{-8}$	-	$1.62\ 10^{-8}$	-	-	0	$9.74\ 10^{-8}$
Eu-152	$1.81\ 10^{-1}$	$5.44\ 10^{-1}$	$4.40\ 10^{-3}$	$5.49\ 10^{-1}$	$1.71\ 10^{0}$	$1.71\ 10^{0}$	$6.06\ 10^{-1}$	$3.17\ 10^{-1}$	$2.63\ 10^{0}$	$3.18\ 10^{0}$
Eu-154	$5.76\ 10^{-2}$	$1.57\ 10^{-1}$	$2.10\ 10^{-2}$	$1.78\ 10^{-1}$	$1.17\ 10^{-1}$	$1.38\ 10^{-1}$	$4.25\ 10^{-2}$	$3.90\ 10^{-2}$	$1.99\ 10^{-1}$	$3.77\ 10^{-1}$
Eu-155	$1.41\ 10^{-2}$	$3.52\ 10^{-2}$	$9.37\ 10^{-3}$	$4.46\ 10^{-2}$	$2.98\ 10^{-2}$	$3.91\ 10^{-2}$	$2.11\ 10^{-3}$	$1.76\ 10^{-4}$	$3.21\ 10^{-2}$	$7.66\ 10^{-2}$
Fe-55	$5.68\ 10^{-1}$	$8.38\ 10^{0}$	$1.14\ 10^{0}$	$9.51\ 10^{0}$	$2.00\ 10^{2}$	$2.01\ 10^{2}$	$3.22\ 10^{2}$	$7.84\ 10^{1}$	$6.01\ 10^{2}$	$6.10\ 10^{2}$
Fe-59	$6.55\ 10^{-3}$	$1.99\ 10^{-2}$	$5.08\ 10^{-4}$	$2.05\ 10^{-2}$	-	$5.08\ 10^{-4}$	-	-	0	$2.05\ 10^{-2}$
Gd-153	$3.00\ 10^{-4}$	$8.01\ 10^{-3}$	$9.82\ 10^{-8}$	$8.01\ 10^{-3}$	$8.42\ 10^{-8}$	$1.82\ 10^{-7}$	$1.48\ 10^{-7}$	$1.88\ 10^{-7}$	$4.21\ 10^{-7}$	$8.01\ 10^{-3}$
Ge-68	-	0	$5.00\ 10^{-6}$	$5.00\ 10^{-6}$	-	$5.00\ 10^{-6}$	-	-	0	$5.00\ 10^{-6}$

Radionuclide or Radionuclide Group	Activity (TBq)									
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total forward vaults	Total vaults
H-3	$5.02\ 10^{2}$	$2.16\ 10^{1}$	$6.59\ 10^{0}$	$2.82\ 10^{1}$	$1.90\ 10^{2}$	$1.96\ 10^{2}$	$1.20\ 10^{1}$	$2.57\ 10^{0}$	$2.04\ 10^{2}$	$2.33\ 10^{2}$
Hf-178n	-	0	0	0	$4.32\ 10^{-5}$	$4.32\ 10^{-5}$	0	0	$4.32\ 10^{-5}$	$4.32\ 10^{-5}$
Hf-182	-	0	0	0	0	0	0	0	0	0
Hg-203	$2.89\ 10^{-5}$	$9.63\ 10^{-7}$	$1.80\ 10^{-5}$	$1.89\ 10^{-5}$	-	$1.80\ 10^{-5}$	-	-	0	$1.89\ 10^{-5}$
Ho-163	-	0	0	0	$9.41\ 10^{-6}$	$9.41\ 10^{-6}$	$4.98\ 10^{-5}$	0	$5.92\ 10^{-5}$	$5.92\ 10^{-5}$
Ho-166m	$2.29\ 10^{-7}$	$2.64\ 10^{-5}$	$3.08\ 10^{-5}$	$5.72\ 10^{-5}$	$2.76\ 10^{-3}$	$2.79\ 10^{-3}$	$8.90\ 10^{-4}$	$1.27\ 10^{-3}$	$4.92\ 10^{-3}$	$4.98\ 10^{-3}$
I-125	$8.48\ 10^{-6}$	$2.37\ 10^{-5}$	$6.47\ 10^{-6}$	$3.02\ 10^{-5}$	-	$6.47\ 10^{-6}$	-	-	0	$3.02\ 10^{-5}$
I-129	$2.95\ 10^{-3}$	$2.85\ 10^{-3}$	$4.47\ 10^{-4}$	$3.29\ 10^{-3}$	$3.34\ 10^{-2}$	$3.39\ 10^{-2}$	$2.47\ 10^{-4}$	$2.00\ 10^{-7}$	$3.37\ 10^{-2}$	$3.70\ 10^{-2}$
Ir-192	$1.75\ 10^{-4}$	$1.12\ 10^{-3}$	$6.41\ 10^{-9}$	$1.12\ 10^{-3}$	-	$6.41\ 10^{-9}$	-	-	0	$1.12\ 10^{-3}$
K-40	$2.54\ 10^{-4}$	$2.65\ 10^{-3}$	$2.29\ 10^{-5}$	$2.67\ 10^{-3}$	$3.39\ 10^{-4}$	$3.62\ 10^{-4}$	0	0	$3.39\ 10^{-4}$	$3.01\ 10^{-3}$
Kr-81	-	0	0	0	$9.29\ 10^{-7}$	$9.29\ 10^{-7}$	0	0	$9.29\ 10^{-7}$	$9.29\ 10^{-7}$
Kr-85	$7.42\ 10^{-3}$	$9.00\ 10^{-2}$	$4.76\ 10^{-3}$	$9.48\ 10^{-2}$	$2.48\ 10^{-3}$	$7.24\ 10^{-3}$	$1.86\ 10^{-3}$	0	$4.34\ 10^{-3}$	$9.91\ 10^{-2}$

Radionuclide or Radionuclide Group	Activity (TBq)									
	Trench	**Vault 8**	**Disposed Vault 9 and 9a**	**Total disposed vaults**	**Forward Vault 9 and 9a**	**Total Vault 9 and 9a**	**Vault 10**	**Vault 11**	**Total forward vaults**	**Total vaults**
La-137	-	$4.77\ 10^{-15}$	0	$4.77\ 10^{-15}$	$1.19\ 10^{-6}$	$1.19\ 10^{-6}$	$5.35\ 10^{-6}$	$6.80\ 10^{-6}$	$1.33\ 10^{-5}$	$1.33\ 10^{-5}$
La-138	-	0	0	0	0	0	0	0	0	0
Lu-174	-	0	0	0	0	0	0	0	0	0
Lu-176	-	$2.48\ 10^{-9}$	0	$2.48\ 10^{-9}$	$4.70\ 10^{-6}$	$4.70\ 10^{-6}$	0	0	$4.70\ 10^{-6}$	$4.70\ 10^{-6}$
Mn-53	-	0	0	0	$4.58\ 10^{-7}$	$4.58\ 10^{-7}$	0	0	$4.58\ 10^{-7}$	$4.58\ 10^{-7}$
Mn-54	$4.54\ 10^{-2}$	$1.56\ 10^{-1}$	$4.38\ 10^{-2}$	$1.99\ 10^{-1}$	$1.91\ 10^{1}$	$1.91\ 10^{1}$	$4.19\ 10^{1}$	$1.37\ 10^{1}$	$7.48\ 10^{1}$	$7.50\ 10^{1}$
Mo-93	$9.02\ 10^{-8}$	$5.37\ 10^{-6}$	$1.18\ 10^{-5}$	$1.72\ 10^{-5}$	$2.36\ 10^{-2}$	$2.36\ 10^{-2}$	$7.35\ 10^{-1}$	$1.13\ 10^{-2}$	$7.70\ 10^{-1}$	$7.70\ 10^{-1}$
Na-22	$2.79\ 10^{-3}$	$6.94\ 10^{-2}$	$2.10\ 10^{-5}$	$6.94\ 10^{-2}$	$2.42\ 10^{-1}$	$2.42\ 10^{-1}$	$9.86\ 10^{-2}$	0	$3.41\ 10^{-1}$	$4.10\ 10^{-1}$
Nb-91	-	0	0	0	$6.23\ 10^{-5}$	$6.23\ 10^{-5}$	0	0	$6.23\ 10^{-5}$	$6.23\ 10^{-5}$
Nb-92	-	0	0	0	$4.34\ 10^{-8}$	$4.34\ 10^{-8}$	$5.71\ 10^{-8}$	0	$1.01\ 10^{-7}$	$1.01\ 10^{-7}$
Nb-93m	$5.56\ 10^{-4}$	$4.37\ 10^{-5}$	$2.43\ 10^{-4}$	$2.87\ 10^{-4}$	$2.49\ 10^{-2}$	$2.51\ 10^{-2}$	$1.93\ 10^{-3}$	$1.04\ 10^{-3}$	$2.78\ 10^{-2}$	$2.81\ 10^{-2}$
Nb-94	$7.92\ 10^{-5}$	$4.91\ 10^{-3}$	$2.10\ 10^{-3}$	$7.02\ 10^{-3}$	$1.76\ 10^{-2}$	$1.97\ 10^{-2}$	$2.05\ 10^{-2}$	$2.92\ 10^{-3}$	$4.11\ 10^{-2}$	$4.81\ 10^{-2}$

Radionuclide or Radionuclide Group	Activity (TBq)									
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total forward vaults	Total vaults
Nb-95	$8.28\ 10^{-2}$	$1.69\ 10^{-1}$	$7.46\ 10^{-3}$	$1.77\ 10^{-1}$	-	$7.46\ 10^{-3}$	-	-	0	$1.77\ 10^{-1}$
Ni-59	$1.78\ 10^{-4}$	$4.69\ 10^{-3}$	$7.59\ 10^{-4}$	$5.45\ 10^{-3}$	$3.69\ 10^{-1}$	$3.70\ 10^{-1}$	$2.14\ 10^{0}$	$5.05\ 10^{-1}$	$3.02\ 10^{0}$	$3.02\ 10^{0}$
Ni-63	$2.32\ 10^{-1}$	$2.99\ 10^{0}$	$7.90\ 10^{-1}$	$3.78\ 10^{0}$	$3.83\ 10^{1}$	$3.91\ 10^{1}$	$1.70\ 10^{2}$	$4.54\ 10^{1}$	$2.54\ 10^{2}$	$2.58\ 10^{2}$
Np-235	-	0	$5.00\ 10^{-8}$	$5.00\ 10^{-8}$	-	$5.00\ 10^{-8}$	-	-	0	$5.00\ 10^{-8}$
Np-237	$2.65\ 10^{-2}$	$3.99\ 10^{-2}$	$4.61\ 10^{-3}$	$4.45\ 10^{-2}$	$6.37\ 10^{-2}$	$6.83\ 10^{-2}$	$5.34\ 10^{-3}$	$9.94\ 10^{-5}$	$6.91\ 10^{-2}$	$1.14\ 10^{-1}$
Np-239	-	$6.19\ 10^{-4}$	$8.01\ 10^{-12}$	$6.19\ 10^{-4}$	-	$8.01\ 10^{-12}$	-	-	0	$6.19\ 10^{-4}$
OA	$4.97\ 10^{-2}$	0	0	0	$9.60\ 10^{-1}$	$9.60\ 10^{-1}$	$8.69\ 10^{-1}$	$5.98\ 10^{-5}$	$1.83\ 10^{0}$	$1.83\ 10^{0}$
OBG	$2.26\ 10^{0}$	0	0	0	$5.65\ 10^{1}$	$5.65\ 10^{1}$	$2.17\ 10^{1}$	$2.34\ 10^{-3}$	$7.83\ 10^{1}$	$7.83\ 10^{1}$
OTHSA	-	$1.48\ 10^{-3}$	$1.40\ 10^{-5}$	$1.49\ 10^{-3}$	-	$1.40\ 10^{-5}$	-	-	0	$1.49\ 10^{-3}$
OTHSB	-	$6.77\ 10^{-1}$	$5.68\ 10^{-2}$	$7.34\ 10^{-1}$	-	$5.68\ 10^{-2}$	-	-	0	$7.34\ 10^{-1}$
P-33	$8.27\ 10^{-6}$	$3.33\ 10^{-5}$	$1.91\ 10^{-10}$	$3.33\ 10^{-5}$	-	$1.91\ 10^{-10}$	-	-	0	$3.33\ 10^{-5}$
Pa-231	$9.02\ 10^{-5}$	$5.01\ 10^{-4}$	$1.20\ 10^{-4}$	$6.21\ 10^{-4}$	$9.91\ 10^{-5}$	$2.19\ 10^{-4}$	$5.05\ 10^{-8}$	$1.91\ 10^{-11}$	$9.91\ 10^{-5}$	$7.20\ 10^{-4}$

Radionuclide or Radionuclide Group	Activity (TBq)									
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total forward vaults	Total vaults
Pa-232	$5.35\ 10^{-7}$	$8.83\ 10^{-4}$	$1.61\ 10^{-6}$	$8.85\ 10^{-4}$	-	$1.61\ 10^{-6}$	-	-	0	$8.85\ 10^{-4}$
Pa-233	$5.67\ 10^{-6}$	$2.83\ 10^{-5}$	$1.83\ 10^{-5}$	$4.66\ 10^{-5}$	$6.00\ 10^{-2}$	$6.00\ 10^{-2}$	$1.49\ 10^{-4}$	0	$6.01\ 10^{-2}$	$6.02\ 10^{-2}$
Pa-234	-	0	$2.06\ 10^{-4}$	$2.06\ 10^{-4}$	-	$2.06\ 10^{-4}$	-	-	0	$2.06\ 10^{-4}$
Pa-234m	-	$2.00\ 10^{-8}$	$8.79\ 10^{-18}$	$2.00\ 10^{-8}$	-	$8.79\ 10^{-18}$	-	-	0	$2.00\ 10^{-8}$
Pb-205	-	0	0	0	0	0	0	0	0	0
Pb-210	$2.22\ 10^{-3}$	$4.72\ 10^{-2}$	$8.08\ 10^{-3}$	$5.52\ 10^{-2}$	$1.36\ 10^{-3}$	$9.45\ 10^{-3}$	$2.02\ 10^{-9}$	0	$1.36\ 10^{-3}$	$5.66\ 10^{-2}$
Pb-212	-	$6.74\ 10^{-5}$	$2.29\ 10^{-12}$	$6.74\ 10^{-5}$	-	$2.29\ 10^{-12}$	-	-	0	$6.74\ 10^{-5}$
Pd-107	$2.04\ 10^{-14}$	$1.41\ 10^{-10}$	0	$1.41\ 10^{-10}$	$1.44\ 10^{-5}$	$1.44\ 10^{-5}$	$1.63\ 10^{-5}$	0	$3.07\ 10^{-5}$	$3.07\ 10^{-5}$
Pm-145	-	0	$2.89\ 10^{-6}$	$2.89\ 10^{-6}$	$1.99\ 10^{-4}$	$2.02\ 10^{-4}$	$1.95\ 10^{-4}$	$1.62\ 10^{-4}$	$5.55\ 10^{-4}$	$5.58\ 10^{-4}$
Pm-147	$1.50\ 10^{-1}$	$9.23\ 10^{-1}$	$1.07\ 10^{-1}$	$1.03\ 10^{0}$	$8.20\ 10^{-1}$	$9.27\ 10^{-1}$	$1.34\ 10^{-2}$	$3.02\ 10^{-5}$	$8.33\ 10^{-1}$	$1.86\ 10^{0}$
Po-208	-	$2.45\ 10^{-6}$	$2.67\ 10^{-10}$	$2.45\ 10^{-6}$	-	$2.67\ 10^{-10}$	-	-	0	$2.45\ 10^{-6}$
Po-210	$1.01\ 10^{-2}$	$1.09\ 10^{-1}$	$5.47\ 10^{-3}$	$1.15\ 10^{-1}$	$1.24\ 10^{-3}$	$6.71\ 10^{-3}$	$1.96\ 10^{-9}$	0	$1.24\ 10^{-3}$	$1.16\ 10^{-1}$

Radionuclide or Radionuclide Group	Activity (TBq)									
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total forward vaults	Total vaults
Pr-144	-	$1.76\ 10^{-5}$	$4.63\ 10^{-14}$	$1.76\ 10^{-5}$	-	$4.63\ 10^{-14}$	-	-	0	$1.76\ 10^{-5}$
Pr-144m	-	$2.22\ 10^{-7}$	$5.19\ 10^{-16}$	$2.22\ 10^{-7}$	-	$5.19\ 10^{-16}$	-	-	0	$2.22\ 10^{-7}$
Pt-193	-	$3.24\ 10^{-5}$	$6.62\ 10^{-5}$	$9.86\ 10^{-5}$	$7.51\ 10^{-5}$	$1.41\ 10^{-4}$	0	0	$7.51\ 10^{-5}$	$1.74\ 10^{-4}$
Pu-236	$1.38\ 10^{-5}$	$2.96\ 10^{-5}$	$5.01\ 10^{-9}$	$2.96\ 10^{-5}$	$1.15\ 10^{-10}$	$5.12\ 10^{-9}$	0	0	$1.15\ 10^{-10}$	$2.97\ 10^{-5}$
Pu-238	$2.08\ 10^{-1}$	$2.62\ 10^{-1}$	$6.47\ 10^{-2}$	$3.26\ 10^{-1}$	$1.71\ 10^{0}$	$1.77\ 10^{0}$	$2.73\ 10^{-1}$	$3.01\ 10^{-3}$	$1.98\ 10^{0}$	$2.31\ 10^{0}$
Pu-239	$1.61\ 10^{0}$	$4.27\ 10^{-1}$	$1.36\ 10^{-1}$	$5.63\ 10^{-1}$	$2.89\ 10^{0}$	$3.02\ 10^{0}$	$1.16\ 10^{0}$	$1.38\ 10^{-2}$	$4.06\ 10^{0}$	$4.63\ 10^{0}$
Pu-240	$8.17\ 10^{-1}$	$2.48\ 10^{-1}$	$1.12\ 10^{-1}$	$3.60\ 10^{-1}$	$1.54\ 10^{0}$	$1.65\ 10^{0}$	$5.19\ 10^{-1}$	$5.54\ 10^{-3}$	$2.06\ 10^{0}$	$2.42\ 10^{0}$
Pu-241	$1.46\ 10^{1}$	$7.79\ 10^{0}$	$2.14\ 10^{0}$	$9.93\ 10^{0}$	$2.77\ 10^{1}$	$2.98\ 10^{1}$	$8.89\ 10^{0}$	$9.44\ 10^{-2}$	$3.67\ 10^{1}$	$4.66\ 10^{1}$
Pu-242	$1.58\ 10^{-4}$	$9.06\ 10^{-4}$	$2.18\ 10^{-5}$	$9.28\ 10^{-4}$	$2.53\ 10^{-3}$	$2.55\ 10^{-3}$	$6.68\ 10^{-4}$	$2.19\ 10^{-6}$	$3.20\ 10^{-3}$	$4.12\ 10^{-3}$
Pu-244	-	$2.54\ 10^{-11}$	$6.69\ 10^{-12}$	$3.21\ 10^{-11}$	-	$6.69\ 10^{-12}$	-	-	0	$3.21\ 10^{-11}$
PUALD	-	$1.02\ 10^{-1}$	$9.03\ 10^{-2}$	$1.92\ 10^{-1}$	-	$9.03\ 10^{-2}$	-	-	0	$1.92\ 10^{-1}$
Ra-223	-	$5.48\ 10^{-12}$	$2.00\ 10^{-8}$	$2.00\ 10^{-8}$	$7.71\ 10^{-5}$	$7.72\ 10^{-5}$	$2.19\ 10^{-8}$	0	$7.72\ 10^{-5}$	$7.72\ 10^{-5}$

Radionuclide or Radionuclide Group	Activity (TBq)									
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total forward vaults	Total vaults
Ra-225	$7.17\ 10^{-8}$	$2.05\ 10^{-6}$	$5.05\ 10^{-10}$	$2.06\ 10^{-6}$	$2.63\ 10^{-6}$	$2.63\ 10^{-6}$	$2.89\ 10^{-14}$	0	$2.63\ 10^{-6}$	$4.69\ 10^{-6}$
Ra-226	$2.90\ 10^{-1}$	$9.00\ 10^{-2}$	$1.85\ 10^{-2}$	$1.08\ 10^{-1}$	$6.17\ 10^{-3}$	$2.47\ 10^{-2}$	$3.86\ 10^{-5}$	0	$6.21\ 10^{-3}$	$1.15\ 10^{-1}$
Ra-228	$1.90\ 10^{0}$	$3.83\ 10^{-2}$	$5.63\ 10^{-3}$	$4.40\ 10^{-2}$	$6.49\ 10^{-4}$	$6.28\ 10^{-3}$	$1.61\ 10^{-14}$	0	$6.49\ 10^{-4}$	$4.46\ 10^{-2}$
Rb-87	-	$3.08\ 10^{-14}$	0	$3.08\ 10^{-14}$	0	0	0	0	0	$3.08\ 10^{-14}$
Rh-102	-	$8.64\ 10^{-7}$	$1.05\ 10^{-12}$	$8.64\ 10^{-7}$	-	$1.05\ 10^{-12}$	-	-	0	$8.64\ 10^{-7}$
Rh-106	-	$5.45\ 10^{-4}$	$1.09\ 10^{-12}$	$5.45\ 10^{-4}$	-	$1.09\ 10^{-12}$	-	-	0	$5.45\ 10^{-4}$
RRNAD	-	0	$2.47\ 10^{-6}$	$2.47\ 10^{-6}$	-	$2.47\ 10^{-6}$	-	-	0	$2.47\ 10^{-6}$
Ru-103	$1.14\ 10^{-2}$	$1.36\ 10^{-2}$	$2.26\ 10^{-4}$	$1.38\ 10^{-2}$	-	$2.26\ 10^{-4}$	-	-	0	$1.38\ 10^{-2}$
Ru-106	$8.21\ 10^{-1}$	$1.32\ 10^{0}$	$9.55\ 10^{-2}$	$1.41\ 10^{0}$	$1.53\ 10^{-1}$	$2.48\ 10^{-1}$	$9.77\ 10^{-2}$	$1.03\ 10^{-3}$	$2.52\ 10^{-1}$	$1.66\ 10^{0}$
S-35	$3.04\ 10^{-3}$	$1.03\ 10^{-2}$	$4.05\ 10^{-2}$	$5.08\ 10^{-2}$	-	$4.05\ 10^{-2}$	-	-	0	$5.08\ 10^{-2}$
Sb-124	$3.26\ 10^{-5}$	$9.78\ 10^{-5}$	$3.47\ 10^{-4}$	$4.45\ 10^{-4}$	-	$3.47\ 10^{-4}$	-	-	0	$4.45\ 10^{-4}$
Sb-125	$1.57\ 10^{-1}$	$2.86\ 10^{-1}$	$3.14\ 10^{-2}$	$3.18\ 10^{-1}$	$9.81\ 10^{-2}$	$1.29\ 10^{-1}$	$3.26\ 10^{-2}$	$1.79\ 10^{-5}$	$1.31\ 10^{-1}$	$4.48\ 10^{-1}$

Radionuclide or Radionuclide Group	Activity (TBq)									
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total forward vaults	Total vaults
Sb-126	-	1.49 10^{-10}	0	1.49 10^{-10}	3.42 10^{-6}	3.42 10^{-6}	1.02 10^{-5}	0	1.36 10^{-5}	1.36 10^{-5}
Sc-46	9.25 10^{-5}	2.82 10^{-4}	1.21 10^{-4}	4.03 10^{-4}	-	1.21 10^{-4}	-	-	0	4.03 10^{-4}
Se-75	2.66 10^{-3}	6.72 10^{-2}	1.15 10^{-4}	6.73 10^{-2}	-	1.15 10^{-4}	-	-	0	6.73 10^{-2}
Se-79	1.93 10^{-13}	4.90 10^{-10}	0	4.90 10^{-10}	1.17 10^{-5}	1.17 10^{-5}	2.20 10^{-6}	2.60 10^{-10}	1.39 10^{-5}	1.39 10^{-5}
Sm-147	-	1.36 10^{-14}	0	1.36 10^{-14}	5.88 10^{-17}	5.88 10^{-17}	0	0	5.88 10^{-17}	1.37 10^{-14}
Sm-151	3.00 10^{-3}	2.46 10^{-2}	2.43 10^{-2}	4.89 10^{-2}	3.26 10^{-1}	3.50 10^{-1}	1.70 10^{-1}	1.69 10^{-1}	6.65 10^{-1}	7.14 10^{-1}
Sn-113	2.82 10^{-5}	1.46 10^{-3}	1.61 10^{-6}	1.47 10^{-3}	-	1.61 10^{-6}	-	-	0	1.47 10^{-3}
Sn-119m	3.63 10^{-6}	9.16 10^{-5}	1.22 10^{-9}	9.16 10^{-5}	1.58 10^{-7}	1.59 10^{-7}	0	0	1.58 10^{-7}	9.17 10^{-5}
Sn-121	-	4.15 10^{-5}	1.33 10^{-6}	4.28 10^{-5}	-	1.33 10^{-6}	-	-	0	4.28 10^{-5}
Sn-121m	2.88 10^{-12}	1.39 10^{-6}	2.23 10^{-5}	2.36 10^{-5}	3.65 10^{-3}	3.67 10^{-3}	1.24 10^{-1}	2.69 10^{-5}	1.28 10^{-1}	1.28 10^{-1}
Sn-123	-	0	0	0	0	0	0	0	0	0
Sn-126	4.73 10^{-14}	1.06 10^{-9}	1.20 10^{-8}	1.31 10^{-8}	8.18 10^{-5}	8.18 10^{-5}	7.33 10^{-5}	0	1.55 10^{-4}	1.55 10^{-4}

Radionuclide or Radionuclide Group	Activity (TBq)									
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total forward vaults	Total vaults
Sr-85	$8.40\ 10^{-5}$	$7.93\ 10^{-4}$	$4.12\ 10^{-6}$	$7.98\ 10^{-4}$	-	$4.12\ 10^{-6}$	-	-	0	$7.98\ 10^{-4}$
Sr-89	$2.81\ 10^{-3}$	$7.26\ 10^{-4}$	$1.75\ 10^{-7}$	$7.26\ 10^{-4}$	-	$1.75\ 10^{-7}$	-	-	0	$7.26\ 10^{-4}$
Sr-90	$3.64\ 10^{0}$	$8.56\ 10^{0}$	$2.57\ 10^{0}$	$1.11\ 10^{1}$	$1.11\ 10^{1}$	$1.37\ 10^{1}$	$5.55\ 10^{0}$	$6.16\ 10^{-2}$	$1.67\ 10^{1}$	$2.78\ 10^{1}$
Ta-182	$1.08\ 10^{-6}$	$1.45\ 10^{-3}$	$4.00\ 10^{-4}$	$1.85\ 10^{-3}$	-	$4.00\ 10^{-4}$	-	-	0	$1.85\ 10^{-3}$
Tc-97	-	0	0	0	0	0	0	0	0	0
Tc-99	$2.05\ 10^{-1}$	$2.58\ 10^{0}$	$1.54\ 10^{-1}$	$2.73\ 10^{0}$	$1.11\ 10^{-1}$	$2.66\ 10^{-1}$	$7.58\ 10^{-2}$	$2.68\ 10^{-3}$	$1.90\ 10^{-1}$	$2.92\ 10^{0}$
Te-125m	$6.99\ 10^{-4}$	$1.08\ 10^{-3}$	$2.43\ 10^{-4}$	$1.32\ 10^{-3}$	$4.32\ 10^{-4}$	$6.76\ 10^{-4}$	$1.73\ 10^{-7}$	0	$4.33\ 10^{-4}$	$1.75\ 10^{-3}$
Te-127m	-	0	0	0	$4.99\ 10^{-7}$	$4.99\ 10^{-7}$	$4.02\ 10^{-8}$	0	$5.39\ 10^{-7}$	$5.39\ 10^{-7}$
Th-227	-	$5.48\ 10^{-12}$	$2.00\ 10^{-8}$	$2.00\ 10^{-8}$	$7.61\ 10^{-5}$	$7.61\ 10^{-5}$	$1.97\ 10^{-8}$	0	$7.61\ 10^{-5}$	$7.61\ 10^{-5}$
Th-228	$1.25\ 10^{0}$	$6.49\ 10^{-2}$	$5.61\ 10^{-3}$	$7.05\ 10^{-2}$	$1.81\ 10^{-3}$	$7.42\ 10^{-3}$	$1.67\ 10^{-4}$	0	$1.98\ 10^{-3}$	$7.25\ 10^{-2}$
Th-229	$9.26\ 10^{-7}$	$2.21\ 10^{-7}$	$1.01\ 10^{-7}$	$3.22\ 10^{-7}$	$2.68\ 10^{-6}$	$2.78\ 10^{-6}$	$2.94\ 10^{-14}$	0	$2.68\ 10^{-6}$	$3.00\ 10^{-6}$
Th-230	$2.30\ 10^{-4}$	$6.58\ 10^{-3}$	$7.85\ 10^{-4}$	$7.37\ 10^{-3}$	$6.19\ 10^{-4}$	$1.40\ 10^{-3}$	$1.49\ 10^{-4}$	0	$7.68\ 10^{-4}$	$8.14\ 10^{-3}$

Radionuclide or Radionuclide Group	Activity (TBq)									
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total forward vaults	Total vaults
Th-231	-	0	$1.01\ 10^{-5}$	$1.01\ 10^{-5}$	-	$1.01\ 10^{-5}$	-	-	0	$1.01\ 10^{-5}$
Th-232	$1.28\ 10^{0}$	$7.36\ 10^{-2}$	$9.03\ 10^{-4}$	$7.45\ 10^{-2}$	$1.79\ 10^{-3}$	$2.69\ 10^{-3}$	$2.73\ 10^{-5}$	0	$1.82\ 10^{-3}$	$7.64\ 10^{-2}$
Th-234	$2.06\ 10^{-4}$	$2.41\ 10^{-5}$	$6.57\ 10^{-4}$	$6.82\ 10^{-4}$	$9.27\ 10^{-3}$	$9.93\ 10^{-3}$	$7.75\ 10^{-4}$	0	$1.00\ 10^{-2}$	$1.07\ 10^{-2}$
Tl-204	$1.59\ 10^{-3}$	$2.50\ 10^{-2}$	$4.32\ 10^{-4}$	$2.55\ 10^{-2}$	$1.29\ 10^{-2}$	$1.33\ 10^{-2}$	$2.76\ 10^{-5}$	0	$1.29\ 10^{-2}$	$3.84\ 10^{-2}$
Tm-170	-	0	0	0	0	0	0	0	0	0
Tm-171	-	0	0	0	$3.07\ 10^{-4}$	$3.07\ 10^{-4}$	0	0	$3.07\ 10^{-4}$	$3.07\ 10^{-4}$
U-232	$6.73\ 10^{-4}$	$9.69\ 10^{-4}$	$3.33\ 10^{-4}$	$1.30\ 10^{-3}$	$1.28\ 10^{-3}$	$1.62\ 10^{-3}$	$7.17\ 10^{-5}$	0	$1.35\ 10^{-3}$	$2.66\ 10^{-3}$
U-233	$2.72\ 10^{-4}$	$9.51\ 10^{-4}$	$9.31\ 10^{-6}$	$9.61\ 10^{-4}$	$1.10\ 10^{-2}$	$1.10\ 10^{-2}$	$3.01\ 10^{-5}$	$1.29\ 10^{-9}$	$1.10\ 10^{-2}$	$1.20\ 10^{-2}$
U-234	$5.88\ 10^{0}$	$6.42\ 10^{-1}$	$8.38\ 10^{-2}$	$7.25\ 10^{-1}$	$3.39\ 10^{-1}$	$4.23\ 10^{-1}$	$6.52\ 10^{-2}$	$1.52\ 10^{-4}$	$4.05\ 10^{-1}$	$1.13\ 10^{0}$
U-235	$2.83\ 10^{-1}$	$2.87\ 10^{-2}$	$3.21\ 10^{-3}$	$3.19\ 10^{-2}$	$1.17\ 10^{-2}$	$1.49\ 10^{-2}$	$2.36\ 10^{-3}$	$5.92\ 10^{-6}$	$1.41\ 10^{-2}$	$4.59\ 10^{-2}$
U-236	$2.07\ 10^{-2}$	$2.33\ 10^{-2}$	$5.17\ 10^{-3}$	$2.84\ 10^{-2}$	$4.57\ 10^{-3}$	$9.75\ 10^{-3}$	$9.88\ 10^{-4}$	$1.15\ 10^{-6}$	$5.56\ 10^{-3}$	$3.40\ 10^{-2}$
U-237	-	$1.72\ 10^{-7}$	$8.00\ 10^{-8}$	$2.52\ 10^{-7}$	-	$8.00\ 10^{-8}$	-	-	0	$2.52\ 10^{-7}$

Radionuclide or Radionuclide Group	Activity (TBq)									
	Trench	**Vault 8**	**Disposed Vault 9 and 9a**	**Total disposed vaults**	**Forward Vault 9 and 9a**	**Total Vault 9 and 9a**	**Vault 10**	**Vault 11**	**Total forward vaults**	**Total vaults**
U-238	$6.70\ 10^{0}$	$1.04\ 10^{0}$	$8.40\ 10^{-2}$	$1.12\ 10^{0}$	$6.71\ 10^{-2}$	$1.51\ 10^{-1}$	$2.63\ 10^{-2}$	$1.83\ 10^{-4}$	$9.36\ 10^{-2}$	$1.21\ 10^{0}$
UALD	-	$5.14\ 10^{-2}$	$8.17\ 10^{-3}$	$5.96\ 10^{-2}$	-	$8.17\ 10^{-3}$	-	-	0	$5.96\ 10^{-2}$
URRM	-	$2.76\ 10^{-2}$	$1.79\ 10^{-2}$	$4.55\ 10^{-2}$	-	$1.79\ 10^{-2}$	-	-	0	$4.55\ 10^{-2}$
W-181	$5.42\ 10^{-6}$	$1.93\ 10^{-5}$	$2.12\ 10^{-6}$	$2.15\ 10^{-5}$	-	$2.12\ 10^{-6}$	-	-	0	$2.15\ 10^{-5}$
Y-88	-	0	$1.00\ 10^{-8}$	$1.00\ 10^{-8}$	-	$1.00\ 10^{-8}$	-	-	0	$1.00\ 10^{-8}$
Y-90	-	$8.80\ 10^{-2}$	$9.40\ 10^{-7}$	$8.80\ 10^{-2}$	-	$9.40\ 10^{-7}$	-	-	0	$8.80\ 10^{-2}$
Y-91	$3.88\ 10^{-9}$	$9.57\ 10^{-6}$	$8.29\ 10^{-15}$	$9.57\ 10^{-6}$	-	$8.29\ 10^{-15}$	-	-	0	$9.57\ 10^{-6}$
Zn-65	$4.64\ 10^{-2}$	$9.24\ 10^{-1}$	$4.02\ 10^{-3}$	$9.28\ 10^{-1}$	$7.33\ 10^{-2}$	$7.73\ 10^{-2}$	$3.91\ 10^{-2}$	$8.78\ 10^{-8}$	$1.12\ 10^{-1}$	$1.04\ 10^{0}$
Zr-93	$1.81\ 10^{-2}$	$2.14\ 10^{-1}$	$3.08\ 10^{-5}$	$2.14\ 10^{-1}$	$7.38\ 10^{-3}$	$7.41\ 10^{-3}$	$2.35\ 10^{-4}$	$1.53\ 10^{-7}$	$7.62\ 10^{-3}$	$2.22\ 10^{-1}$
Zr-95	$4.49\ 10^{-2}$	$1.07\ 10^{-1}$	$4.19\ 10^{-3}$	$1.11\ 10^{-1}$	-	$4.19\ 10^{-3}$	-	-	0	$1.11\ 10^{-1}$
Total	$5.65\ 10^{2}$	$1.01\ 10^{2}$	$2.05\ 10^{1}$	$1.22\ 10^{2}$	$6.18\ 10^{2}$	$6.39\ 10^{2}$	$9.30\ 10^{2}$	$2.76\ 10^{2}$	$1.82\ 10^{3}$	$1.95\ 10^{3}$

A2 Volumes

Table A.3: Volumes of processed waste in the trenches

	Processed waste volume (m^3)
Trench 1	40,400
Trench 2	93,700
Trench 3	119,000
Trench 4	148,000
Trench 5	82,200
Trench 6	93,600
Trench 7	238,000
Total trench	815,000

Table A.4: Summary of waste and emplaced volumes in the Stage 3 LLW-only Reference Inventory

Volume type	Volume (m^3)									
	Total Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward	Total Vaults
Raw waste volume	$8.15\ 10^5$	$7.91\ 10^4$	$1.63\ 10^4$	$9.54\ 10^4$	$1.57\ 10^5$	$1.73\ 10^5$	$2.27\ 10^5$	$5.96\ 10^4$	$4.44\ 10^5$	$5.39\ 10^5$
Processed waste volume	$8.15\ 10^5$	$7.91\ 10^4$	$1.63\ 10^4$	$9.54\ 10^4$	$6.79\ 10^4$	$8.42\ 10^4$	$6.81\ 10^4$	$2.44\ 10^4$	$1.60\ 10^5$	$2.56\ 10^5$
Conditioned waste volume	-	$1.71\ 10^5$	$3.50\ 10^4$	$2.06\ 10^5$	$1.59\ 10^5$	$1.94\ 10^5$	$1.59\ 10^5$	$5.70\ 10^4$	$3.75\ 10^5$	$5.82\ 10^5$
Packaged waste volume	-	$1.96\ 10^5$	$3.85\ 10^4$	$2.34\ 10^5$	$1.60\ 10^5$	$1.98\ 10^5$	$1.59\ 10^5$	$5.70\ 10^4$	$3.76\ 10^5$	$6.10\ 10^5$
Emplaced waste volume	-	$3.27\ 10^5$	$6.42\ 10^4$	$3.91\ 10^5$	$2.17\ 10^5$	$2.81\ 10^5$	$1.99\ 10^5$	$7.12\ 10^4$	$4.87\ 10^5$	$8.77\ 10^5$

A3 Materials

Table A.5: Material volumes in the trenches

Material	Volume (m^3)							
	Trench 1	Trench 2	Trench 3	Trench 4	Trench 5	Trench 6	Trench 7	Total
Stainless steel	$1.64\ 10^3$	$5.43\ 10^3$	$1.01\ 10^4$	$5.66\ 10^3$	$4.39\ 10^3$	$5.38\ 10^3$	$1.58\ 10^4$	$4.84\ 10^4$
Other ferrous metal	$8.46\ 10^3$	$1.75\ 10^4$	$2.50\ 10^4$	$2.32\ 10^4$	$1.78\ 10^4$	$2.02\ 10^4$	$5.59\ 10^4$	$1.68\ 10^5$
Unknown ferrous metal	$1.15\ 10^2$	$8.04\ 10^2$	$8.48\ 10^2$	$4.54\ 10^2$	$3.02\ 10^2$	$4.75\ 10^2$	$4.10\ 10^2$	$3.41\ 10^3$
Magnox	$3.76\ 10^0$	$5.44\ 10^1$	$4.77\ 10^1$	$2.72\ 10^1$	$2.06\ 10^1$	$2.71\ 10^1$	$2.28\ 10^1$	$2.04\ 10^2$
Zircaloy	$2.75\ 10^0$	$3.84\ 10^1$	$1.37\ 10^1$	$3.57\ 10^0$	$2.75\ 10^0$	$3.50\ 10^0$	$2.76\ 10^1$	$9.23\ 10^1$
Brass	$7.39\ 10^1$	$2.40\ 10^2$	$2.92\ 10^2$	$2.41\ 10^2$	$2.10\ 10^2$	$2.12\ 10^2$	$7.78\ 10^2$	$2.05\ 10^3$
Bronze	$2.99\ 10^0$	$4.10\ 10^1$	$1.81\ 10^1$	$7.01\ 10^0$	$7.02\ 10^0$	$6.35\ 10^0$	$5.87\ 10^0$	$8.83\ 10^1$
Inconel	$1.98\ 10^1$	$1.52\ 10^2$	$9.02\ 10^1$	$4.19\ 10^1$	$2.99\ 10^1$	$4.74\ 10^1$	$5.07\ 10^1$	$4.32\ 10^2$
Nimonic	$1.88\ 10^0$	$3.74\ 10^1$	$1.33\ 10^1$	$3.31\ 10^0$	$2.59\ 10^0$	$2.35\ 10^0$	$3.09\ 10^0$	$6.39\ 10^1$
Stellite	$1.88\ 10^0$	$3.74\ 10^1$	$1.33\ 10^1$	$3.31\ 10^0$	$2.59\ 10^0$	$2.35\ 10^0$	$3.09\ 10^0$	$6.39\ 10^1$

Material	Volume (m^3)							
	Trench 1	Trench 2	Trench 3	Trench 4	Trench 5	Trench 6	Trench 7	Total
Boral	$2.04\ 10^{0}$	$3.82\ 10^{1}$	$1.38\ 10^{1}$	$3.59\ 10^{0}$	$2.79\ 10^{0}$	$2.68\ 10^{0}$	$3.43\ 10^{0}$	$6.65\ 10^{1}$
Dural	$1.91\ 10^{0}$	$3.74\ 10^{1}$	$1.33\ 10^{1}$	$3.31\ 10^{0}$	$2.59\ 10^{0}$	$2.35\ 10^{0}$	$3.09\ 10^{0}$	$6.40\ 10^{1}$
Monel	$2.65\ 10^{0}$	$3.97\ 10^{1}$	$1.73\ 10^{1}$	$6.17\ 10^{0}$	$6.14\ 10^{0}$	$5.10\ 10^{0}$	$4.35\ 10^{0}$	$8.14\ 10^{1}$
Aluminium metal	$1.09\ 10^{3}$	$1.93\ 10^{3}$	$2.28\ 10^{3}$	$1.95\ 10^{3}$	$1.65\ 10^{3}$	$1.81\ 10^{3}$	$5.42\ 10^{3}$	$1.61\ 10^{4}$
Nickel metal	$5.26\ 10^{1}$	$2.03\ 10^{2}$	$3.27\ 10^{2}$	$1.76\ 10^{2}$	$1.31\ 10^{2}$	$1.57\ 10^{2}$	$4.63\ 10^{2}$	$1.51\ 10^{3}$
Copper metal	$2.27\ 10^{2}$	$6.86\ 10^{2}$	$9.27\ 10^{2}$	$5.34\ 10^{2}$	$4.12\ 10^{2}$	$5.58\ 10^{2}$	$1.90\ 10^{3}$	$5.24\ 10^{3}$
Zinc metal	$2.27\ 10^{1}$	$1.07\ 10^{2}$	$9.93\ 10^{1}$	$7.23\ 10^{1}$	$7.40\ 10^{1}$	$7.14\ 10^{1}$	$2.32\ 10^{2}$	$6.79\ 10^{2}$
Molybdenum metal	$1.87\ 10^{0}$	$3.74\ 10^{1}$	$1.77\ 10^{1}$	$5.24\ 10^{0}$	$4.83\ 10^{0}$	$5.24\ 10^{0}$	$5.30\ 10^{0}$	$7.76\ 10^{1}$
Lead metal	$7.49\ 10^{1}$	$2.96\ 10^{2}$	$4.24\ 10^{2}$	$3.22\ 10^{2}$	$2.87\ 10^{2}$	$3.53\ 10^{2}$	$1.03\ 10^{3}$	$2.79\ 10^{3}$
Uranium metal	$5.89\ 10^{0}$	$6.25\ 10^{1}$	$4.07\ 10^{1}$	$1.37\ 10^{1}$	$9.16\ 10^{0}$	$1.30\ 10^{1}$	$1.37\ 10^{1}$	$1.59\ 10^{2}$
Other Metals	$6.90\ 10^{1}$	$2.06\ 10^{2}$	$1.04\ 10^{2}$	$1.25\ 10^{2}$	$1.20\ 10^{2}$	$1.94\ 10^{2}$	$3.61\ 10^{2}$	$1.18\ 10^{3}$
Unknown metals	$5.83\ 10^{2}$	$2.71\ 10^{3}$	$2.37\ 10^{3}$	$1.28\ 10^{3}$	$8.96\ 10^{2}$	$1.59\ 10^{3}$	$3.15\ 10^{3}$	$1.26\ 10^{4}$
Inorganic Ion exchangers	$4.05\ 10^{0}$	$5.27\ 10^{1}$	$3.65\ 10^{1}$	$1.89\ 10^{1}$	$1.62\ 10^{1}$	$1.75\ 10^{1}$	$1.39\ 10^{1}$	$1.60\ 10^{2}$

Material	Volume (m^3)							
	Trench 1	Trench 2	Trench 3	Trench 4	Trench 5	Trench 6	Trench 7	Total
Glass	2.75 10^{2}	8.50 10^{2}	1.08 10^{3}	9.54 10^{2}	8.98 10^{2}	9.39 10^{2}	2.00 10^{3}	7.00 10^{3}
Ceramic	1.73 10^{2}	4.25 10^{2}	4.33 10^{2}	3.85 10^{2}	3.35 10^{2}	3.38 10^{2}	1.01 10^{3}	3.10 10^{3}
Asbestos	5.47 10^{2}	8.15 10^{2}	6.67 10^{2}	1.72 10^{3}	6.02 10^{2}	6.02 10^{2}	2.05 10^{3}	7.00 10^{3}
Rubble	4.03 10^{3}	1.35 10^{4}	1.70 10^{4}	2.83 10^{4}	1.39 10^{4}	1.35 10^{4}	3.22 10^{4}	1.22 10^{5}
Block cement	5.62 10^{2}	2.77 10^{3}	2.31 10^{3}	2.61 10^{3}	1.27 10^{3}	1.47 10^{3}	2.15 10^{3}	1.31 10^{4}
Other inorganics	1.14 10^{4}	6.21 10^{3}	3.31 10^{3}	6.83 10^{3}	4.96 10^{3}	8.28 10^{3}	3.29 10^{3}	4.43 10^{4}
Unknown inorganics	1.40 10^{1}	1.14 10^{2}	6.44 10^{1}	3.28 10^{1}	2.22 10^{1}	3.53 10^{1}	3.78 10^{1}	3.21 10^{2}
Paper and cotton	5.23 10^{2}	1.62 10^{3}	2.39 10^{3}	1.71 10^{3}	1.37 10^{3}	1.75 10^{3}	3.33 10^{3}	1.27 10^{4}
Wood	1.26 10^{3}	4.63 10^{3}	6.14 10^{3}	7.49 10^{3}	3.94 10^{3}	4.54 10^{3}	1.23 10^{4}	4.03 10^{4}
Other cellulosics	3.95 10^{3}	1.38 10^{4}	1.80 10^{4}	8.93 10^{3}	6.61 10^{3}	1.09 10^{4}	4.33 10^{4}	1.05 10^{5}
Unknown cellulosics	5.84 10^{1}	2.49 10^{2}	3.03 10^{2}	1.76 10^{2}	1.39 10^{2}	2.42 10^{2}	3.44 10^{2}	1.51 10^{3}
Halogenated plastics	1.66 10^{3}	5.86 10^{3}	7.59 10^{3}	4.41 10^{3}	3.21 10^{3}	5.15 10^{3}	1.91 10^{4}	4.70 10^{4}
Condensation polymers	4.64 10^{1}	1.76 10^{2}	2.20 10^{2}	2.38 10^{2}	2.90 10^{2}	4.38 10^{2}	6.59 10^{2}	2.07 10^{3}

Material	Volume (m^3)							
	Trench 1	Trench 2	Trench 3	Trench 4	Trench 5	Trench 6	Trench 7	Total
Thermoplastics	$7.35\ 10^2$	$2.69\ 10^3$	$4.02\ 10^3$	$2.24\ 10^3$	$1.59\ 10^3$	$2.47\ 10^3$	$9.40\ 10^3$	$2.31\ 10^4$
Unknown non-halogenated plastics	$1.71\ 10^2$	$5.59\ 10^2$	$4.31\ 10^2$	$3.86\ 10^2$	$3.49\ 10^2$	$5.30\ 10^2$	$8.09\ 10^2$	$3.24\ 10^3$
Unknown plastics	$9.30\ 10^0$	$9.81\ 10^1$	$9.82\ 10^1$	$7.18\ 10^1$	$4.69\ 10^1$	$4.95\ 10^1$	$9.12\ 10^1$	$4.65\ 10^2$
Halogenated rubber	$3.71\ 10^2$	$1.33\ 10^3$	$1.59\ 10^3$	$9.40\ 10^2$	$6.53\ 10^2$	$1.02\ 10^3$	$3.65\ 10^3$	$9.55\ 10^3$
Non-halogenated rubber	$1.78\ 10^2$	$5.97\ 10^2$	$7.79\ 10^2$	$4.96\ 10^2$	$3.55\ 10^2$	$5.59\ 10^2$	$1.44\ 10^3$	$4.40\ 10^3$
Unknown rubber	$4.60\ 10^2$	$1.64\ 10^3$	$1.88\ 10^3$	$1.07\ 10^3$	$8.46\ 10^2$	$1.36\ 10^3$	$5.81\ 10^3$	$1.31\ 10^4$
Ion exchange resins	$1.14\ 10^2$	$2.16\ 10^2$	$2.75\ 10^2$	$1.85\ 10^2$	$2.13\ 10^2$	$1.72\ 10^2$	$9.06\ 10^1$	$1.27\ 10^3$
Other organics	$9.85\ 10^1$	$4.06\ 10^2$	$6.44\ 10^2$	$4.42\ 10^2$	$3.85\ 10^2$	$5.66\ 10^2$	$9.03\ 10^2$	$3.44\ 10^3$
Unknown organics	$5.11\ 10^1$	$1.78\ 10^2$	$2.12\ 10^2$	$1.25\ 10^2$	$9.95\ 10^1$	$1.48\ 10^2$	$2.78\ 10^2$	$1.09\ 10^3$
Complexants	$5.61\ 10^1$	$2.11\ 10^2$	$2.74\ 10^2$	$2.24\ 10^2$	$2.17\ 10^2$	$1.83\ 10^2$	$4.31\ 10^2$	$1.60\ 10^3$
Graphite	$7.55\ 10^1$	$2.74\ 10^2$	$2.72\ 10^2$	$1.81\ 10^2$	$1.54\ 10^2$	$2.42\ 10^2$	$9.58\ 10^2$	$2.16\ 10^3$
Soil	$6.62\ 10^2$	$2.49\ 10^3$	$3.97\ 10^3$	$4.20\ 10^4$	$1.22\ 10^4$	$5.54\ 10^3$	$5.14\ 10^3$	$7.20\ 10^4$

Material	Volume (m^3)							
	Trench 1	Trench 2	Trench 3	Trench 4	Trench 5	Trench 6	Trench 7	Total
Biological material	$2.04\ 10^{0}$	$3.78\ 10^{1}$	$1.22\ 10^{1}$	$2.91\ 10^{0}$	$2.23\ 10^{0}$	$2.28\ 10^{0}$	$3.57\ 10^{0}$	$6.30\ 10^{1}$
Aqueous liquid	$7.14\ 10^{1}$	$1.87\ 10^{2}$	$2.21\ 10^{2}$	$1.32\ 10^{2}$	$1.04\ 10^{2}$	$1.55\ 10^{2}$	$2.84\ 10^{2}$	$1.15\ 10^{3}$
Oil	$5.11\ 10^{1}$	$1.78\ 10^{2}$	$2.11\ 10^{2}$	$1.25\ 10^{2}$	$9.92\ 10^{1}$	$1.47\ 10^{2}$	$2.77\ 10^{2}$	$1.09\ 10^{3}$
Miscellaneous liquid	$1.84\ 10^{1}$	$8.78\ 10^{1}$	$8.57\ 10^{1}$	$9.94\ 10^{1}$	$1.43\ 10^{2}$	$7.32\ 10^{1}$	$2.07\ 10^{2}$	$7.15\ 10^{2}$
Unknown material	$3.03\ 10^{2}$	$7.86\ 10^{2}$	$1.27\ 10^{3}$	$1.22\ 10^{3}$	$7.83\ 10^{2}$	$1.06\ 10^{3}$	$1.05\ 10^{3}$	$6.47\ 10^{3}$
Total volume	$4.04\ 10^{4}$	$9.37\ 10^{4}$	$1.19\ 10^{5}$	$1.48\ 10^{5}$	$8.22\ 10^{4}$	$9.36\ 10^{4}$	$2.38\ 10^{5}$	$8.15\ 10^{5}$

Table A.6: Material masses in the vaults for the Stage 3 Reference Inventory. Tiered material groups are given in bold, which consist of the sum of the materials given in italic beneath them

Materials	Mass (t)								
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward Vaults	Total vaults
Total processed waste mass	$1.43\ 10^{5}$	$2.55\ 10^{4}$	$1.69\ 10^{5}$	$9.72\ 10^{4}$	$1.23\ 10^{5}$	$1.10\ 10^{5}$	$3.15\ 10^{4}$	$2.39\ 10^{5}$	$4.08\ 10^{5}$

Materials	Mass (t)								
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward Vaults	Total vaults
Total stage 2 conditioned waste mass	$3.10\ 10^{5}$	$5.93\ 10^{4}$	$3.69\ 10^{5}$	$2.46\ 10^{5}$	$3.06\ 10^{5}$	$2.60\ 10^{5}$	$8.52\ 10^{4}$	$5.91\ 10^{5}$	$9.60\ 10^{5}$
Total disposal unit (stage 2 packaged) waste mass	$3.41\ 10^{5}$	$6.54\ 10^{4}$	$4.07\ 10^{5}$	$2.71\ 10^{5}$	$3.37\ 10^{5}$	$2.85\ 10^{5}$	$9.42\ 10^{4}$	$6.50\ 10^{5}$	$1.06\ 10^{6}$
Metals									
Ferrous stainless steel	$3.71\ 10^{3}$	$3.88\ 10^{2}$	$4.10\ 10^{3}$	$6.51\ 10^{3}$	$6.90\ 10^{3}$	$1.76\ 10^{4}$	$2.88\ 10^{3}$	$2.70\ 10^{4}$	$3.11\ 10^{4}$
Ferrous excluding stainless steel (i.e. carbon steel)	$2.21\ 10^{4}$	$3.44\ 10^{3}$	$2.56\ 10^{4}$	$1.10\ 10^{4}$	$1.45\ 10^{4}$	$2.75\ 10^{4}$	$7.20\ 10^{3}$	$4.57\ 10^{4}$	$7.13\ 10^{4}$
Iron	$3.74\ 10^{2}$	$9.28\ 10^{2}$	$1.30\ 10^{3}$	$1.14\ 10^{3}$	$2.07\ 10^{3}$	$2.70\ 10^{2}$	$1.00\ 10^{1}$	$1.42\ 10^{3}$	$2.72\ 10^{3}$
Aluminium	$1.98\ 10^{3}$	$1.91\ 10^{2}$	$2.17\ 10^{3}$	$7.26\ 10^{2}$	$9.18\ 10^{2}$	$5.75\ 10^{2}$	$1.49\ 10^{0}$	$1.30\ 10^{3}$	$3.47\ 10^{3}$
Beryllium	$3.98\ 10^{-1}$	$6.80\ 10^{-2}$	$4.66\ 10^{-1}$	$8.92\ 10^{-1}$	$9.60\ 10^{-1}$	$9.96\ 10^{-3}$	0	$9.02\ 10^{-1}$	$1.37\ 10^{0}$
Cobalt	$1.81\ 10^{-1}$	$3.89\ 10^{-1}$	$5.69\ 10^{-1}$	$1.74\ 10^{1}$	$1.78\ 10^{1}$	$9.72\ 10^{-1}$	0	$1.84\ 10^{1}$	$1.89\ 10^{1}$

Materials	Mass (t)								
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward Vaults	Total vaults
Copper	$1.62\ 10^{3}$	$9.43\ 10^{1}$	$1.71\ 10^{3}$	$3.92\ 10^{2}$	$4.86\ 10^{2}$	$5.41\ 10^{2}$	$3.58\ 10^{0}$	$9.36\ 10^{2}$	$2.65\ 10^{3}$
Lead	$4.08\ 10^{3}$	$2.68\ 10^{2}$	$4.35\ 10^{3}$	$1.17\ 10^{3}$	$1.44\ 10^{3}$	$5.04\ 10^{3}$	$1.09\ 10^{1}$	$6.22\ 10^{3}$	$1.06\ 10^{4}$
Magnox	$6.69\ 10^{2}$	$6.08\ 10^{1}$	$7.30\ 10^{2}$	$3.48\ 10^{2}$	$4.08\ 10^{2}$	$8.82\ 10^{-1}$	0	$3.48\ 10^{2}$	$1.08\ 10^{3}$
Nickel	$9.62\ 10^{2}$	$4.51\ 10^{1}$	$1.01\ 10^{3}$	$3.64\ 10^{1}$	$8.15\ 10^{1}$	$8.07\ 10^{0}$	0	$4.45\ 10^{1}$	$1.05\ 10^{3}$
Titanium	$1.29\ 10^{-1}$	$5.45\ 10^{-1}$	$6.74\ 10^{-1}$	$6.50\ 10^{0}$	$7.05\ 10^{0}$	$5.20\ 10^{-1}$	0	$7.02\ 10^{0}$	$7.70\ 10^{0}$
Uranium	$8.85\ 10^{1}$	$7.55\ 10^{0}$	$9.61\ 10^{1}$	$1.34\ 10^{1}$	$2.10\ 10^{1}$	$2.61\ 10^{0}$	0	$1.60\ 10^{1}$	$1.12\ 10^{2}$
Zinc	$4.38\ 10^{2}$	$1.23\ 10^{1}$	$4.50\ 10^{2}$	$2.29\ 10^{2}$	$2.41\ 10^{2}$	$4.06\ 10^{1}$	$3.85\ 10^{-1}$	$2.70\ 10^{2}$	$7.20\ 10^{2}$
Zirconium	$6.45\ 10^{2}$	$1.09\ 10^{1}$	$6.56\ 10^{2}$	$6.29\ 10^{-2}$	$1.10\ 10^{1}$	$1.52\ 10^{-1}$	0	$2.15\ 10^{-1}$	$6.56\ 10^{2}$
Zirconium/Zircaloy	0	0	0	-	0	-	-	0	0
Other metals	$4.74\ 10^{3}$	$3.50\ 10^{1}$	$4.77\ 10^{3}$	$5.65\ 10^{2}$	$6.00\ 10^{2}$	$1.82\ 10^{3}$	$1.07\ 10^{3}$	$3.45\ 10^{3}$	$8.22\ 10^{3}$
Brass	$9.80\ 10^{2}$	$7.21\ 10^{0}$	$9.87\ 10^{2}$	-	$7.21\ 10^{0}$	-	-	0	$9.87\ 10^{2}$
Bronze	$4.69\ 10^{2}$	$3.44\ 10^{0}$	$4.72\ 10^{2}$	-	$3.44\ 10^{0}$	-	-	0	$4.72\ 10^{2}$

Materials	Mass (t)								
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward Vaults	Total vaults
Inconel	$9.55\ 10^{2}$	$6.97\ 10^{0}$	$9.62\ 10^{2}$	-	$6.97\ 10^{0}$	-	-	0	$9.62\ 10^{2}$
Nimonic	$7.13\ 10^{2}$	$5.20\ 10^{0}$	$7.18\ 10^{2}$	-	$5.20\ 10^{0}$	-	-	0	$7.18\ 10^{2}$
Stellite	$7.29\ 10^{2}$	$5.32\ 10^{0}$	$7.34\ 10^{2}$	-	$5.32\ 10^{0}$	-	-	0	$7.34\ 10^{2}$
Dural	$8.65\ 10^{1}$	$6.33\ 10^{-1}$	$8.71\ 10^{1}$	-	$6.33\ 10^{-1}$	-	-	0	$8.71\ 10^{1}$
Monel	$4.58\ 10^{2}$	$3.34\ 10^{0}$	$4.62\ 10^{2}$	-	$3.34\ 10^{0}$	-	-	0	$4.62\ 10^{2}$
Manganese	$5.52\ 10^{-2}$	$5.81\ 10^{-2}$	$1.13\ 10^{-1}$	-	$5.81\ 10^{-2}$	-	-	0	$1.13\ 10^{-1}$
Sodium	0	$1.20\ 10^{-5}$	$1.20\ 10^{-5}$	-	$1.20\ 10^{-5}$	-	-	0	$1.20\ 10^{-5}$
Neodymium	$2.16\ 10^{-2}$	0	$2.16\ 10^{-2}$	-	0	-	-	0	$2.16\ 10^{-2}$
Mazel	0	$2.52\ 10^{-1}$	$2.52\ 10^{-1}$	-	$2.52\ 10^{-1}$	-	-	0	$2.52\ 10^{-1}$
Unknown ferrous metal	$3.50\ 10^{2}$	$2.55\ 10^{0}$	$3.53\ 10^{2}$	-	$2.55\ 10^{0}$	-	-	0	$3.53\ 10^{2}$

Materials	Mass (t)								
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward Vaults	Total vaults
Unknown metals	1.27 10^{4}	2.62 10^{3}	1.54 10^{4}	-	2.62 10^{3}	-	-	0	1.54 10^{4}
Organics									
Total cellulosics	7.61 10^{3}	1.00 10^{3}	8.61 10^{3}	2.51 10^{3}	3.51 10^{3}	9.52 10^{2}	5.71 10^{1}	3.52 10^{3}	1.21 10^{4}
Paper and cotton	0	0	0	1.64 10^{3}	1.64 10^{3}	1.20 10^{2}	3.60 10^{1}	1.79 10^{3}	1.79 10^{3}
Wood	4.72 10^{3}	7.48 10^{2}	5.47 10^{3}	8.70 10^{2}	1.62 10^{3}	8.32 10^{2}	2.11 10^{1}	1.72 10^{3}	7.19 10^{3}
Paper	1.85 10^{3}	2.29 10^{2}	2.08 10^{3}	-	2.29 10^{2}	-	-	0	2.08 10^{3}
Other cellulosics	0	0	0	-	0	-	-	0	0
Unknown cellulosics	1.03 10^{3}	2.65 10^{1}	1.06 10^{3}	-	2.65 10^{1}	-	-	0	1.06 10^{3}

Materials	Mass (t)								
	Vault 8	**Disposed Vault 9 and 9a**	**Total disposed vaults**	**Forward Vault 9 and 9a**	**Total Vault 9 and 9a**	**Vault 10**	**Vault 11**	**Total Forward Vaults**	**Total vaults**
Halogenated plastics	$2.79\ 10^3$	$8.72\ 10^2$	$3.66\ 10^3$	$2.65\ 10^3$	$3.53\ 10^3$	$1.37\ 10^3$	$1.67\ 10^2$	$4.19\ 10^3$	$7.85\ 10^3$
Total non-halogenated plastics	$3.00\ 10^3$	$6.26\ 10^2$	$3.63\ 10^3$	$2.12\ 10^3$	$2.75\ 10^3$	$8.84\ 10^2$	$1.92\ 10^1$	$3.02\ 10^3$	$6.65\ 10^3$
Condensation polymers	$6.74\ 10^2$	$5.69\ 10^1$	$7.31\ 10^2$	$9.53\ 10^2$	$1.01\ 10^3$	$4.04\ 10^2$	$9.62\ 10^0$	$1.37\ 10^3$	$2.10\ 10^3$
Thermoplastics (other non-halogenated plastics)	$1.02\ 10^3$	$2.15\ 10^2$	$1.23\ 10^3$	$1.17\ 10^3$	$1.38\ 10^3$	$4.81\ 10^2$	$9.62\ 10^0$	$1.66\ 10^3$	$2.89\ 10^3$
Unknown non-halogenated plastics	$1.31\ 10^3$	$3.54\ 10^2$	$1.66\ 10^3$	-	$3.54\ 10^2$	-	-	0	$1.66\ 10^3$
Ion exchange resins	$3.30\ 10^2$	0	$3.30\ 10^2$	$4.52\ 10^2$	$4.52\ 10^2$	$1.38\ 10^{-1}$	0	$4.52\ 10^2$	$7.82\ 10^2$
Unknown plastics	$7.38\ 10^2$	$1.54\ 10^2$	$8.92\ 10^2$	-	$1.54\ 10^2$	-	-	0	$8.92\ 10^2$

Materials	Mass (t)								
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward Vaults	Total vaults
Total rubber	$5.68\ 10^{3}$	$9.78\ 10^{2}$	$6.66\ 10^{3}$	$1.22\ 10^{3}$	$2.20\ 10^{3}$	$7.52\ 10^{2}$	$4.62\ 10^{0}$	$1.98\ 10^{3}$	$8.64\ 10^{3}$
Halogenated rubber	$7.72\ 10^{2}$	$5.79\ 10^{1}$	$8.30\ 10^{2}$	$6.76\ 10^{2}$	$7.34\ 10^{2}$	$3.89\ 10^{2}$	$2.31\ 10^{0}$	$1.07\ 10^{3}$	$1.90\ 10^{3}$
Non-halogenated rubber	$8.44\ 10^{2}$	$1.02\ 10^{2}$	$9.45\ 10^{2}$	$5.47\ 10^{2}$	$6.49\ 10^{2}$	$3.63\ 10^{2}$	$2.31\ 10^{0}$	$9.13\ 10^{2}$	$1.86\ 10^{3}$
Nitrile rubber	$8.92\ 10^{-2}$	0	$8.92\ 10^{-2}$	-	0	-	-	0	$8.92\ 10^{-2}$
Unknown rubber	$4.06\ 10^{3}$	$8.19\ 10^{2}$	$4.88\ 10^{3}$	-	$8.19\ 10^{2}$	-	-	0	$4.88\ 10^{3}$
Hydrocarbons	$5.73\ 10^{1}$	$3.27\ 10^{2}$	$3.84\ 10^{2}$	$2.90\ 10^{2}$	$6.16\ 10^{2}$	$1.78\ 10^{2}$	$1.16\ 10^{0}$	$4.69\ 10^{2}$	$8.53\ 10^{2}$
Oils grease	0	0	0	$8.99\ 10^{1}$	$8.99\ 10^{1}$	$3.04\ 10^{1}$	$1.28\ 10^{-2}$	$1.20\ 10^{2}$	$1.20\ 10^{2}$
Fuel	0	0	0	$1.08\ 10^{-1}$	$1.08\ 10^{-1}$	0	0	$1.08\ 10^{-1}$	$1.08\ 10^{-1}$
Asphalt tarmac (cont. coal tar)	$5.56\ 10^{1}$	$2.92\ 10^{2}$	$3.47\ 10^{2}$	$7.73\ 10^{1}$	$3.69\ 10^{2}$	$4.14\ 10^{1}$	$8.48\ 10^{-1}$	$1.19\ 10^{2}$	$4.67\ 10^{2}$
Asphalt tarmac	0	$1.35\ 10^{-1}$	$1.35\ 10^{-1}$	$4.36\ 10^{1}$	$4.38\ 10^{1}$	$2.10\ 10^{1}$	$1.70\ 10^{-1}$	$6.48\ 10^{1}$	$6.49\ 10^{1}$

Materials	Mass (t)								
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward Vaults	Total vaults
Bitumen	$1.04\ 10^{0}$	$3.17\ 10^{1}$	$3.27\ 10^{1}$	$7.86\ 10^{1}$	$1.10\ 10^{2}$	$8.57\ 10^{1}$	$1.29\ 10^{-1}$	$1.64\ 10^{2}$	$1.97\ 10^{2}$
Coal tar	0	$2.64\ 10^{0}$	$2.64\ 10^{0}$	-	$2.64\ 10^{0}$	-	-	0	$2.64\ 10^{0}$
Other hydrocarbons	$3.03\ 10^{-1}$	$4.61\ 10^{-1}$	$7.63\ 10^{-1}$	$1.08\ 10^{-1}$	$5.69\ 10^{-1}$	0	0	$1.08\ 10^{-1}$	$8.71\ 10^{-1}$
Other organics	$5.68\ 10^{3}$	$1.34\ 10^{3}$	$7.02\ 10^{3}$	$8.29\ 10^{2}$	$2.17\ 10^{3}$	$1.07\ 10^{3}$	$5.59\ 10^{2}$	$2.46\ 10^{3}$	$9.48\ 10^{3}$
Unknown organics	$7.84\ 10^{2}$	$6.94\ 10^{1}$	$8.53\ 10^{2}$	-	$6.94\ 10^{1}$	-	-	0	$8.53\ 10^{2}$
Other materials (Group defined in UKRWI. The mass of materials in this group should be included when calculating a total mass.)									
Inorganic ion exchange	$1.30\ 10^{3}$	$7.12\ 10^{1}$	$1.37\ 10^{3}$	$8.77\ 10^{0}$	$8.00\ 10^{1}$	$8.81\ 10^{-1}$	0	$9.65\ 10^{0}$	$1.38\ 10^{3}$
Inorganic sludge & flocs	$3.80\ 10^{2}$	$2.48\ 10^{2}$	$6.28\ 10^{2}$	$8.22\ 10^{2}$	$1.07\ 10^{3}$	$4.04\ 10^{3}$	$1.26\ 10^{3}$	$6.12\ 10^{3}$	$6.75\ 10^{3}$
Unknown inorganics	$1.36\ 10^{3}$	$4.39\ 10^{1}$	$1.41\ 10^{3}$	-	$4.39\ 10^{1}$	-	-	0	$1.41\ 10^{3}$
Soil	$1.60\ 10^{4}$	$2.42\ 10^{3}$	$1.84\ 10^{4}$	$5.84\ 10^{2}$	$3.00\ 10^{3}$	$2.17\ 10^{3}$	$6.84\ 10^{2}$	$3.43\ 10^{3}$	$2.18\ 10^{4}$
Rubble	$1.10\ 10^{4}$	$2.11\ 10^{3}$	$1.31\ 10^{4}$	$3.70\ 10^{3}$	$5.81\ 10^{3}$	$2.53\ 10^{3}$	$6.91\ 10^{2}$	$6.92\ 10^{3}$	$2.00\ 10^{4}$

Materials	Mass (t)								
	Vault 8	**Disposed Vault 9 and 9a**	**Total disposed vaults**	**Forward Vault 9 and 9a**	**Total Vault 9 and 9a**	**Vault 10**	**Vault 11**	**Total Forward Vaults**	**Total vaults**
Cement/concrete	$7.98\ 10^{3}$	$1.97\ 10^{3}$	$9.94\ 10^{3}$	$5.51\ 10^{4}$	$5.70\ 10^{4}$	$2.23\ 10^{4}$	$1.36\ 10^{4}$	$9.10\ 10^{4}$	$1.01\ 10^{5}$
Sand	$3.78\ 10^{2}$	$9.31\ 10^{1}$	$4.71\ 10^{2}$	$4.84\ 10^{1}$	$1.41\ 10^{2}$	$1.97\ 10^{-2}$	0	$4.84\ 10^{1}$	$5.20\ 10^{2}$
Glass/ceramics	$3.16\ 10^{3}$	$4.16\ 10^{2}$	$3.58\ 10^{3}$	$1.58\ 10^{2}$	$5.74\ 10^{2}$	$1.56\ 10^{2}$	$2.20\ 10^{0}$	$3.17\ 10^{2}$	$3.89\ 10^{3}$
Graphite	$4.59\ 10^{2}$	$8.19\ 10^{1}$	$5.41\ 10^{2}$	$4.21\ 10^{2}$	$5.03\ 10^{2}$	$5.66\ 10^{3}$	$3.34\ 10^{3}$	$9.43\ 10^{3}$	$9.97\ 10^{3}$
Desiccant	$1.28\ 10^{2}$	$5.71\ 10^{0}$	$1.33\ 10^{2}$	$4.69\ 10^{2}$	$4.75\ 10^{2}$	$3.52\ 10^{-3}$	0	$4.69\ 10^{2}$	$6.02\ 10^{2}$
Total asbestos	$2.47\ 10^{3}$	$3.77\ 10^{2}$	$2.84\ 10^{3}$	$4.30\ 10^{2}$	$8.07\ 10^{2}$	$1.65\ 10^{2}$	$4.77\ 10^{0}$	$5.99\ 10^{2}$	$3.44\ 10^{3}$
Asbestos (no breakdown available)	$2.03\ 10^{3}$	$3.58\ 10^{2}$	$2.39\ 10^{3}$	0	$3.58\ 10^{2}$	-	-	0	$2.39\ 10^{3}$
Non/low friable	$9.97\ 10^{-1}$	$6.41\ 10^{0}$	$7.41\ 10^{0}$	$2.32\ 10^{2}$	$2.38\ 10^{2}$	$1.21\ 10^{2}$	$3.90\ 10^{0}$	$3.56\ 10^{2}$	$3.64\ 10^{2}$
Moderately friable	$2.63\ 10^{-1}$	$1.29\ 10^{0}$	$1.55\ 10^{0}$	$1.19\ 10^{2}$	$1.20\ 10^{2}$	$2.34\ 10^{1}$	$8.48\ 10^{-1}$	$1.43\ 10^{2}$	$1.45\ 10^{2}$
Highly friable	$2.24\ 10^{-2}$	$1.25\ 10^{-1}$	$1.47\ 10^{-1}$	$7.88\ 10^{1}$	$7.90\ 10^{1}$	$2.10\ 10^{1}$	$2.35\ 10^{-2}$	$9.98\ 10^{1}$	$1.00\ 10^{2}$
Amosite	$1.84\ 10^{2}$	$1.31\ 10^{0}$	$1.86\ 10^{2}$	-	$1.31\ 10^{0}$	-	-	0	$1.86\ 10^{2}$

Materials	Mass (t)								
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward Vaults	Total vaults
Crocidolite	$7.53\ 10^{0}$	$5.33\ 10^{-2}$	$7.59\ 10^{0}$	-	$5.33\ 10^{-2}$	-	-	0	$7.59\ 10^{0}$
Chrysotile	$2.40\ 10^{2}$	$1.00\ 10^{1}$	$2.50\ 10^{2}$	-	$1.00\ 10^{1}$	-	-	0	$2.50\ 10^{2}$
Aqueous liquid volume	$1.02\ 10^{3}$	$1.39\ 10^{2}$	$1.16\ 10^{3}$	$4.44\ 10^{1}$	$1.83\ 10^{2}$	$1.19\ 10^{-1}$	0	$4.45\ 10^{1}$	$1.20\ 10^{3}$
Non-aqueous liquid volume	$4.60\ 10^{2}$	$1.68\ 10^{1}$	$4.77\ 10^{2}$	0	$1.68\ 10^{1}$	0	0	0	$4.77\ 10^{2}$
Hydrated lime	$4.01\ 10^{1}$	0	$4.01\ 10^{1}$	-	0	-	-	0	$4.01\ 10^{1}$
Silt, sand and soil	$1.10\ 10^{-3}$	0	$1.10\ 10^{-3}$	-	0	-	-	0	$1.10\ 10^{-3}$
Concrete/rubble	$1.92\ 10^{3}$	$2.51\ 10^{2}$	$2.17\ 10^{3}$	-	$2.51\ 10^{2}$	-	-	0	$2.17\ 10^{3}$
Powder/ash	$4.84\ 10^{2}$	$1.42\ 10^{2}$	$6.26\ 10^{2}$	$5.71\ 10^{1}$	$1.99\ 10^{2}$	$5.99\ 10^{0}$	0	$6.31\ 10^{1}$	$6.89\ 10^{2}$
Not declared	-	-	0	$3.13\ 10^{3}$	$3.13\ 10^{3}$	$1.46\ 10^{4}$	$8.46\ 10^{-1}$	$1.78\ 10^{4}$	$1.78\ 10^{4}$
Other UKRWI (Includes UKRWI groups 'Materials of interest for waste acceptance', 'Hazardous substances / non-hazardous pollutants'. For forward data, the mass of materials in this group should not be included when calculating a total mass.)									
Fluorides	$1.49\ 10^{-2}$	$5.35\ 10^{-2}$	$6.84\ 10^{-2}$	$4.88\ 10^{2}$	$4.89\ 10^{2}$	$2.34\ 10^{1}$	0	$5.12\ 10^{2}$	$5.12\ 10^{2}$

Materials	Mass (t)								
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward Vaults	Total vaults
Chlorides	0	0	0	$4.89\ 10^{2}$	$4.89\ 10^{2}$	$2.34\ 10^{1}$	0	$5.13\ 10^{2}$	$5.13\ 10^{2}$
Iodides	0	0	0	$4.88\ 10^{2}$	$4.88\ 10^{2}$	$2.34\ 10^{1}$	0	$5.12\ 10^{2}$	$5.12\ 10^{2}$
Cyanides	0	0	0	0	0	0	0	0	0
Carbonates	0	0	0	$9.74\ 10^{2}$	$9.74\ 10^{2}$	$4.66\ 10^{1}$	0	$1.02\ 10^{3}$	$1.02\ 10^{3}$
Nitrates	0	0	0	$4.89\ 10^{2}$	$4.89\ 10^{2}$	$2.35\ 10^{1}$	0	$5.13\ 10^{2}$	$5.13\ 10^{2}$
Nitrites	0	0	0	$4.86\ 10^{2}$	$4.86\ 10^{2}$	$2.32\ 10^{1}$	0	$5.09\ 10^{2}$	$5.09\ 10^{2}$
Phosphates	$3.44\ 10^{-3}$	$5.00\ 10^{-2}$	$5.34\ 10^{-2}$	$4.89\ 10^{2}$	$4.89\ 10^{2}$	$2.34\ 10^{1}$	0	$5.12\ 10^{2}$	$5.12\ 10^{2}$
Sulphates	0	0	0	$9.74\ 10^{2}$	$9.74\ 10^{2}$	$4.67\ 10^{1}$	0	$1.02\ 10^{3}$	$1.02\ 10^{3}$
Sulphides	0	0	0	$4.89\ 10^{2}$	$4.89\ 10^{2}$	$2.35\ 10^{1}$	0	$5.12\ 10^{2}$	$5.12\ 10^{2}$
Combustible metals	0	0	0	$2.27\ 10^{2}$	$2.27\ 10^{2}$	$3.94\ 10^{-1}$	0	$2.28\ 10^{2}$	$2.28\ 10^{2}$
Low flash point liquids	0	0	0	$2.01\ 10^{-2}$	$2.01\ 10^{-2}$	0	0	$2.01\ 10^{-2}$	$2.01\ 10^{-2}$
Explosive materials	0	0	0	$4.02\ 10^{-4}$	$4.02\ 10^{-4}$	0	0	$4.02\ 10^{-4}$	$4.02\ 10^{-4}$

Materials	Mass (t)								
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward Vaults	Total vaults
Phosphorus	0	0	0	$4.14\ 10^{-4}$	$4.14\ 10^{-4}$	$2.41\ 10^{-6}$	0	$4.16\ 10^{-4}$	$4.16\ 10^{-4}$
Hydrides	0	0	0	$4.02\ 10^{-4}$	$4.02\ 10^{-4}$	0	0	$4.02\ 10^{-4}$	$4.02\ 10^{-4}$
Biodegradable materials	$1.33\ 10^{2}$	$2.71\ 10^{1}$	$1.60\ 10^{2}$	$8.16\ 10^{2}$	$8.43\ 10^{2}$	$6.17\ 10^{2}$	$2.43\ 10^{1}$	$1.46\ 10^{3}$	$1.62\ 10^{3}$
Putrescible	$1.11\ 10^{1}$	$1.90\ 10^{0}$	$1.30\ 10^{1}$	$2.14\ 10^{2}$	$2.16\ 10^{2}$	$8.17\ 10^{1}$	$2.78\ 10^{0}$	$2.99\ 10^{2}$	$3.12\ 10^{2}$
Non-putrescible	$1.22\ 10^{2}$	$2.52\ 10^{1}$	$1.47\ 10^{2}$	$6.01\ 10^{2}$	$6.26\ 10^{2}$	$5.36\ 10^{2}$	$2.15\ 10^{1}$	$1.16\ 10^{3}$	$1.31\ 10^{3}$
Biological pathogenic	0	0	0	$4.55\ 10^{-3}$	$4.55\ 10^{-3}$	0	0	$4.55\ 10^{-3}$	$4.55\ 10^{-3}$
Pyrophoric	0	0	0	$4.02\ 10^{-4}$	$4.02\ 10^{-4}$	0	0	$4.02\ 10^{-4}$	$4.02\ 10^{-4}$
Strong oxidising	0	0	0	$4.02\ 10^{-4}$	$4.02\ 10^{-4}$	0	0	$4.02\ 10^{-4}$	$4.02\ 10^{-4}$
Generating toxic gases	0	0	0	$4.02\ 10^{-4}$	$4.02\ 10^{-4}$	0	0	$4.02\ 10^{-4}$	$4.02\ 10^{-4}$
Water reactive	0	0	0	$8.64\ 10^{2}$	$8.64\ 10^{2}$	$9.88\ 10^{1}$	$1.45\ 10^{0}$	$9.64\ 10^{2}$	$9.64\ 10^{2}$
Active particles	0	0	0	0	0	0	0	0	0

Materials	Mass (t)								
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward Vaults	Total vaults
Soluble solids	0	0	0	0	0	0	0	0	0
Acrylamide	0	0	0	0	0	0	0	0	0
Benzene	0	$3.80\ 10^{-8}$	$3.80\ 10^{-8}$	$2.14\ 10^{-4}$	$2.14\ 10^{-4}$	$2.09\ 10^{-3}$	0	$2.31\ 10^{-3}$	$2.31\ 10^{-3}$
Chlorinated solvents	0	0	0	0	0	0	0	0	0
Formaldehyde	0	0	0	0	0	0	0	0	0
Organometals	0	0	0	0	0	0	0	0	0
Phenol	0	$3.75\ 10^{-6}$	$3.75\ 10^{-6}$	0	$3.75\ 10^{-6}$	0	0	0	$3.75\ 10^{-6}$
Styrene	0	0	0	0	0	0	0	0	0
Tri-butyl phosphate	0	$2.88\ 10^{-2}$	$2.88\ 10^{-2}$	$2.38\ 10^{-1}$	$2.67\ 10^{-1}$	$3.05\ 10^{-2}$	$4.85\ 10^{-4}$	$2.69\ 10^{-1}$	$2.98\ 10^{-1}$
Other organophosphates	0	0	0	0	0	0	0	0	0
Vinyl chloride	$2.02\ 10^{-3}$	$4.80\ 10^{-1}$	$4.82\ 10^{-1}$	$1.09\ 10^{1}$	$1.13\ 10^{1}$	0	0	$1.09\ 10^{1}$	$1.14\ 10^{1}$

Materials	Mass (t)								
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward Vaults	Total vaults
Arsenic	$9.75\ 10^{-9}$	$2.02\ 10^{-3}$	$2.02\ 10^{-3}$	$3.68\ 10^{-3}$	$5.70\ 10^{-3}$	$3.59\ 10^{-2}$	0	$3.96\ 10^{-2}$	$4.16\ 10^{-2}$
Barium	0	0	0	0	0	0	0	0	0
Boron	$1.18\ 10^{1}$	$1.20\ 10^{1}$	$2.38\ 10^{1}$	$2.94\ 10^{1}$	$4.14\ 10^{1}$	$1.50\ 10^{2}$	0	$1.80\ 10^{2}$	$2.03\ 10^{2}$
Boron (not in boral)	$1.17\ 10^{0}$	$1.19\ 10^{1}$	$1.31\ 10^{1}$	$1.64\ 10^{1}$	$2.84\ 10^{1}$	$1.45\ 10^{2}$	0	$1.62\ 10^{2}$	$1.75\ 10^{2}$
Boron (in Boral)	$1.06\ 10^{1}$	$7.78\ 10^{-2}$	$1.07\ 10^{1}$	$1.30\ 10^{1}$	$1.31\ 10^{1}$	$4.69\ 10^{0}$	0	$1.77\ 10^{1}$	$2.84\ 10^{1}$
Boral	$1.06\ 10^{2}$	$7.78\ 10^{-1}$	$1.07\ 10^{2}$	-	$7.78\ 10^{-1}$	-	-	0	$1.07\ 10^{2}$
Cadmium	$3.63\ 10^{0}$	$1.45\ 10^{-4}$	$3.63\ 10^{0}$	$1.62\ 10^{0}$	$1.62\ 10^{0}$	$2.16\ 10^{-1}$	0	$1.83\ 10^{0}$	$5.46\ 10^{0}$
Caesium	0	0	0	0	0	0	0	0	0
Selenium	0	$2.89\ 10^{-3}$	$2.89\ 10^{-3}$	$1.15\ 10^{-3}$	$4.03\ 10^{-3}$	$1.11\ 10^{-2}$	0	$1.22\ 10^{-2}$	$1.51\ 10^{-2}$
Chromium	$3.42\ 10^{0}$	$4.15\ 10^{1}$	$4.50\ 10^{1}$	$3.55\ 10^{1}$	$7.71\ 10^{1}$	$1.39\ 10^{0}$	0	$3.69\ 10^{1}$	$8.19\ 10^{1}$
Molybdenum	$9.86\ 10^{2}$	$1.82\ 10^{1}$	$1.00\ 10^{3}$	$5.14\ 10^{0}$	$2.34\ 10^{1}$	$9.03\ 10^{-1}$	0	$6.05\ 10^{0}$	$1.01\ 10^{3}$
Thallium	0	0	0	0	0	0	0	0	0

Materials	Mass (t)								
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward Vaults	Total vaults
Tin	$2.08\ 10^{-2}$	$6.81\ 10^{-2}$	$8.88\ 10^{-2}$	$6.66\ 10^{0}$	$6.73\ 10^{0}$	$2.62\ 10^{0}$	$4.27\ 10^{-3}$	$9.29\ 10^{0}$	$9.37\ 10^{0}$
Vanadium	$1.15\ 10^{0}$	$9.05\ 10^{0}$	$1.02\ 10^{1}$	$3.18\ 10^{-1}$	$9.36\ 10^{0}$	$6.49\ 10^{-3}$	0	$3.25\ 10^{-1}$	$1.05\ 10^{1}$
Mercury	0	$1.43\ 10^{-3}$	$1.43\ 10^{-3}$	-	$1.43\ 10^{-3}$	-	-	0	$1.43\ 10^{-3}$
Mercury compounds	0	0	0	$5.62\ 10^{-1}$	$5.62\ 10^{-1}$	$2.94\ 10^{-2}$	$1.29\ 10^{-4}$	$5.91\ 10^{-1}$	$5.91\ 10^{-1}$
Thorium nitrate	0	$1.00\ 10^{-2}$	$1.00\ 10^{-2}$	-	$1.00\ 10^{-2}$	-	-	0	$1.00\ 10^{-2}$
Others hazard	0	0	0	$7.78\ 10^{0}$	$7.78\ 10^{0}$	$3.13\ 10^{-2}$	0	$7.81\ 10^{0}$	$7.81\ 10^{0}$
Electronic & electrical equipment (EEE)	$1.89\ 10^{1}$	$7.48\ 10^{1}$	$9.37\ 10^{1}$	$6.54\ 10^{1}$	$1.40\ 10^{2}$	$6.48\ 10^{-1}$	0	$6.61\ 10^{1}$	$1.60\ 10^{2}$
EEE_Type1	$3.26\ 10^{0}$	$1.25\ 10^{1}$	$1.57\ 10^{1}$	$1.83\ 10^{1}$	$3.07\ 10^{1}$	$3.94\ 10^{-1}$	0	$1.87\ 10^{1}$	$3.44\ 10^{1}$
EEE_Type2	$1.06\ 10^{1}$	$5.14\ 10^{1}$	$6.20\ 10^{1}$	$2.08\ 10^{1}$	$7.22\ 10^{1}$	$2.45\ 10^{-2}$	0	$2.08\ 10^{1}$	$8.28\ 10^{1}$
EEE_Type3	$4.99\ 10^{0}$	$1.10\ 10^{1}$	$1.60\ 10^{1}$	$1.93\ 10^{1}$	$3.02\ 10^{1}$	$2.30\ 10^{-1}$	0	$1.95\ 10^{1}$	$3.55\ 10^{1}$
EEE_Type4	0	$1.40\ 10^{-2}$	$1.40\ 10^{-2}$	$3.47\ 10^{0}$	$3.48\ 10^{0}$	0	0	$3.47\ 10^{0}$	$3.48\ 10^{0}$

Materials	Mass (t)								
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward Vaults	Total vaults
EEE_Type5	0	$2.50\ 10^{-3}$	$2.50\ 10^{-3}$	$3.62\ 10^{0}$	$3.62\ 10^{0}$	0	0	$3.62\ 10^{0}$	$3.62\ 10^{0}$
Non-UKRWI materials (i.e. materials that have been reported in disposed data for which there is not a clear corresponding reporting line in UKRWI)									
Ion exchange materials	$8.35\ 10^{2}$	$7.27\ 10^{1}$	$9.08\ 10^{2}$	-	$7.27\ 10^{1}$	-	-	0	$9.08\ 10^{2}$
Others	$8.32\ 10^{1}$	$1.60\ 10^{1}$	$9.92\ 10^{1}$	-	$1.60\ 10^{1}$	-	-	0	$9.92\ 10^{1}$
Other inorganics	$1.25\ 10^{3}$	$4.13\ 10^{1}$	$1.29\ 10^{3}$	-	$4.13\ 10^{1}$	-	-	0	$1.29\ 10^{3}$
Unknown materials	$3.69\ 10^{3}$	$5.99\ 10^{2}$	$4.29\ 10^{3}$	-	$5.99\ 10^{2}$	-	-	0	$4.29\ 10^{3}$
Barium carbonate	$1.00\ 10^{-5}$	$2.64\ 10^{-1}$	$2.64\ 10^{-1}$	-	$2.64\ 10^{-1}$	-	-	0	$2.64\ 10^{-1}$
Fibreglass	$5.41\ 10^{-1}$	$5.90\ 10^{0}$	$6.44\ 10^{0}$	-	$5.90\ 10^{0}$	-	-	0	$6.44\ 10^{0}$
Man made mineral fibres	$1.28\ 10^{1}$	$2.89\ 10^{1}$	$4.16\ 10^{1}$	-	$2.89\ 10^{1}$	-	-	0	$4.16\ 10^{1}$
Plasterboard	$1.20\ 10^{0}$	$8.24\ 10^{0}$	$9.44\ 10^{0}$	-	$8.24\ 10^{0}$	-	-	0	$9.44\ 10^{0}$
Rockwool	$3.07\ 10^{-1}$	$1.75\ 10^{1}$	$1.78\ 10^{1}$	-	$1.75\ 10^{1}$	-	-	0	$1.78\ 10^{1}$

Materials	Mass (t)								
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward Vaults	Total vaults
Sludge	0	$2.13\ 10^{-3}$	$2.13\ 10^{-3}$	-	$2.13\ 10^{-3}$	-	-	0	$2.13\ 10^{-3}$
Aluminium oxide	$4.64\ 10^{-3}$	0	$4.64\ 10^{-3}$	-	0	-	-	0	$4.64\ 10^{-3}$
Chromates (in System 6 epoxy paint)	0	$8.00\ 10^{-3}$	$8.00\ 10^{-3}$	-	$8.00\ 10^{-3}$	-	-	0	$8.00\ 10^{-3}$
Cybutryne	$1.00\ 10^{-6}$	0	$1.00\ 10^{-6}$	-	0	-	-	0	$1.00\ 10^{-6}$
Detex	$1.40\ 10^{-2}$	0	$1.40\ 10^{-2}$	-	0	-	-	0	$1.40\ 10^{-2}$
Magnesia (magnesium oxide)	0	$5.97\ 10^{-1}$	$5.97\ 10^{-1}$	-	$5.97\ 10^{-1}$	-	-	0	$5.97\ 10^{-1}$
Silicon sealant	$4.27\ 10^{-2}$	0	$4.27\ 10^{-2}$	-	0	-	-	0	$4.27\ 10^{-2}$
Additional/conditioning Materials									
Estimated box puck metal (data to 31st March 2018 only)	$4.18\ 10^{3}$	$2.34\ 10^{3}$	$6.52\ 10^{3}$	-	$2.34\ 10^{3}$	-	-	0	$6.52\ 10^{3}$

Materials	Mass (t)								
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward Vaults	Total vaults
Estimated drum puck metal (data to 31st March 2018 only)	$2.65\ 10^{3}$	$3.51\ 10^{2}$	$3.00\ 10^{3}$	-	$3.51\ 10^{2}$	-	-	0	$3.00\ 10^{3}$
Absorbant block	$1.17\ 10^{2}$	$2.41\ 10^{1}$	$1.42\ 10^{2}$	-	$2.41\ 10^{1}$	-	-	0	$1.42\ 10^{2}$
Conditioning glass	0	0	0	0	0	0	0	0	0
Conditioning grout	$1.66\ 10^{5}$	$3.38\ 10^{4}$	$2.00\ 10^{5}$	$1.49\ 10^{5}$	$1.83\ 10^{5}$	$1.50\ 10^{5}$	$5.37\ 10^{4}$	$3.52\ 10^{5}$	$5.52\ 10^{5}$
Container void fill sand	-	-	0	0	0	0	0	0	0
Conditioning polymer	-	-	0	0	0	0	0	0	0
Conditioning metal	0	0	0	0	0	0	0	0	0
Container/package materials									
Paint	$8.50\ 10^{-2}$	0	$8.50\ 10^{-2}$	0	0	0	0	0	$8.50\ 10^{-2}$
Noxyde paint	$3.74\ 10^{-1}$	0	$3.74\ 10^{-1}$	0	0	0	0	0	$3.74\ 10^{-1}$

Materials	Mass (t)								
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward Vaults	Total vaults
Metal plates TRS	2.95 10^{1}	0	2.95 10^{1}	0	0	0	0	0	2.95 10^{1}
Container metal	3.17 10^{4}	6.08 10^{3}	3.77 10^{4}	0	6.08 10^{3}	-	-	0	3.77 10^{4}
Container mild steel	0	0	0	2.52 10^{4}	2.52 10^{4}	2.49 10^{4}	8.99 10^{3}	5.91 10^{4}	5.91 10^{4}
Container stainless steel	0	0	0	0	0	0	0	0	0
Container concrete	0	0	0	0	0	0	0	0	0
Container cast iron	0	0	0	0	0	0	0	0	0
Container cast iron and lead	0	0	0	0	0	0	0	0	0
Container stainless steel and concrete	0	0	0	0	0	0	0	0	0
Container metal and concrete	0	0	0	0	0	0	0	0	0

Materials	Mass (t)								
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward Vaults	Total vaults
Other container materials	0	0	0	0	0	0	0	0	0

A4 C-14 in Materials

Table A.7: The activity of C-14 associated with materials in the Stage 3 LLW Forward Inventory. Tiered material groups are given in bold, which consist of the sum of the materials given in italic beneath them. Materials with no associated C-14 activity reported are not included

Waste materials	C-14 activity (TBq)			
	Vault 9 and 9a	Vault 10	Vault 11	Total Forward Vaults
Metals				
Ferrous stainless steel	$4.20\ 10^{-2}$	$1.64\ 10^{-1}$	$1.53\ 10^{-2}$	$2.21\ 10^{-1}$
Ferrous excluding stainless steel	$9.23\ 10^{-1}$	$1.12\ 10^{1}$	$2.86\ 10^{-1}$	$1.24\ 10^{1}$
Iron	$1.00\ 10^{-3}$	0	0	$1.00\ 10^{-3}$
Aluminium	0	0	0	0
Copper	0	0	0	0
Nickel	0	0	0	0
Uranium	0	0	0	0

Waste materials	C-14 activity (TBq)			
	Vault 9 and 9a	**Vault 10**	**Vault 11**	**Total Forward Vaults**
Other materials (group defined in UKRWI)				
Inorganic sludge & flocs	$8.42\ 10^{-2}$	$4.78\ 10^{-2}$	0	$1.32\ 10^{-1}$
Graphite	$2.57\ 10^{-1}$	$1.82\ 10^{0}$	$6.70\ 10^{-1}$	$2.75\ 10^{0}$
Cement/concrete	$1.11\ 10^{-1}$	$4.42\ 10^{-4}$	$3.16\ 10^{-4}$	$1.11\ 10^{-1}$
Glass/ceramics	0	0	0	0
Organics				
Cellulosics	$1.35\ 10^{-5}$	$4.05\ 10^{-6}$	0	$1.76\ 10^{-5}$
Paper	$6.09\ 10^{-6}$	$1.82\ 10^{-6}$	0	$7.92\ 10^{-6}$
Wood	$7.45\ 10^{-6}$	$2.23\ 10^{-6}$	0	$9.68\ 10^{-6}$
Ion exchange resins	$3.22\ 10^{-1}$	0	0	$3.22\ 10^{-1}$
Total rubber	0	0	0	0
Halogenated rubber	0	0	0	0

Waste materials	C-14 activity (TBq)			
	Vault 9 and 9a	**Vault 10**	**Vault 11**	**Total Forward Vaults**
Non-halogenated rubber	0	0	0	0
Other organics	$2.55\ 10^{-9}$	$6.29\ 10^{-9}$	0	$8.83\ 10^{-9}$
Not declared				
Not declared	$1.33\ 10^{0}$	$7.06\ 10^{-1}$	$4.06\ 10^{-1}$	$2.44\ 10^{0}$

A5 Container numbers

Table A.8: Container numbers in the vaults for the Stage 3 LLW-only Reference Inventory

Container Types	Number of containers								
	Vault 8	Disposed Vault 9 and 9a	Total disposed	Future Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward	Total
Windscale Advanced Gas Reactor (WAGR) Box	74	11	85	0	11	0	0	0	85
Treated Radwaste Store (TRS) Drums	1068	0	1068	0	0	0	0	0	1068
1/3 Height IP-2 ISO (TC03)	393	144	537	12	156	38	0	50	587
2/3 Height IP-2 ISO (TC06)	16	1	17	0	1	0	0	0	17
1/2 Height Waste Monitoring and Compaction (WAMAC) IP-2 ISO (TC08)	343	132	475	378	510	471	6	856	1331
1/2 Height Waste Monitoring and Compaction (WAMAC) IP-2 ISO (Package type other than TC08)	1941	703	2644	0	703	0	0	0	2644

Container Types	Number of containers								
	Vault 8	Disposed Vault 9 and 9a	Total disposed	Future Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward	Total
1/2 Height IP-2 Disposal/Re-usable ISO (TC01/TC02)	5217	999	6216	7753	8752	7608	2904	18265	24481
1/2 Height ISO (Package type other than TC01/TC02)	1343	7	1350	0	7	0	0	0	1350
3/4 Height ISO Container	4	4	8	0	4	0	0	0	8
Full Height ISO Container	217	0	217	0	0	0	0	0	217
Other Container or Non-Standard Item	596	5	601	0	5	0	0	0	601
Total packages	11212	2006	13218	8142	10148	8118	2910	19170	32388

A6 Non-radiological contaminants

Table A.9: A summary of the masses of selected non-radiological contaminants in the vaults for the Stage 3 LLW-only Reference Inventory. Tiered material groups are given in bold, which consist of the sum of the materials given in italic beneath them[4]

Materials	Mass (t)								
	Vault 8	Disposed Vault 9 and 9a	Total disposed	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward	Total
Arsenic	$9.75\ 10^{-9}$	$2.02\ 10^{-3}$	$2.02\ 10^{-3}$	$3.68\ 10^{-3}$	$5.70\ 10^{-3}$	$3.59\ 10^{-2}$	0	$3.96\ 10^{-2}$	$4.16\ 10^{-2}$
Asphalt tarmac (cont. coal tar)	$5.56\ 10^{1}$	$2.92\ 10^{2}$	$3.47\ 10^{2}$	$7.73\ 10^{1}$	$3.69\ 10^{2}$	$4.14\ 10^{1}$	$8.48\ 10^{-1}$	$1.19\ 10^{2}$	$4.67\ 10^{2}$
Beryllium	$3.98\ 10^{-1}$	$6.80\ 10^{-2}$	$4.66\ 10^{-1}$	$8.92\ 10^{-1}$	$9.60\ 10^{-1}$	$9.96\ 10^{-3}$	0	$9.02\ 10^{-1}$	$1.37\ 10^{0}$
Boron	$1.18\ 10^{1}$	$1.20\ 10^{1}$	$2.38\ 10^{1}$	$2.94\ 10^{1}$	$4.14\ 10^{1}$	$1.50\ 10^{2}$	0	$1.80\ 10^{2}$	$2.03\ 10^{2}$
Boron non-Boral	$1.17\ 10^{0}$	$1.19\ 10^{1}$	$1.31\ 10^{1}$	$1.64\ 10^{1}$	$2.84\ 10^{1}$	$1.45\ 10^{2}$	0	$1.62\ 10^{2}$	$1.75\ 10^{2}$

[4] Data presented here are for the Stage 3 inventory. We have not attempted to further derive estimates of non-radiological inventory beyond what has been reported. The HRA uses material data provided in the Stage 2 Reference Inventory and applies assumptions on the composition of contaminants in each material.

Materials	Mass (t)								
	Vault 8	Disposed Vault 9 and 9a	Total disposed	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Total Forward	Total
Boron Boral	$1.06\ 10^{1}$	$7.78\ 10^{-2}$	$1.07\ 10^{1}$	$1.30\ 10^{1}$	$1.31\ 10^{1}$	$4.69\ 10^{0}$	0	$1.77\ 10^{1}$	$2.84\ 10^{1}$
Cadmium	$3.63\ 10^{0}$	$1.45\ 10^{-4}$	$3.63\ 10^{0}$	$1.62\ 10^{0}$	$1.62\ 10^{0}$	$2.16\ 10^{-1}$	0	$1.83\ 10^{0}$	$5.46\ 10^{0}$
Lead	$4.08\ 10^{3}$	$2.68\ 10^{2}$	$4.35\ 10^{3}$	$1.17\ 10^{3}$	$1.44\ 10^{3}$	$5.04\ 10^{3}$	$1.09\ 10^{1}$	$6.22\ 10^{3}$	$1.06\ 10^{4}$
Selenium	0	$2.89\ 10^{-3}$	$2.89\ 10^{-3}$	$1.15\ 10^{-3}$	$4.03\ 10^{-3}$	$1.11\ 10^{-2}$	0	$1.22\ 10^{-2}$	$1.51\ 10^{-2}$
Tri-butyl phosphate	0	$2.88\ 10^{-2}$	$2.88\ 10^{-2}$	$2.38\ 10^{-1}$	$2.67\ 10^{-1}$	$3.05\ 10^{-2}$	$4.85\ 10^{-4}$	$2.69\ 10^{-1}$	$2.98\ 10^{-1}$

A7 Fill Dates

Table A.10: Expected vault fill dates for the Stage 3 LLW-only Forward Inventory based on the UKRWI arisings profiles

Vault	Year for first waste emplacement (FY beginning)	Year of final waste emplacement (FY beginning)	Percent filled
9	2008	2043	100%
10	2043	2111	100%
11	2111	2135	51%

Appendix B: Reference Inventory Data (Stage 3) - LLW and ILW

This appendix presents the combined Stage 3 LLW and ILW inventory data if a decision is taken to accept ILW. The trench and disposed vault data remain unchanged from those presented in appendices A1 to A7. The total volume and activity of LLW are unchanged from those presented in appendices A1 to A7 but the distribution of LLW between the vaults is different due to the addition of ILW.

B1 Radionuclides

Table B.1: Summary of radionuclide activities in the Stage 3 Reference Inventory

Radionuclide or Radionuclide Group	Activity (TBq)										
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total forward vaults	Total vaults
Ac-227	$3.03\ 10^{-19}$	$1.89\ 10^{-2}$	$1.06\ 10^{-4}$	$1.90\ 10^{-2}$	$7.71\ 10^{-5}$	$1.83\ 10^{-4}$	$5.59\ 10^{-6}$	0	0	$8.26\ 10^{-5}$	$1.91\ 10^{-2}$
Ag-108	-	$8.61\ 10^{-7}$	$3.00\ 10^{-8}$	$8.91\ 10^{-7}$	-	$3.00\ 10^{-8}$	-	-	-	0	$8.91\ 10^{-7}$
Ag-108m	$2.45\ 10^{-5}$	$7.49\ 10^{-3}$	$5.66\ 10^{-3}$	$1.32\ 10^{-2}$	$5.33\ 10^{-2}$	$5.89\ 10^{-2}$	$6.22\ 10^{-2}$	$4.62\ 10^{-2}$	$7.88\ 10^{-3}$	$1.70\ 10^{-1}$	$1.83\ 10^{-1}$
Ag-110	-	$1.13\ 10^{-4}$	$2.46\ 10^{-8}$	$1.13\ 10^{-4}$	-	$2.46\ 10^{-8}$	-	-	-	0	$1.13\ 10^{-4}$
Ag-110m	$2.38\ 10^{-3}$	$6.48\ 10^{-2}$	$1.63\ 10^{-3}$	$6.65\ 10^{-2}$	$2.38\ 10^{-1}$	$2.39\ 10^{-1}$	$1.02\ 10^{0}$	$1.46\ 10^{-1}$	0	$1.40\ 10^{0}$	$1.47\ 10^{0}$
Al-26	-	$1.03\ 10^{-6}$	0	$1.03\ 10^{-6}$	$8.66\ 10^{-3}$	$8.66\ 10^{-3}$	$5.51\ 10^{-3}$	$1.45\ 10^{-4}$	0	$1.43\ 10^{-2}$	$1.43\ 10^{-2}$

Radionuclide or Radionuclide Group	Activity (TBq)										
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total forward vaults	Total vaults
Am-241	$6.19\ 10^{-1}$	$8.01\ 10^{-1}$	$5.29\ 10^{-1}$	$1.33\ 10^{0}$	$5.20\ 10^{0}$	$5.73\ 10^{0}$	$2.20\ 10^{0}$	$1.51\ 10^{0}$	$8.81\ 10^{-3}$	$8.92\ 10^{0}$	$1.02\ 10^{1}$
Am-242m	$6.14\ 10^{-3}$	$1.95\ 10^{-4}$	$3.14\ 10^{-4}$	$5.09\ 10^{-4}$	$1.88\ 10^{-3}$	$2.20\ 10^{-3}$	$1.27\ 10^{-3}$	$1.13\ 10^{-10}$	$1.04\ 10^{-10}$	$3.16\ 10^{-3}$	$3.67\ 10^{-3}$
Am-243	$6.44\ 10^{-5}$	$1.97\ 10^{-4}$	$1.70\ 10^{-4}$	$3.68\ 10^{-4}$	$8.98\ 10^{-4}$	$1.07\ 10^{-3}$	$1.19\ 10^{-2}$	$2.86\ 10^{-5}$	$2.89\ 10^{-6}$	$1.28\ 10^{-2}$	$1.32\ 10^{-2}$
Ar-39	-	$1.97\ 10^{-7}$	0	$1.97\ 10^{-7}$	$7.63\ 10^{-5}$	$7.63\ 10^{-5}$	$2.81\ 10^{-1}$	$7.55\ 10^{-5}$	0	$2.81\ 10^{-1}$	$2.81\ 10^{-1}$
Ar-42	-	0	0	0	0	0	$5.74\ 10^{-6}$	0	0	$5.74\ 10^{-6}$	$5.74\ 10^{-6}$
Ba-133	$5.42\ 10^{-3}$	$1.78\ 10^{-1}$	$8.92\ 10^{-4}$	$1.79\ 10^{-1}$	$2.68\ 10^{-2}$	$2.77\ 10^{-2}$	$2.66\ 10^{-1}$	$1.52\ 10^{-2}$	$7.16\ 10^{-3}$	$3.16\ 10^{-1}$	$4.95\ 10^{-1}$
Ba-137m	-	$8.46\ 10^{-2}$	$3.71\ 10^{-11}$	$8.46\ 10^{-2}$	-	$3.71\ 10^{-11}$	-	-	-	0	$8.46\ 10^{-2}$
Be-10	$5.29\ 10^{-16}$	$3.17\ 10^{-13}$	0	$3.17\ 10^{-13}$	$8.09\ 10^{-5}$	$8.09\ 10^{-5}$	$2.49\ 10^{-3}$	$1.10\ 10^{-7}$	$4.40\ 10^{-8}$	$2.57\ 10^{-3}$	$2.57\ 10^{-3}$
Bi-207	-	$1.55\ 10^{-7}$	$6.14\ 10^{-6}$	$6.29\ 10^{-6}$	-	$6.14\ 10^{-6}$	-	-	-	0	$6.29\ 10^{-6}$
Bi-208	-	0	0	0	0	0	$1.15\ 10^{-8}$	0	0	$1.15\ 10^{-8}$	$1.15\ 10^{-8}$
Bi-210m	-	0	0	0	$7.86\ 10^{-6}$	$7.86\ 10^{-6}$	$5.11\ 10^{-8}$	0	0	$7.91\ 10^{-6}$	$7.91\ 10^{-6}$
Bi-214	-	$3.16\ 10^{-7}$	$2.32\ 10^{-7}$	$5.48\ 10^{-7}$	-	$2.32\ 10^{-7}$	-	-	-	0	$5.48\ 10^{-7}$

Radionuclide or Radionuclide Group	Activity (TBq)										
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total forward vaults	Total vaults
C-14	$9.98\ 10^{-2}$	$5.16\ 10^{-1}$	$1.23\ 10^{-1}$	$6.39\ 10^{-1}$	$2.04\ 10^{1}$	$2.05\ 10^{1}$	$7.58\ 10^{1}$	$2.21\ 10^{1}$	$1.54\ 10^{1}$	$1.34\ 10^{2}$	$1.34\ 10^{2}$
Ca-41	$5.58\ 10^{-3}$	$1.23\ 10^{-2}$	$3.60\ 10^{-4}$	$1.26\ 10^{-2}$	$6.72\ 10^{-1}$	$6.72\ 10^{-1}$	$7.39\ 10^{-1}$	$2.55\ 10^{0}$	$5.73\ 10^{-1}$	$4.53\ 10^{0}$	$4.54\ 10^{0}$
Ca-45	$2.07\ 10^{-3}$	$3.90\ 10^{-2}$	$9.16\ 10^{-4}$	$4.00\ 10^{-2}$	-	$9.16\ 10^{-4}$	-	-	-	0	$4.00\ 10^{-2}$
Cd-109	$3.47\ 10^{-3}$	$7.20\ 10^{-2}$	$2.86\ 10^{-4}$	$7.23\ 10^{-2}$	$5.08\ 10^{-3}$	$5.37\ 10^{-3}$	$1.55\ 10^{-3}$	0	0	$6.63\ 10^{-3}$	$7.89\ 10^{-2}$
Cd-113	-	0	$2.66\ 10^{-5}$	$2.66\ 10^{-5}$	-	$2.66\ 10^{-5}$	-	-	-	0	$2.66\ 10^{-5}$
Cd-113m	$2.89\ 10^{-9}$	$4.98\ 10^{-5}$	$2.23\ 10^{-4}$	$2.73\ 10^{-4}$	$5.16\ 10^{-1}$	$5.17\ 10^{-1}$	$3.24\ 10^{-1}$	$8.50\ 10^{-10}$	$5.14\ 10^{-9}$	$8.41\ 10^{-1}$	$8.41\ 10^{-1}$
Ce-139	-	$2.23\ 10^{-11}$	$4.93\ 10^{-10}$	$5.16\ 10^{-10}$	-	$4.93\ 10^{-10}$	-	-	-	0	$5.16\ 10^{-10}$
Ce-141	$1.09\ 10^{-3}$	$2.09\ 10^{-4}$	$7.20\ 10^{-8}$	$2.09\ 10^{-4}$	-	$7.20\ 10^{-8}$	-	-	-	0	$2.09\ 10^{-4}$
Ce-144	$1.05\ 10^{0}$	$9.16\ 10^{-1}$	$3.09\ 10^{-2}$	$9.46\ 10^{-1}$	$1.32\ 10^{-1}$	$1.63\ 10^{-1}$	$6.41\ 10^{-1}$	$1.14\ 10^{0}$	$5.73\ 10^{-4}$	$1.92\ 10^{0}$	$2.86\ 10^{0}$
Cf-249	$7.50\ 10^{-9}$	$1.15\ 10^{-7}$	$7.66\ 10^{-7}$	$8.82\ 10^{-7}$	$3.61\ 10^{-5}$	$3.68\ 10^{-5}$	$7.16\ 10^{-5}$	0	0	$1.08\ 10^{-4}$	$1.09\ 10^{-4}$
Cf-250	$7.35\ 10^{-8}$	$3.60\ 10^{-6}$	$1.62\ 10^{-8}$	$3.62\ 10^{-6}$	$1.54\ 10^{-4}$	$1.54\ 10^{-4}$	$2.40\ 10^{-4}$	0	0	$3.94\ 10^{-4}$	$3.98\ 10^{-4}$
Cf-251	$1.51\ 10^{-6}$	$1.13\ 10^{-5}$	$1.79\ 10^{-6}$	$1.31\ 10^{-5}$	0	$1.79\ 10^{-6}$	0	0	0	0	$1.31\ 10^{-5}$

Radionuclide or Radionuclide Group	Activity (TBq)										
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total forward vaults	Total vaults
Cf-252	$2.53\ 10^{-5}$	$1.98\ 10^{-4}$	$3.05\ 10^{-6}$	$2.01\ 10^{-4}$	$3.10\ 10^{-7}$	$3.36\ 10^{-6}$	$5.90\ 10^{-7}$	0	0	$9.00\ 10^{-7}$	$2.02\ 10^{-4}$
Cl-36	$1.85\ 10^{-2}$	$5.08\ 10^{-1}$	$9.67\ 10^{-2}$	$6.04\ 10^{-1}$	$1.16\ 10^{0}$	$1.26\ 10^{0}$	$7.31\ 10^{-1}$	$2.68\ 10^{-1}$	$1.65\ 10^{-1}$	$2.33\ 10^{0}$	$2.93\ 10^{0}$
Cm-241	-	$1.50\ 10^{-5}$	$1.04\ 10^{-14}$	$1.50\ 10^{-5}$	-	$1.04\ 10^{-14}$	-	-	-	0	$1.50\ 10^{-5}$
Cm-242	$5.10\ 10^{-3}$	$9.00\ 10^{-3}$	$1.02\ 10^{-3}$	$1.00\ 10^{-2}$	$3.07\ 10^{-3}$	$4.09\ 10^{-3}$	$1.28\ 10^{-3}$	$3.00\ 10^{-4}$	$1.59\ 10^{-6}$	$4.65\ 10^{-3}$	$1.47\ 10^{-2}$
Cm-243	$8.00\ 10^{-4}$	$5.02\ 10^{-4}$	$7.04\ 10^{-4}$	$1.21\ 10^{-3}$	$3.79\ 10^{-3}$	$4.49\ 10^{-3}$	$2.33\ 10^{-3}$	$3.18\ 10^{-3}$	$1.63\ 10^{-6}$	$9.30\ 10^{-3}$	$1.05\ 10^{-2}$
Cm-244	$4.65\ 10^{-3}$	$1.43\ 10^{-2}$	$5.64\ 10^{-3}$	$1.99\ 10^{-2}$	$1.65\ 10^{0}$	$1.65\ 10^{0}$	$1.49\ 10^{0}$	$1.93\ 10^{-1}$	$1.31\ 10^{-4}$	$3.32\ 10^{0}$	$3.34\ 10^{0}$
Cm-245	$1.39\ 10^{-6}$	$3.04\ 10^{-6}$	$2.53\ 10^{-6}$	$5.57\ 10^{-6}$	$2.06\ 10^{-3}$	$2.06\ 10^{-3}$	$6.85\ 10^{-4}$	0	0	$2.74\ 10^{-3}$	$2.75\ 10^{-3}$
Cm-246	$8.34\ 10^{-7}$	$1.58\ 10^{-6}$	$2.02\ 10^{-8}$	$1.60\ 10^{-6}$	$3.79\ 10^{-5}$	$3.79\ 10^{-5}$	$4.88\ 10^{-3}$	0	0	$4.92\ 10^{-3}$	$4.92\ 10^{-3}$
Cm-247	-	$1.15\ 10^{-7}$	$1.24\ 10^{-6}$	$1.35\ 10^{-6}$	-	$1.24\ 10^{-6}$	-	-	-	0	$1.35\ 10^{-6}$
Cm-248	$2.66\ 10^{-6}$	$2.45\ 10^{-5}$	0	$2.45\ 10^{-5}$	$3.22\ 10^{-5}$	$3.22\ 10^{-5}$	$5.17\ 10^{-18}$	0	0	$3.22\ 10^{-5}$	$5.67\ 10^{-5}$
Co-57	$2.34\ 10^{-2}$	$2.36\ 10^{-1}$	$5.18\ 10^{-4}$	$2.36\ 10^{-1}$	-	$5.18\ 10^{-4}$	-	-	-	0	$2.36\ 10^{-1}$
Co-58	$3.87\ 10^{-2}$	$5.82\ 10^{-3}$	$3.45\ 10^{-3}$	$9.27\ 10^{-3}$	-	$3.45\ 10^{-3}$	-	-	-	0	$9.27\ 10^{-3}$

Radionuclide or Radionuclide Group	Activity (TBq)										
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total forward vaults	Total vaults
Co-60	$1.65\ 10^{0}$	$5.89\ 10^{0}$	$7.84\ 10^{-1}$	$6.68\ 10^{0}$	$2.47\ 10^{1}$	$2.54\ 10^{1}$	$1.35\ 10^{2}$	$2.36\ 10^{2}$	$1.11\ 10^{2}$	$5.06\ 10^{2}$	$5.13\ 10^{2}$
Cr-51	$7.08\ 10^{-3}$	$2.14\ 10^{-3}$	$3.15\ 10^{-3}$	$5.28\ 10^{-3}$	-	$3.15\ 10^{-3}$	-	-	-	0	$5.28\ 10^{-3}$
Cs-134	$3.52\ 10^{-1}$	$6.19\ 10^{-1}$	$1.04\ 10^{-1}$	$7.23\ 10^{-1}$	$4.26\ 10^{-1}$	$5.30\ 10^{-1}$	$1.52\ 10^{0}$	$2.92\ 10^{0}$	$1.50\ 10^{-3}$	$4.87\ 10^{0}$	$5.59\ 10^{0}$
Cs-135	$1.27\ 10^{-13}$	$3.96\ 10^{-4}$	$1.33\ 10^{-4}$	$5.30\ 10^{-4}$	$2.43\ 10^{-4}$	$3.77\ 10^{-4}$	$2.18\ 10^{-3}$	$7.54\ 10^{-8}$	$1.57\ 10^{-11}$	$2.42\ 10^{-3}$	$2.95\ 10^{-3}$
Cs-137	$1.60\ 10^{1}$	$2.99\ 10^{1}$	$4.34\ 10^{0}$	$3.43\ 10^{1}$	$3.06\ 10^{1}$	$3.50\ 10^{1}$	$2.03\ 10^{2}$	$4.79\ 10^{2}$	$2.50\ 10^{-1}$	$7.13\ 10^{2}$	$7.47\ 10^{2}$
Es-254	$2.50\ 10^{-9}$	$8.12\ 10^{-8}$	$1.62\ 10^{-8}$	$9.74\ 10^{-8}$	-	$1.62\ 10^{-8}$	-	-	-	0	$9.74\ 10^{-8}$
Eu-152	$1.81\ 10^{-1}$	$5.44\ 10^{-1}$	$4.40\ 10^{-3}$	$5.49\ 10^{-1}$	$1.01\ 10^{1}$	$1.01\ 10^{1}$	$6.17\ 10^{0}$	$8.08\ 10^{-1}$	$1.07\ 10^{-1}$	$1.72\ 10^{1}$	$1.78\ 10^{1}$
Eu-154	$5.76\ 10^{-2}$	$1.57\ 10^{-1}$	$2.10\ 10^{-2}$	$1.78\ 10^{-1}$	$4.69\ 10^{0}$	$4.71\ 10^{0}$	$3.42\ 10^{0}$	$5.42\ 10^{-2}$	$1.83\ 10^{-2}$	$8.18\ 10^{0}$	$8.36\ 10^{0}$
Eu-155	$1.41\ 10^{-2}$	$3.52\ 10^{-2}$	$9.37\ 10^{-3}$	$4.46\ 10^{-2}$	$9.09\ 10^{-2}$	$1.00\ 10^{-1}$	$7.84\ 10^{-2}$	$9.02\ 10^{-2}$	$8.97\ 10^{-5}$	$2.60\ 10^{-1}$	$3.04\ 10^{-1}$
Fe-55	$5.68\ 10^{-1}$	$8.38\ 10^{0}$	$1.14\ 10^{0}$	$9.51\ 10^{0}$	$1.93\ 10^{2}$	$1.94\ 10^{2}$	$7.42\ 10^{2}$	$1.40\ 10^{2}$	$6.58\ 10^{1}$	$1.14\ 10^{3}$	$1.15\ 10^{3}$
Fe-59	$6.55\ 10^{-3}$	$1.99\ 10^{-2}$	$5.08\ 10^{-4}$	$2.05\ 10^{-2}$	-	$5.08\ 10^{-4}$	-	-	-	0	$2.05\ 10^{-2}$
Gd-153	$3.00\ 10^{-4}$	$8.01\ 10^{-3}$	$9.82\ 10^{-8}$	$8.01\ 10^{-3}$	$3.70\ 10^{-4}$	$3.70\ 10^{-4}$	$2.47\ 10^{-4}$	$2.48\ 10^{-7}$	$8.91\ 10^{-8}$	$6.17\ 10^{-4}$	$8.62\ 10^{-3}$

Radionuclide or Radionuclide Group	Activity (TBq)										
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total forward vaults	Total vaults
Ge-68	-	0	$5.00\ 10^{-6}$	$5.00\ 10^{-6}$	-	$5.00\ 10^{-6}$	-	-	-	0	$5.00\ 10^{-6}$
H-3	$5.02\ 10^{2}$	$2.16\ 10^{1}$	$6.59\ 10^{0}$	$2.82\ 10^{1}$	$6.35\ 10^{3}$	$6.36\ 10^{3}$	$4.20\ 10^{3}$	$5.57\ 10^{0}$	$1.34\ 10^{0}$	$1.06\ 10^{4}$	$1.06\ 10^{4}$
Hf-178n	-	0	0	0	$4.32\ 10^{-5}$	$4.32\ 10^{-5}$	$5.33\ 10^{-2}$	0	0	$5.33\ 10^{-2}$	$5.33\ 10^{-2}$
Hf-182	-	0	0	0	0	0	$4.11\ 10^{-9}$	0	0	$4.11\ 10^{-9}$	$4.11\ 10^{-9}$
Hg-203	$2.89\ 10^{-5}$	$9.63\ 10^{-7}$	$1.80\ 10^{-5}$	$1.89\ 10^{-5}$	-	$1.80\ 10^{-5}$	-	-	-	0	$1.89\ 10^{-5}$
Ho-163	-	0	0	0	$1.69\ 10^{-5}$	$1.69\ 10^{-5}$	$1.36\ 10^{-4}$	$4.98\ 10^{-5}$	0	$2.03\ 10^{-4}$	$2.03\ 10^{-4}$
Ho-166m	$2.29\ 10^{-7}$	$2.64\ 10^{-5}$	$3.08\ 10^{-5}$	$5.72\ 10^{-5}$	$1.53\ 10^{-2}$	$1.54\ 10^{-2}$	$4.88\ 10^{-2}$	$1.12\ 10^{-3}$	$9.82\ 10^{-4}$	$6.62\ 10^{-2}$	$6.63\ 10^{-2}$
I-125	$8.48\ 10^{-6}$	$2.37\ 10^{-5}$	$6.47\ 10^{-6}$	$3.02\ 10^{-5}$	-	$6.47\ 10^{-6}$	-	-	-	0	$3.02\ 10^{-5}$
I-129	$2.95\ 10^{-3}$	$2.85\ 10^{-3}$	$4.47\ 10^{-4}$	$3.29\ 10^{-3}$	$3.35\ 10^{-2}$	$3.39\ 10^{-2}$	$3.89\ 10^{-4}$	$3.24\ 10^{-4}$	$1.53\ 10^{-7}$	$3.42\ 10^{-2}$	$3.75\ 10^{-2}$
Ir-192	$1.75\ 10^{-4}$	$1.12\ 10^{-3}$	$6.41\ 10^{-9}$	$1.12\ 10^{-3}$	-	$6.41\ 10^{-9}$	-	-	-	0	$1.12\ 10^{-3}$
K-40	$2.54\ 10^{-4}$	$2.65\ 10^{-3}$	$2.29\ 10^{-5}$	$2.67\ 10^{-3}$	$9.87\ 10^{-4}$	$1.01\ 10^{-3}$	$4.39\ 10^{-4}$	0	0	$1.43\ 10^{-3}$	$4.10\ 10^{-3}$
Kr-81	-	0	0	0	$9.29\ 10^{-7}$	$9.29\ 10^{-7}$	$9.77\ 10^{-3}$	0	0	$9.78\ 10^{-3}$	$9.78\ 10^{-3}$

Radionuclide or Radionuclide Group	Activity (TBq)										
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total forward vaults	Total vaults
Kr-85	$7.42\ 10^{-3}$	$9.00\ 10^{-2}$	$4.76\ 10^{-3}$	$9.48\ 10^{-2}$	$2.49\ 10^{-3}$	$7.26\ 10^{-3}$	$2.74\ 10^{-1}$	0	0	$2.77\ 10^{-1}$	$3.71\ 10^{-1}$
La-137	-	$4.77\ 10^{-15}$	0	$4.77\ 10^{-15}$	$7.18\ 10^{-4}$	$7.18\ 10^{-4}$	$5.96\ 10^{-4}$	$8.93\ 10^{-6}$	$3.21\ 10^{-6}$	$1.33\ 10^{-3}$	$1.33\ 10^{-3}$
La-138	-	0	0	0	0	0	$3.37\ 10^{-9}$	0	0	$3.37\ 10^{-9}$	$3.37\ 10^{-9}$
Lu-174	-	0	0	0	$2.02\ 10^{-2}$	$2.02\ 10^{-2}$	$1.34\ 10^{-2}$	0	0	$3.36\ 10^{-2}$	$3.36\ 10^{-2}$
Lu-176	-	$2.48\ 10^{-9}$	0	$2.48\ 10^{-9}$	$4.70\ 10^{-6}$	$4.70\ 10^{-6}$	$1.17\ 10^{-9}$	0	0	$4.70\ 10^{-6}$	$4.70\ 10^{-6}$
Mn-53	-	0	0	0	$2.04\ 10^{-3}$	$2.04\ 10^{-3}$	$1.36\ 10^{-3}$	0	0	$3.39\ 10^{-3}$	$3.39\ 10^{-3}$
Mn-54	$4.54\ 10^{-2}$	$1.56\ 10^{-1}$	$4.38\ 10^{-2}$	$1.99\ 10^{-1}$	$1.57\ 10^{1}$	$1.58\ 10^{1}$	$6.30\ 10^{1}$	$2.44\ 10^{1}$	$1.15\ 10^{1}$	$1.15\ 10^{2}$	$1.15\ 10^{2}$
Mo-93	$9.02\ 10^{-8}$	$5.37\ 10^{-6}$	$1.18\ 10^{-5}$	$1.72\ 10^{-5}$	$9.35\ 10^{-2}$	$9.35\ 10^{-2}$	$4.70\ 10^{-1}$	$1.05\ 10^{0}$	$1.18\ 10^{-1}$	$1.73\ 10^{0}$	$1.73\ 10^{0}$
Na-22	$2.79\ 10^{-3}$	$6.94\ 10^{-2}$	$2.10\ 10^{-5}$	$6.94\ 10^{-2}$	$1.94\ 10^{-1}$	$1.94\ 10^{-1}$	$1.48\ 10^{-1}$	0	0	$3.42\ 10^{-1}$	$4.11\ 10^{-1}$
Nb-91	-	0	0	0	$6.39\ 10^{-5}$	$6.39\ 10^{-5}$	$1.87\ 10^{-6}$	0	0	$6.58\ 10^{-5}$	$6.58\ 10^{-5}$
Nb-92	-	0	0	0	$7.69\ 10^{-6}$	$7.69\ 10^{-6}$	$8.71\ 10^{-6}$	0	0	$1.64\ 10^{-5}$	$1.64\ 10^{-5}$
Nb-93m	$5.56\ 10^{-4}$	$4.37\ 10^{-5}$	$2.43\ 10^{-4}$	$2.87\ 10^{-4}$	$8.51\ 10^{-2}$	$8.53\ 10^{-2}$	$8.42\ 10^{-2}$	$1.87\ 10^{-2}$	$8.34\ 10^{-3}$	$1.96\ 10^{-1}$	$1.97\ 10^{-1}$

Radionuclide or Radionuclide Group	Activity (TBq)										
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total forward vaults	Total vaults
Nb-94	$7.92\ 10^{-5}$	$4.91\ 10^{-3}$	$2.10\ 10^{-3}$	$7.02\ 10^{-3}$	$2.31\ 10^{-2}$	$2.52\ 10^{-2}$	$2.44\ 10^{-1}$	$5.38\ 10^{-2}$	$2.66\ 10^{-2}$	$3.48\ 10^{-1}$	$3.55\ 10^{-1}$
Nb-95	$8.28\ 10^{-2}$	$1.69\ 10^{-1}$	$7.46\ 10^{-3}$	$1.77\ 10^{-1}$	-	$7.46\ 10^{-3}$	-	-	-	0	$1.77\ 10^{-1}$
Ni-59	$1.78\ 10^{-4}$	$4.69\ 10^{-3}$	$7.59\ 10^{-4}$	$5.45\ 10^{-3}$	$1.45\ 10^{0}$	$1.45\ 10^{0}$	$2.09\ 10^{1}$	$8.82\ 10^{0}$	$1.48\ 10^{1}$	$4.60\ 10^{1}$	$4.60\ 10^{1}$
Ni-63	$2.32\ 10^{-1}$	$2.99\ 10^{0}$	$7.90\ 10^{-1}$	$3.78\ 10^{0}$	$1.56\ 10^{2}$	$1.56\ 10^{2}$	$1.58\ 10^{3}$	$4.85\ 10^{2}$	$9.39\ 10^{2}$	$3.15\ 10^{3}$	$3.16\ 10^{3}$
Np-235	-	0	$5.00\ 10^{-8}$	$5.00\ 10^{-8}$	-	$5.00\ 10^{-8}$	-	-	-	0	$5.00\ 10^{-8}$
Np-237	$2.65\ 10^{-2}$	$3.99\ 10^{-2}$	$4.61\ 10^{-3}$	$4.45\ 10^{-2}$	$7.09\ 10^{-2}$	$7.55\ 10^{-2}$	$4.46\ 10^{-2}$	$9.60\ 10^{-2}$	$7.28\ 10^{-5}$	$2.12\ 10^{-1}$	$2.56\ 10^{-1}$
Np-239	-	$6.19\ 10^{-4}$	$8.01\ 10^{-12}$	$6.19\ 10^{-4}$	-	$8.01\ 10^{-12}$	-	-	-	0	$6.19\ 10^{-4}$
OA	$4.97\ 10^{-2}$	0	0	0	$1.87\ 10^{1}$	$1.87\ 10^{1}$	$1.34\ 10^{1}$	$6.37\ 10^{-2}$	$4.65\ 10^{-5}$	$3.21\ 10^{1}$	$3.21\ 10^{1}$
OBG	$2.26\ 10^{0}$	0	0	0	$7.72\ 10^{1}$	$7.72\ 10^{1}$	$3.43\ 10^{1}$	$7.03\ 10^{0}$	$6.98\ 10^{-1}$	$1.19\ 10^{2}$	$1.19\ 10^{2}$
OTHSA	-	$1.48\ 10^{-3}$	$1.40\ 10^{-5}$	$1.49\ 10^{-3}$	-	$1.40\ 10^{-5}$	-	-	-	0	$1.49\ 10^{-3}$
OTHSB	-	$6.77\ 10^{-1}$	$5.68\ 10^{-2}$	$7.34\ 10^{-1}$	-	$5.68\ 10^{-2}$	-	-	-	0	$7.34\ 10^{-1}$
P-33	$8.27\ 10^{-6}$	$3.33\ 10^{-5}$	$1.91\ 10^{-10}$	$3.33\ 10^{-5}$	-	$1.91\ 10^{-10}$	-	-	-	0	$3.33\ 10^{-5}$

Radionuclide or Radionuclide Group	Activity (TBq)										
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total forward vaults	Total vaults
Pa-231	$9.02\ 10^{-5}$	$5.01\ 10^{-4}$	$1.20\ 10^{-4}$	$6.21\ 10^{-4}$	$5.96\ 10^{-3}$	$6.08\ 10^{-3}$	$9.06\ 10^{-3}$	$1.50\ 10^{-11}$	$1.42\ 10^{-11}$	$1.50\ 10^{-2}$	$1.56\ 10^{-2}$
Pa-232	$5.35\ 10^{-7}$	$8.83\ 10^{-4}$	$1.61\ 10^{-6}$	$8.85\ 10^{-4}$	-	$1.61\ 10^{-6}$	-	-	-	0	$8.85\ 10^{-4}$
Pa-233	$5.67\ 10^{-6}$	$2.83\ 10^{-5}$	$1.83\ 10^{-5}$	$4.66\ 10^{-5}$	$6.13\ 10^{-2}$	$6.13\ 10^{-2}$	$1.17\ 10^{-3}$	0	0	$6.25\ 10^{-2}$	$6.25\ 10^{-2}$
Pa-234	-	0	$2.06\ 10^{-4}$	$2.06\ 10^{-4}$	-	$2.06\ 10^{-4}$	-	-	-	0	$2.06\ 10^{-4}$
Pa-234m	-	$2.00\ 10^{-8}$	$8.79\ 10^{-18}$	$2.00\ 10^{-8}$	-	$8.79\ 10^{-18}$	-	-	-	0	$2.00\ 10^{-8}$
Pb-205	-	0	0	0	0	0	$1.84\ 10^{-7}$	0	0	$1.84\ 10^{-7}$	$1.84\ 10^{-7}$
Pb-210	$2.22\ 10^{-3}$	$4.72\ 10^{-2}$	$8.08\ 10^{-3}$	$5.52\ 10^{-2}$	$1.54\ 10^{-3}$	$9.62\ 10^{-3}$	$1.18\ 10^{-4}$	0	0	$1.66\ 10^{-3}$	$5.69\ 10^{-2}$
Pb-212	-	$6.74\ 10^{-5}$	$2.29\ 10^{-12}$	$6.74\ 10^{-5}$	-	$2.29\ 10^{-12}$	-	-	-	0	$6.74\ 10^{-5}$
Pd-107	$2.04\ 10^{-14}$	$1.41\ 10^{-10}$	0	$1.41\ 10^{-10}$	$1.48\ 10^{-5}$	$1.48\ 10^{-5}$	$2.64\ 10^{-5}$	$2.51\ 10^{-7}$	0	$4.14\ 10^{-5}$	$4.14\ 10^{-5}$
Pm-145	-	0	$2.89\ 10^{-6}$	$2.89\ 10^{-6}$	$6.18\ 10^{-3}$	$6.18\ 10^{-3}$	$7.47\ 10^{-3}$	$2.98\ 10^{-4}$	$5.78\ 10^{-5}$	$1.40\ 10^{-2}$	$1.40\ 10^{-2}$
Pm-147	$1.50\ 10^{-1}$	$9.23\ 10^{-1}$	$1.07\ 10^{-1}$	$1.03\ 10^{0}$	$8.55\ 10^{-1}$	$9.63\ 10^{-1}$	$5.86\ 10^{-2}$	$1.94\ 10^{-2}$	$1.78\ 10^{-5}$	$9.33\ 10^{-1}$	$1.96\ 10^{0}$
Po-208	-	$2.45\ 10^{-6}$	$2.67\ 10^{-10}$	$2.45\ 10^{-6}$	-	$2.67\ 10^{-10}$	-	-	-	0	$2.45\ 10^{-6}$

Radionuclide or Radionuclide Group	Activity (TBq)										
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total forward vaults	Total vaults
Po-210	$1.01\ 10^{-2}$	$1.09\ 10^{-1}$	$5.47\ 10^{-3}$	$1.15\ 10^{-1}$	$1.25\ 10^{-3}$	$6.72\ 10^{-3}$	$5.93\ 10^{-6}$	0	0	$1.25\ 10^{-3}$	$1.16\ 10^{-1}$
Pr-144	-	$1.76\ 10^{-5}$	$4.63\ 10^{-14}$	$1.76\ 10^{-5}$	-	$4.63\ 10^{-14}$	-	-	-	0	$1.76\ 10^{-5}$
Pr-144m	-	$2.22\ 10^{-7}$	$5.19\ 10^{-16}$	$2.22\ 10^{-7}$	-	$5.19\ 10^{-16}$	-	-	-	0	$2.22\ 10^{-7}$
Pt-193	-	$3.24\ 10^{-5}$	$6.62\ 10^{-5}$	$9.86\ 10^{-5}$	$7.51\ 10^{-5}$	$1.41\ 10^{-4}$	$3.53\ 10^{-1}$	0	0	$3.54\ 10^{-1}$	$3.54\ 10^{-1}$
Pu-236	$1.38\ 10^{-5}$	$2.96\ 10^{-5}$	$5.01\ 10^{-9}$	$2.96\ 10^{-5}$	$1.15\ 10^{-10}$	$5.12\ 10^{-9}$	$3.20\ 10^{-14}$	0	0	$1.15\ 10^{-10}$	$2.97\ 10^{-5}$
Pu-238	$2.08\ 10^{-1}$	$2.62\ 10^{-1}$	$6.47\ 10^{-2}$	$3.26\ 10^{-1}$	$1.84\ 10^{0}$	$1.91\ 10^{0}$	$7.81\ 10^{-1}$	$1.12\ 10^{0}$	$2.71\ 10^{-3}$	$3.74\ 10^{0}$	$4.07\ 10^{0}$
Pu-239	$1.61\ 10^{0}$	$4.27\ 10^{-1}$	$1.36\ 10^{-1}$	$5.63\ 10^{-1}$	$3.06\ 10^{0}$	$3.19\ 10^{0}$	$7.37\ 10^{0}$	$1.72\ 10^{1}$	$1.11\ 10^{-2}$	$2.76\ 10^{1}$	$2.82\ 10^{1}$
Pu-240	$8.17\ 10^{-1}$	$2.48\ 10^{-1}$	$1.12\ 10^{-1}$	$3.60\ 10^{-1}$	$1.76\ 10^{0}$	$1.87\ 10^{0}$	$1.77\ 10^{0}$	$2.92\ 10^{0}$	$4.97\ 10^{-3}$	$6.45\ 10^{0}$	$6.81\ 10^{0}$
Pu-241	$1.46\ 10^{1}$	$7.79\ 10^{0}$	$2.14\ 10^{0}$	$9.93\ 10^{0}$	$3.02\ 10^{1}$	$3.23\ 10^{1}$	$2.34\ 10^{1}$	$3.22\ 10^{1}$	$8.75\ 10^{-2}$	$8.59\ 10^{1}$	$9.58\ 10^{1}$
Pu-242	$1.58\ 10^{-4}$	$9.06\ 10^{-4}$	$2.18\ 10^{-5}$	$9.28\ 10^{-4}$	$2.85\ 10^{-3}$	$2.87\ 10^{-3}$	$9.43\ 10^{-4}$	$1.28\ 10^{-5}$	$2.19\ 10^{-6}$	$3.80\ 10^{-3}$	$4.73\ 10^{-3}$
Pu-244	-	$2.54\ 10^{-11}$	$6.69\ 10^{-12}$	$3.21\ 10^{-11}$	-	$6.69\ 10^{-12}$	-	-	-	0	$3.21\ 10^{-11}$
PUALD	-	$1.02\ 10^{-1}$	$9.03\ 10^{-2}$	$1.92\ 10^{-1}$	-	$9.03\ 10^{-2}$	-	-	-	0	$1.92\ 10^{-1}$

Radionuclide or Radionuclide Group	Activity (TBq)										
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total forward vaults	Total vaults
Ra-223	-	$5.48\ 10^{-12}$	$2.00\ 10^{-8}$	$2.00\ 10^{-8}$	$7.70\ 10^{-5}$	$7.70\ 10^{-5}$	$5.57\ 10^{-6}$	0	0	$8.25\ 10^{-5}$	$8.25\ 10^{-5}$
Ra-225	$7.17\ 10^{-8}$	$2.05\ 10^{-6}$	$5.05\ 10^{-10}$	$2.06\ 10^{-6}$	$2.63\ 10^{-6}$	$2.63\ 10^{-6}$	$1.03\ 10^{-4}$	0	0	$1.06\ 10^{-4}$	$1.08\ 10^{-4}$
Ra-226	$2.90\ 10^{-1}$	$9.00\ 10^{-2}$	$1.85\ 10^{-2}$	$1.08\ 10^{-1}$	$6.54\ 10^{-3}$	$2.50\ 10^{-2}$	$2.94\ 10^{-4}$	0	0	$6.83\ 10^{-3}$	$1.15\ 10^{-1}$
Ra-228	$1.90\ 10^{0}$	$3.83\ 10^{-2}$	$5.63\ 10^{-3}$	$4.40\ 10^{-2}$	$6.49\ 10^{-4}$	$6.28\ 10^{-3}$	$3.01\ 10^{-5}$	0	0	$6.79\ 10^{-4}$	$4.46\ 10^{-2}$
Rb-87	-	$3.08\ 10^{-14}$	0	$3.08\ 10^{-14}$	0	0	$2.31\ 10^{-4}$	0	0	$2.31\ 10^{-4}$	$2.31\ 10^{-4}$
Rh-102	-	$8.64\ 10^{-7}$	$1.05\ 10^{-12}$	$8.64\ 10^{-7}$	-	$1.05\ 10^{-12}$	-	-	-	0	$8.64\ 10^{-7}$
Rh-106	-	$5.45\ 10^{-4}$	$1.09\ 10^{-12}$	$5.45\ 10^{-4}$	-	$1.09\ 10^{-12}$	-	-	-	0	$5.45\ 10^{-4}$
RRNAD	-	0	$2.47\ 10^{-6}$	$2.47\ 10^{-6}$	-	$2.47\ 10^{-6}$	-	-	-	0	$2.47\ 10^{-6}$
Ru-103	$1.14\ 10^{-2}$	$1.36\ 10^{-2}$	$2.26\ 10^{-4}$	$1.38\ 10^{-2}$	-	$2.26\ 10^{-4}$	-	-	-	0	$1.38\ 10^{-2}$
Ru-106	$8.21\ 10^{-1}$	$1.32\ 10^{0}$	$9.55\ 10^{-2}$	$1.41\ 10^{0}$	$2.98\ 10^{-1}$	$3.94\ 10^{-1}$	$9.43\ 10^{-1}$	$1.58\ 10^{0}$	$7.84\ 10^{-4}$	$2.83\ 10^{0}$	$4.24\ 10^{0}$
S-35	$3.04\ 10^{-3}$	$1.03\ 10^{-2}$	$4.05\ 10^{-2}$	$5.08\ 10^{-2}$	-	$4.05\ 10^{-2}$	-	-	-	0	$5.08\ 10^{-2}$
Sb-124	$3.26\ 10^{-5}$	$9.78\ 10^{-5}$	$3.47\ 10^{-4}$	$4.45\ 10^{-4}$	-	$3.47\ 10^{-4}$	-	-	-	0	$4.45\ 10^{-4}$

Radionuclide or Radionuclide Group	Activity (TBq)										
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total forward vaults	Total vaults
Sb-125	$1.57\ 10^{-1}$	$2.86\ 10^{-1}$	$3.14\ 10^{-2}$	$3.18\ 10^{-1}$	$1.82\ 10^{-1}$	$2.13\ 10^{-1}$	$1.75\ 10^{-1}$	$1.53\ 10^{-2}$	$1.21\ 10^{-5}$	$3.72\ 10^{-1}$	$6.90\ 10^{-1}$
Sb-126	-	$1.49\ 10^{-10}$	0	$1.49\ 10^{-10}$	$1.62\ 10^{-1}$	$1.62\ 10^{-1}$	$1.83\ 10^{-1}$	0	0	$3.45\ 10^{-1}$	$3.45\ 10^{-1}$
Sc-46	$9.25\ 10^{-5}$	$2.82\ 10^{-4}$	$1.21\ 10^{-4}$	$4.03\ 10^{-4}$	-	$1.21\ 10^{-4}$	-	-	-	0	$4.03\ 10^{-4}$
Se-75	$2.66\ 10^{-3}$	$6.72\ 10^{-2}$	$1.15\ 10^{-4}$	$6.73\ 10^{-2}$	-	$1.15\ 10^{-4}$	-	-	-	0	$6.73\ 10^{-2}$
Se-79	$1.93\ 10^{-13}$	$4.90\ 10^{-10}$	0	$4.90\ 10^{-10}$	$2.55\ 10^{-5}$	$2.55\ 10^{-5}$	$3.78\ 10^{-5}$	$2.15\ 10^{-7}$	$1.75\ 10^{-10}$	$6.34\ 10^{-5}$	$6.34\ 10^{-5}$
Sm-147	-	$1.36\ 10^{-14}$	0	$1.36\ 10^{-14}$	$2.29\ 10^{-14}$	$2.29\ 10^{-14}$	$1.24\ 10^{-8}$	0	0	$1.24\ 10^{-8}$	$1.24\ 10^{-8}$
Sm-151	$3.00\ 10^{-3}$	$2.46\ 10^{-2}$	$2.43\ 10^{-2}$	$4.89\ 10^{-2}$	$5.34\ 10^{-1}$	$5.59\ 10^{-1}$	$4.00\ 10^{-1}$	$3.12\ 10^{-1}$	$7.71\ 10^{-2}$	$1.32\ 10^{0}$	$1.37\ 10^{0}$
Sn-113	$2.82\ 10^{-5}$	$1.46\ 10^{-3}$	$1.61\ 10^{-6}$	$1.47\ 10^{-3}$	-	$1.61\ 10^{-6}$	-	-	-	0	$1.47\ 10^{-3}$
Sn-119m	$3.63\ 10^{-6}$	$9.16\ 10^{-5}$	$1.22\ 10^{-9}$	$9.16\ 10^{-5}$	$9.81\ 10^{-5}$	$9.81\ 10^{-5}$	$6.53\ 10^{-5}$	0	0	$1.63\ 10^{-4}$	$2.55\ 10^{-4}$
Sn-121	-	$4.15\ 10^{-5}$	$1.33\ 10^{-6}$	$4.28\ 10^{-5}$	-	$1.33\ 10^{-6}$	-	-	-	0	$4.28\ 10^{-5}$
Sn-121m	$2.88\ 10^{-12}$	$1.39\ 10^{-6}$	$2.23\ 10^{-5}$	$2.36\ 10^{-5}$	$1.99\ 10^{-1}$	$1.99\ 10^{-1}$	$4.20\ 10^{-1}$	$1.37\ 10^{-4}$	$1.40\ 10^{-5}$	$6.20\ 10^{-1}$	$6.20\ 10^{-1}$
Sn-123	-	0	0	0	$8.63\ 10^{-7}$	$8.63\ 10^{-7}$	$5.75\ 10^{-7}$	0	0	$1.44\ 10^{-6}$	$1.44\ 10^{-6}$

Radionuclide or Radionuclide Group	Activity (TBq)										
	Trench	**Vault 8**	**Disposed Vault 9 and 9a**	**Total disposed vaults**	**Forward Vault 9 and 9a**	**Total Vault 9 and 9a**	**Vault 10**	**Vault 11**	**Vault 12**	**Total forward vaults**	**Total vaults**
Sn-126	4.73 10^{-14}	1.06 10^{-9}	1.20 10^{-8}	1.31 10^{-8}	1.05 10^{-4}	1.06 10^{-4}	1.03 10^{-4}	2.26 10^{-7}	0	2.08 10^{-4}	2.08 10^{-4}
Sr-85	8.40 10^{-5}	7.93 10^{-4}	4.12 10^{-6}	7.98 10^{-4}	-	4.12 10^{-6}	-	-	-	0	7.98 10^{-4}
Sr-89	2.81 10^{-3}	7.26 10^{-4}	1.75 10^{-7}	7.26 10^{-4}	-	1.75 10^{-7}	-	-	-	0	7.26 10^{-4}
Sr-90	3.64 10^{0}	8.56 10^{0}	2.57 10^{0}	1.11 10^{1}	1.84 10^{1}	2.09 10^{1}	4.57 10^{1}	8.92 10^{1}	4.68 10^{-2}	1.53 10^{2}	1.64 10^{2}
Ta-182	1.08 10^{-6}	1.45 10^{-3}	4.00 10^{-4}	1.85 10^{-3}	-	4.00 10^{-4}	-	-	-	0	1.85 10^{-3}
Tc-97	-	0	0	0	0	0	6.07 10^{-7}	0	0	6.07 10^{-7}	6.07 10^{-7}
Tc-99	2.05 10^{-1}	2.58 10^{0}	1.54 10^{-1}	2.73 10^{0}	2.64 10^{-1}	4.18 10^{-1}	3.30 10^{-1}	2.87 10^{-1}	1.87 10^{-2}	8.99 10^{-1}	3.63 10^{0}
Te-125m	6.99 10^{-4}	1.08 10^{-3}	2.43 10^{-4}	1.32 10^{-3}	7.32 10^{-3}	7.57 10^{-3}	4.81 10^{-3}	1.00 10^{-8}	0	1.21 10^{-2}	1.35 10^{-2}
Te-127m	-	0	0	0	3.01 10^{-7}	3.01 10^{-7}	2.38 10^{-7}	0	0	5.39 10^{-7}	5.39 10^{-7}
Th-227	-	5.48 10^{-12}	2.00 10^{-8}	2.00 10^{-8}	7.59 10^{-5}	7.59 10^{-5}	5.50 10^{-6}	0	0	8.14 10^{-5}	8.14 10^{-5}
Th-228	1.25 10^{0}	6.49 10^{-2}	5.61 10^{-3}	7.05 10^{-2}	1.86 10^{-3}	7.46 10^{-3}	5.93 10^{-4}	0	0	2.45 10^{-3}	7.30 10^{-2}
Th-229	9.26 10^{-7}	2.21 10^{-7}	1.01 10^{-7}	3.22 10^{-7}	2.68 10^{-6}	2.78 10^{-6}	1.03 10^{-4}	0	0	1.06 10^{-4}	1.06 10^{-4}

Radionuclide or Radionuclide Group	Activity (TBq)										
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total forward vaults	Total vaults
Th-230	$2.30\ 10^{-4}$	$6.58\ 10^{-3}$	$7.85\ 10^{-4}$	$7.37\ 10^{-3}$	$5.65\ 10^{-4}$	$1.35\ 10^{-3}$	$2.63\ 10^{-4}$	0	0	$8.28\ 10^{-4}$	$8.20\ 10^{-3}$
Th-231	-	0	$1.01\ 10^{-5}$	$1.01\ 10^{-5}$	-	$1.01\ 10^{-5}$	-	-	-	0	$1.01\ 10^{-5}$
Th-232	$1.28\ 10^{0}$	$7.36\ 10^{-2}$	$9.03\ 10^{-4}$	$7.45\ 10^{-2}$	$2.02\ 10^{-3}$	$2.92\ 10^{-3}$	$7.31\ 10^{-4}$	$2.23\ 10^{-8}$	0	$2.75\ 10^{-3}$	$7.73\ 10^{-2}$
Th-234	$2.06\ 10^{-4}$	$2.41\ 10^{-5}$	$6.57\ 10^{-4}$	$6.82\ 10^{-4}$	$1.38\ 10^{-2}$	$1.44\ 10^{-2}$	$4.66\ 10^{-3}$	$1.04\ 10^{-7}$	0	$1.84\ 10^{-2}$	$1.91\ 10^{-2}$
Tl-204	$1.59\ 10^{-3}$	$2.50\ 10^{-2}$	$4.32\ 10^{-4}$	$2.55\ 10^{-2}$	$1.41\ 10^{-2}$	$1.45\ 10^{-2}$	$1.62\ 10^{-1}$	$1.05\ 10^{-6}$	0	$1.76\ 10^{-1}$	$2.02\ 10^{-1}$
Tm-170	-	0	0	0	0	0	0	0	0	0	0
Tm-171	-	0	0	0	$3.09\ 10^{-4}$	$3.09\ 10^{-4}$	$1.32\ 10^{-6}$	0	0	$3.10\ 10^{-4}$	$3.10\ 10^{-4}$
U-232	$6.73\ 10^{-4}$	$9.69\ 10^{-4}$	$3.33\ 10^{-4}$	$1.30\ 10^{-3}$	$1.43\ 10^{-3}$	$1.77\ 10^{-3}$	$4.60\ 10^{-4}$	$5.39\ 10^{-6}$	0	$1.90\ 10^{-3}$	$3.20\ 10^{-3}$
U-233	$2.72\ 10^{-4}$	$9.51\ 10^{-4}$	$9.31\ 10^{-6}$	$9.61\ 10^{-4}$	$1.12\ 10^{-2}$	$1.12\ 10^{-2}$	$2.08\ 10^{-2}$	$1.08\ 10^{-9}$	$9.43\ 10^{-10}$	$3.20\ 10^{-2}$	$3.29\ 10^{-2}$
U-234	$5.88\ 10^{0}$	$6.42\ 10^{-1}$	$8.38\ 10^{-2}$	$7.25\ 10^{-1}$	$4.11\ 10^{-1}$	$4.94\ 10^{-1}$	$2.24\ 10^{-1}$	$1.34\ 10^{-1}$	$9.29\ 10^{-5}$	$7.69\ 10^{-1}$	$1.49\ 10^{0}$
U-235	$2.83\ 10^{-1}$	$2.87\ 10^{-2}$	$3.21\ 10^{-3}$	$3.19\ 10^{-2}$	$1.38\ 10^{-2}$	$1.70\ 10^{-2}$	$7.71\ 10^{-3}$	$4.65\ 10^{-3}$	$3.49\ 10^{-6}$	$2.62\ 10^{-2}$	$5.80\ 10^{-2}$
U-236	$2.07\ 10^{-2}$	$2.33\ 10^{-2}$	$5.17\ 10^{-3}$	$2.84\ 10^{-2}$	$4.72\ 10^{-3}$	$9.90\ 10^{-3}$	$1.71\ 10^{-3}$	$7.08\ 10^{-5}$	$7.78\ 10^{-7}$	$6.51\ 10^{-3}$	$3.49\ 10^{-2}$

Radionuclide or Radionuclide Group	Activity (TBq)										
	Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total forward vaults	Total vaults
U-237	-	$1.72\ 10^{-7}$	$8.00\ 10^{-8}$	$2.52\ 10^{-7}$	-	$8.00\ 10^{-8}$	-	-	-	0	$2.52\ 10^{-7}$
U-238	$6.70\ 10^{0}$	$1.04\ 10^{0}$	$8.40\ 10^{-2}$	$1.12\ 10^{0}$	$6.72\ 10^{-2}$	$1.51\ 10^{-1}$	$9.58\ 10^{-2}$	$1.85\ 10^{-1}$	$1.17\ 10^{-4}$	$3.48\ 10^{-1}$	$1.47\ 10^{0}$
UALD	-	$5.14\ 10^{-2}$	$8.17\ 10^{-3}$	$5.96\ 10^{-2}$	-	$8.17\ 10^{-3}$	-	-	-	0	$5.96\ 10^{-2}$
URRM	-	$2.76\ 10^{-2}$	$1.79\ 10^{-2}$	$4.55\ 10^{-2}$	-	$1.79\ 10^{-2}$	-	-	-	0	$4.55\ 10^{-2}$
W-181	$5.42\ 10^{-6}$	$1.93\ 10^{-5}$	$2.12\ 10^{-6}$	$2.15\ 10^{-5}$	-	$2.12\ 10^{-6}$	-	-	-	0	$2.15\ 10^{-5}$
Y-88	-	0	$1.00\ 10^{-8}$	$1.00\ 10^{-8}$	-	$1.00\ 10^{-8}$	-	-	-	0	$1.00\ 10^{-8}$
Y-90	-	$8.80\ 10^{-2}$	$9.40\ 10^{-7}$	$8.80\ 10^{-2}$	-	$9.40\ 10^{-7}$	-	-	-	0	$8.80\ 10^{-2}$
Y-91	$3.88\ 10^{-9}$	$9.57\ 10^{-6}$	$8.29\ 10^{-15}$	$9.57\ 10^{-6}$	-	$8.29\ 10^{-15}$	-	-	-	0	$9.57\ 10^{-6}$
Zn-65	$4.64\ 10^{-2}$	$9.24\ 10^{-1}$	$4.02\ 10^{-3}$	$9.28\ 10^{-1}$	$1.88\ 10^{-1}$	$1.92\ 10^{-1}$	$1.77\ 10^{-1}$	$1.33\ 10^{-2}$	$6.75\ 10^{-8}$	$3.78\ 10^{-1}$	$1.31\ 10^{0}$
Zr-93	$1.81\ 10^{-2}$	$2.14\ 10^{-1}$	$3.08\ 10^{-5}$	$2.14\ 10^{-1}$	$3.71\ 10^{-1}$	$3.71\ 10^{-1}$	$5.26\ 10^{-1}$	$2.58\ 10^{-4}$	$1.18\ 10^{-7}$	$8.97\ 10^{-1}$	$1.11\ 10^{0}$
Zr-95	$4.49\ 10^{-2}$	$1.07\ 10^{-1}$	$4.19\ 10^{-3}$	$1.11\ 10^{-1}$	-	$4.19\ 10^{-3}$	-	-	-	0	$1.11\ 10^{-1}$
Total	$5.65\ 10^{2}$	$1.01\ 10^{2}$	$2.05\ 10^{1}$	$1.22\ 10^{2}$	$6.98\ 10^{3}$	$7.00\ 10^{3}$	$7.17\ 10^{3}$	$1.56\ 10^{3}$	$1.16\ 10^{3}$	$1.69\ 10^{4}$	$1.70\ 10^{4}$

B2 Volumes

Table B.2: Summary of waste and emplaced volumes in the Stage 3 Reference Inventory

Volume type	Volume (m^3)										
	Total Trench	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward	Total Vaults
Raw waste volume	$8.15\ 10^5$	$7.91\ 10^4$	$1.63\ 10^4$	$9.54\ 10^4$	$1.47\ 10^5$	$1.64\ 10^5$	$1.61\ 10^5$	$1.16\ 10^5$	$4.72\ 10^4$	$4.71\ 10^5$	$5.66\ 10^5$
Processed waste volume	$8.15\ 10^5$	$7.91\ 10^4$	$1.63\ 10^4$	$9.54\ 10^4$	$6.60\ 10^4$	$8.23\ 10^4$	$6.03\ 10^4$	$4.13\ 10^4$	$2.00\ 10^4$	$1.88\ 10^5$	$2.83\ 10^5$
Conditioned waste volume	-	$1.71\ 10^5$	$3.50\ 10^4$	$2.06\ 10^5$	$1.59\ 10^5$	$1.94\ 10^5$	$1.52\ 10^5$	$1.08\ 10^5$	$4.79\ 10^4$	$4.66\ 10^5$	$6.72\ 10^5$
Packaged waste volume	-	$1.96\ 10^5$	$3.85\ 10^4$	$2.34\ 10^5$	$1.60\ 10^5$	$1.98\ 10^5$	$1.52\ 10^5$	$1.08\ 10^5$	$4.79\ 10^4$	$4.67\ 10^5$	$7.02\ 10^5$
Emplaced waste volume	-	$3.27\ 10^5$	$6.42\ 10^4$	$3.91\ 10^5$	$2.17\ 10^5$	$2.81\ 10^5$	$1.99\ 10^5$	$1.41\ 10^5$	$6.06\ 10^4$	$6.17\ 10^5$	$1.01\ 10^6$

B3 Materials

Table B.3: Material masses in the vaults for the Stage 3 Reference Inventory. Tiered material groups are given in bold, which consist of the sum of the materials given in italic beneath them

Materials	Mass (t)									
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward Vaults	Total vaults
Total processed waste mass	$1.43\ 10^5$	$2.55\ 10^4$	$1.69\ 10^5$	$9.21\ 10^4$	$1.18\ 10^5$	$1.00\ 10^5$	$5.35\ 10^4$	$2.59\ 10^4$	$2.72\ 10^5$	$4.40\ 10^5$
Total stage 2 conditioned waste mass	$3.10\ 10^5$	$5.93\ 10^4$	$3.69\ 10^5$	$2.36\ 10^5$	$2.95\ 10^5$	$2.32\ 10^5$	$1.44\ 10^5$	$6.99\ 10^4$	$6.82\ 10^5$	$1.05\ 10^6$
Total disposal unit (stage 2 packaged) waste mass	$3.41\ 10^5$	$6.54\ 10^4$	$4.07\ 10^5$	$2.65\ 10^5$	$3.30\ 10^5$	$2.65\ 10^5$	$1.71\ 10^5$	$7.85\ 10^4$	$7.79\ 10^5$	$1.19\ 10^6$
Metals										
Ferrous stainless steel	$3.71\ 10^3$	$3.88\ 10^2$	$4.10\ 10^3$	$6.51\ 10^3$	$6.90\ 10^3$	$1.47\ 10^4$	$5.51\ 10^3$	$2.51\ 10^3$	$2.92\ 10^4$	$3.33\ 10^4$

Materials	Mass (t)									
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward Vaults	Total vaults
Ferrous excluding stainless steel (i.e. carbon steel)	$2.21\ 10^{4}$	$3.44\ 10^{3}$	$2.56\ 10^{4}$	$1.10\ 10^{4}$	$1.45\ 10^{4}$	$2.56\ 10^{4}$	$1.33\ 10^{4}$	$6.55\ 10^{3}$	$5.65\ 10^{4}$	$8.21\ 10^{4}$
Iron	$3.74\ 10^{2}$	$9.28\ 10^{2}$	$1.30\ 10^{3}$	$1.11\ 10^{3}$	$2.04\ 10^{3}$	$2.66\ 10^{2}$	$7.12\ 10^{1}$	$6.67\ 10^{0}$	$1.46\ 10^{3}$	$2.76\ 10^{3}$
Aluminium	$1.98\ 10^{3}$	$1.91\ 10^{2}$	$2.17\ 10^{3}$	$6.68\ 10^{2}$	$8.60\ 10^{2}$	$6.05\ 10^{2}$	$6.64\ 10^{1}$	$8.17\ 10^{-1}$	$1.34\ 10^{3}$	$3.51\ 10^{3}$
Beryllium	$3.98\ 10^{-1}$	$6.80\ 10^{-2}$	$4.66\ 10^{-1}$	$8.98\ 10^{0}$	$9.05\ 10^{0}$	$5.41\ 10^{0}$	$2.61\ 10^{-3}$	0	$1.44\ 10^{1}$	$1.49\ 10^{1}$
Cobalt	$1.81\ 10^{-1}$	$3.89\ 10^{-1}$	$5.69\ 10^{-1}$	$1.77\ 10^{1}$	$1.80\ 10^{1}$	$2.44\ 10^{0}$	$7.73\ 10^{-2}$	0	$2.02\ 10^{1}$	$2.07\ 10^{1}$
Copper	$1.62\ 10^{3}$	$9.43\ 10^{1}$	$1.71\ 10^{3}$	$3.66\ 10^{2}$	$4.61\ 10^{2}$	$5.10\ 10^{2}$	$7.90\ 10^{1}$	$1.75\ 10^{0}$	$9.57\ 10^{2}$	$2.67\ 10^{3}$
Lead	$4.08\ 10^{3}$	$2.68\ 10^{2}$	$4.35\ 10^{3}$	$1.06\ 10^{3}$	$1.33\ 10^{3}$	$4.57\ 10^{3}$	$5.93\ 10^{2}$	$6.51\ 10^{0}$	$6.22\ 10^{3}$	$1.06\ 10^{4}$
Magnox	$6.69\ 10^{2}$	$6.08\ 10^{1}$	$7.30\ 10^{2}$	$6.23\ 10^{2}$	$6.84\ 10^{2}$	$1.85\ 10^{2}$	$1.50\ 10^{-1}$	0	$8.09\ 10^{2}$	$1.54\ 10^{3}$
Nickel	$9.62\ 10^{2}$	$4.51\ 10^{1}$	$1.01\ 10^{3}$	$4.59\ 10^{1}$	$9.10\ 10^{1}$	$1.82\ 10^{1}$	$1.06\ 10^{0}$	0	$6.52\ 10^{1}$	$1.07\ 10^{3}$
Titanium	$1.29\ 10^{-1}$	$5.45\ 10^{-1}$	$6.74\ 10^{-1}$	$6.47\ 10^{0}$	$7.02\ 10^{0}$	$5.54\ 10^{-1}$	0	0	$7.03\ 10^{0}$	$7.70\ 10^{0}$
Uranium	$8.85\ 10^{1}$	$7.55\ 10^{0}$	$9.61\ 10^{1}$	$1.23\ 10^{1}$	$1.98\ 10^{1}$	$3.98\ 10^{0}$	$1.34\ 10^{-2}$	0	$1.63\ 10^{1}$	$1.12\ 10^{2}$

Materials	Mass (t)									
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward Vaults	Total vaults
Zinc	$4.38\ 10^{2}$	$1.23\ 10^{1}$	$4.50\ 10^{2}$	$2.17\ 10^{2}$	$2.29\ 10^{2}$	$4.99\ 10^{1}$	$3.18\ 10^{0}$	$2.39\ 10^{-1}$	$2.70\ 10^{2}$	$7.20\ 10^{2}$
Zirconium	$6.45\ 10^{2}$	$1.09\ 10^{1}$	$6.56\ 10^{2}$	$1.79\ 10^{1}$	$2.88\ 10^{1}$	$1.52\ 10^{1}$	$1.50\ 10^{-1}$	0	$3.33\ 10^{1}$	$6.89\ 10^{2}$
Zirconium/zircaloy	0	0	0	-	0	-	-	-	0	0
Other metals	$4.74\ 10^{3}$	$3.50\ 10^{1}$	$4.77\ 10^{3}$	$5.60\ 10^{2}$	$5.95\ 10^{2}$	$2.74\ 10^{2}$	$1.74\ 10^{3}$	$8.85\ 10^{2}$	$3.45\ 10^{3}$	$8.23\ 10^{3}$
Brass	$9.80\ 10^{2}$	$7.21\ 10^{0}$	$9.87\ 10^{2}$	-	$7.21\ 10^{0}$	-	-	-	0	$9.87\ 10^{2}$
Bronze	$4.69\ 10^{2}$	$3.44\ 10^{0}$	$4.72\ 10^{2}$	-	$3.44\ 10^{0}$	-	-	-	0	$4.72\ 10^{2}$
Inconel	$9.55\ 10^{2}$	$6.97\ 10^{0}$	$9.62\ 10^{2}$	-	$6.97\ 10^{0}$	-	-	-	0	$9.62\ 10^{2}$
Nimonic	$7.13\ 10^{2}$	$5.20\ 10^{0}$	$7.18\ 10^{2}$	-	$5.20\ 10^{0}$	-	-	-	0	$7.18\ 10^{2}$
Stellite	$7.29\ 10^{2}$	$5.32\ 10^{0}$	$7.34\ 10^{2}$	-	$5.32\ 10^{0}$	-	-	-	0	$7.34\ 10^{2}$
Dural	$8.65\ 10^{1}$	$6.33\ 10^{-1}$	$8.71\ 10^{1}$	-	$6.33\ 10^{-1}$	-	-	-	0	$8.71\ 10^{1}$
Monel	$4.58\ 10^{2}$	$3.34\ 10^{0}$	$4.62\ 10^{2}$	-	$3.34\ 10^{0}$	-	-	-	0	$4.62\ 10^{2}$
Manganese	$5.52\ 10^{-2}$	$5.81\ 10^{-2}$	$1.13\ 10^{-1}$	-	$5.81\ 10^{-2}$	-	-	-	0	$1.13\ 10^{-1}$

Materials	Mass (t)									
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward Vaults	Total vaults
Sodium	0	$1.20\ 10^{-5}$	$1.20\ 10^{-5}$	-	$1.20\ 10^{-5}$	-	-	-	0	$1.20\ 10^{-5}$
Neodymium	$2.16\ 10^{-2}$	0	$2.16\ 10^{-2}$	-	0	-	-	-	0	$2.16\ 10^{-2}$
Mazel	0	$2.52\ 10^{-1}$	$2.52\ 10^{-1}$	-	$2.52\ 10^{-1}$	-	-	-	0	$2.52\ 10^{-1}$
Unknown ferrous metal	$3.50\ 10^{2}$	$2.55\ 10^{0}$	$3.53\ 10^{2}$	-	$2.55\ 10^{0}$	-	-	-	0	$3.53\ 10^{2}$
Unknown metals	$1.27\ 10^{4}$	$2.62\ 10^{3}$	$1.54\ 10^{4}$	-	$2.62\ 10^{3}$	-	-	-	0	$1.54\ 10^{4}$
Organics										
Total cellulosics	$7.61\ 10^{3}$	$1.00\ 10^{3}$	$8.61\ 10^{3}$	$2.38\ 10^{3}$	$3.39\ 10^{3}$	$8.43\ 10^{2}$	$2.98\ 10^{2}$	$3.68\ 10^{1}$	$3.56\ 10^{3}$	$1.22\ 10^{4}$
Paper and cotton	0	0	0	$1.63\ 10^{3}$	$1.63\ 10^{3}$	$1.26\ 10^{2}$	$4.36\ 10^{1}$	$2.78\ 10^{1}$	$1.83\ 10^{3}$	$1.83\ 10^{3}$

Materials	Mass (t)									
	Vault 8	**Disposed Vault 9 and 9a**	**Total disposed vaults**	**Forward Vault 9 and 9a**	**Total Vault 9 and 9a**	**Vault 10**	**Vault 11**	**Vault 12**	**Total Forward Vaults**	**Total vaults**
Wood	$4.72\ 10^3$	$7.48\ 10^2$	$5.47\ 10^3$	$7.50\ 10^2$	$1.50\ 10^3$	$7.17\ 10^2$	$2.54\ 10^2$	$9.00\ 10^0$	$1.73\ 10^3$	$7.20\ 10^3$
Paper	$1.85\ 10^3$	$2.29\ 10^2$	$2.08\ 10^3$	-	$2.29\ 10^2$	-	-	-	0	$2.08\ 10^3$
Other cellulosics	0	0	0	-	0	-	-	-	0	0
Unknown cellulosics	$1.03\ 10^3$	$2.65\ 10^1$	$1.06\ 10^3$	-	$2.65\ 10^1$	-	-	-	0	$1.06\ 10^3$
Halogenated plastics	$2.79\ 10^3$	$8.72\ 10^2$	$3.66\ 10^3$	$2.49\ 10^3$	$3.36\ 10^3$	$1.30\ 10^3$	$3.10\ 10^2$	$1.24\ 10^2$	$4.22\ 10^3$	$7.88\ 10^3$
Total non-halogenated plastics	$3.00\ 10^3$	$6.26\ 10^2$	$3.63\ 10^3$	$1.99\ 10^3$	$2.62\ 10^3$	$8.34\ 10^2$	$2.11\ 10^2$	$9.73\ 10^0$	$3.05\ 10^3$	$6.68\ 10^3$
Condensation polymers	$6.74\ 10^2$	$5.69\ 10^1$	$7.31\ 10^2$	$9.14\ 10^2$	$9.71\ 10^2$	$3.62\ 10^2$	$1.05\ 10^2$	$4.86\ 10^0$	$1.39\ 10^3$	$2.12\ 10^3$

Materials	Mass (t)									
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward Vaults	Total vaults
Thermoplastics (other non-halogenated plastics)	$1.02\ 10^{3}$	$2.15\ 10^{2}$	$1.23\ 10^{3}$	$1.08\ 10^{3}$	$1.30\ 10^{3}$	$4.72\ 10^{2}$	$1.06\ 10^{2}$	$4.86\ 10^{0}$	$1.66\ 10^{3}$	$2.89\ 10^{3}$
Unknown non-halogenated plastics	$1.31\ 10^{3}$	$3.54\ 10^{2}$	$1.66\ 10^{3}$	-	$3.54\ 10^{2}$	-	-	-	0	$1.66\ 10^{3}$
Ion exchange resins	$3.30\ 10^{2}$	0	$3.30\ 10^{2}$	$4.62\ 10^{2}$	$4.62\ 10^{2}$	$1.93\ 10^{1}$	0	0	$4.81\ 10^{2}$	$8.11\ 10^{2}$
Unknown plastics	$7.38\ 10^{2}$	$1.54\ 10^{2}$	$8.92\ 10^{2}$	-	$1.54\ 10^{2}$	-	-	-	0	$8.92\ 10^{2}$
Total rubber	$5.68\ 10^{3}$	$9.78\ 10^{2}$	$6.66\ 10^{3}$	$9.29\ 10^{2}$	$1.91\ 10^{3}$	$1.00\ 10^{3}$	$5.14\ 10^{1}$	$3.00\ 10^{0}$	$1.99\ 10^{3}$	$8.64\ 10^{3}$
Halogenated rubber	$7.72\ 10^{2}$	$5.79\ 10^{1}$	$8.30\ 10^{2}$	$5.24\ 10^{2}$	$5.82\ 10^{2}$	$5.22\ 10^{2}$	$2.57\ 10^{1}$	$1.50\ 10^{0}$	$1.07\ 10^{3}$	$1.90\ 10^{3}$
Non-halogenated rubber	$8.44\ 10^{2}$	$1.02\ 10^{2}$	$9.45\ 10^{2}$	$4.05\ 10^{2}$	$5.07\ 10^{2}$	$4.82\ 10^{2}$	$2.57\ 10^{1}$	$1.50\ 10^{0}$	$9.14\ 10^{2}$	$1.86\ 10^{3}$
Nitrile rubber	$8.92\ 10^{-2}$	0	$8.92\ 10^{-2}$	-	0	-	-	-	0	$8.92\ 10^{-2}$
Unknown rubber	$4.06\ 10^{3}$	$8.19\ 10^{2}$	$4.88\ 10^{3}$	-	$8.19\ 10^{2}$	-	-	-	0	$4.88\ 10^{3}$

Materials	Mass (t)									
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward Vaults	Total vaults
Hydrocarbons	$5.73\ 10^{1}$	$3.27\ 10^{2}$	$3.84\ 10^{2}$	$2.65\ 10^{2}$	$5.92\ 10^{2}$	$1.89\ 10^{2}$	$1.44\ 10^{1}$	$4.52\ 10^{-1}$	$4.69\ 10^{2}$	$8.53\ 10^{2}$
Oils grease	0	0	0	$8.35\ 10^{1}$	$8.35\ 10^{1}$	$3.68\ 10^{1}$	$3.94\ 10^{-2}$	$1.09\ 10^{-2}$	$1.20\ 10^{2}$	$1.20\ 10^{2}$
Fuel	0	0	0	$1.08\ 10^{-1}$	$1.08\ 10^{-1}$	0	0	0	$1.08\ 10^{-1}$	$1.08\ 10^{-1}$
Asphalt tarmac (cont. coal tar)	$5.56\ 10^{1}$	$2.92\ 10^{2}$	$3.47\ 10^{2}$	$7.20\ 10^{1}$	$3.64\ 10^{2}$	$3.66\ 10^{1}$	$1.06\ 10^{1}$	$3.26\ 10^{-1}$	$1.19\ 10^{2}$	$4.67\ 10^{2}$
Asphalt tarmac	0	$1.35\ 10^{-1}$	$1.35\ 10^{-1}$	$3.91\ 10^{1}$	$3.92\ 10^{1}$	$2.34\ 10^{1}$	$2.21\ 10^{0}$	$6.52\ 10^{-2}$	$6.48\ 10^{1}$	$6.49\ 10^{1}$
Bitumen	$1.04\ 10^{0}$	$3.17\ 10^{1}$	$3.27\ 10^{1}$	$7.01\ 10^{1}$	$1.02\ 10^{2}$	$9.26\ 10^{1}$	$1.59\ 10^{0}$	$4.95\ 10^{-2}$	$1.64\ 10^{2}$	$1.97\ 10^{2}$
Coal tar	0	$2.64\ 10^{0}$	$2.64\ 10^{0}$	-	$2.64\ 10^{0}$	-	-	-	0	$2.64\ 10^{0}$
Other hydrocarbons	$3.03\ 10^{-1}$	$4.61\ 10^{-1}$	$7.63\ 10^{-1}$	$1.08\ 10^{-1}$	$5.69\ 10^{-1}$	0	0	0	$1.08\ 10^{-1}$	$8.71\ 10^{-1}$
Other organics	$5.68\ 10^{3}$	$1.34\ 10^{3}$	$7.02\ 10^{3}$	$6.23\ 10^{2}$	$1.96\ 10^{3}$	$9.35\ 10^{2}$	$4.82\ 10^{2}$	$4.26\ 10^{2}$	$2.47\ 10^{3}$	$9.48\ 10^{3}$
Unknown organics	$7.84\ 10^{2}$	$6.94\ 10^{1}$	$8.53\ 10^{2}$	-	$6.94\ 10^{1}$	-	-	-	0	$8.53\ 10^{2}$
Other materials (Group defined in UKRWI. The mass of materials in this group should be included when calculating a total mass.)										

Materials	Mass (t)									
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward Vaults	Total vaults
Inorganic ion exchange	$1.30\ 10^{3}$	$7.12\ 10^{1}$	$1.37\ 10^{3}$	$1.03\ 10^{1}$	$8.15\ 10^{1}$	$2.28\ 10^{0}$	0	0	$1.25\ 10^{1}$	$1.39\ 10^{3}$
Inorganic sludge & flocs	$3.80\ 10^{2}$	$2.48\ 10^{2}$	$6.28\ 10^{2}$	$8.21\ 10^{2}$	$1.07\ 10^{3}$	$3.00\ 10^{3}$	$1.88\ 10^{3}$	$8.70\ 10^{2}$	$6.57\ 10^{3}$	$7.20\ 10^{3}$
Unknown inorganics	$1.36\ 10^{3}$	$4.39\ 10^{1}$	$1.41\ 10^{3}$	-	$4.39\ 10^{1}$	-	-	-	0	$1.41\ 10^{3}$
Soil	$1.60\ 10^{4}$	$2.42\ 10^{3}$	$1.84\ 10^{4}$	$4.45\ 10^{2}$	$2.86\ 10^{3}$	$9.13\ 10^{2}$	$1.51\ 10^{3}$	$5.62\ 10^{2}$	$3.43\ 10^{3}$	$2.18\ 10^{4}$
Rubble	$1.10\ 10^{4}$	$2.11\ 10^{3}$	$1.31\ 10^{4}$	$3.38\ 10^{3}$	$5.49\ 10^{3}$	$1.47\ 10^{3}$	$1.54\ 10^{3}$	$5.66\ 10^{2}$	$6.96\ 10^{3}$	$2.00\ 10^{4}$
Cement/concrete	$7.98\ 10^{3}$	$1.97\ 10^{3}$	$9.94\ 10^{3}$	$5.06\ 10^{4}$	$5.26\ 10^{4}$	$2.41\ 10^{4}$	$1.82\ 10^{4}$	$1.10\ 10^{4}$	$1.04\ 10^{5}$	$1.14\ 10^{5}$
Sand	$3.78\ 10^{2}$	$9.31\ 10^{1}$	$4.71\ 10^{2}$	$7.32\ 10^{1}$	$1.66\ 10^{2}$	$1.65\ 10^{1}$	0	0	$8.97\ 10^{1}$	$5.61\ 10^{2}$
Glass/ceramics	$3.16\ 10^{3}$	$4.16\ 10^{2}$	$3.58\ 10^{3}$	$1.42\ 10^{2}$	$5.58\ 10^{2}$	$1.92\ 10^{2}$	$1.14\ 10^{1}$	$1.92\ 10^{0}$	$3.48\ 10^{2}$	$3.92\ 10^{3}$
Graphite	$4.59\ 10^{2}$	$8.19\ 10^{1}$	$5.41\ 10^{2}$	$1.73\ 10^{3}$	$1.81\ 10^{3}$	$6.42\ 10^{3}$	$3.74\ 10^{3}$	$2.35\ 10^{3}$	$1.42\ 10^{4}$	$1.48\ 10^{4}$
Desiccant	$1.28\ 10^{2}$	$5.71\ 10^{0}$	$1.33\ 10^{2}$	$4.71\ 10^{2}$	$4.76\ 10^{2}$	$9.22\ 10^{-1}$	0	0	$4.72\ 10^{2}$	$6.05\ 10^{2}$
Total asbestos	$2.47\ 10^{3}$	$3.77\ 10^{2}$	$2.84\ 10^{3}$	$3.88\ 10^{2}$	$7.65\ 10^{2}$	$1.77\ 10^{2}$	$3.22\ 10^{1}$	$3.18\ 10^{0}$	$6.00\ 10^{2}$	$3.44\ 10^{3}$

Materials	Mass (t)									
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward Vaults	Total vaults
Asbestos (no breakdown available)	$2.03\ 10^{3}$	$3.58\ 10^{2}$	$2.39\ 10^{3}$	0	$3.58\ 10^{2}$	-	-	-	0	$2.39\ 10^{3}$
Non/low friable	$9.97\ 10^{-1}$	$6.41\ 10^{0}$	$7.41\ 10^{0}$	$1.99\ 10^{2}$	$2.06\ 10^{2}$	$1.29\ 10^{2}$	$2.61\ 10^{1}$	$2.61\ 10^{0}$	$3.57\ 10^{2}$	$3.64\ 10^{2}$
Moderately friable	$2.63\ 10^{-1}$	$1.29\ 10^{0}$	$1.55\ 10^{0}$	$1.16\ 10^{2}$	$1.17\ 10^{2}$	$2.14\ 10^{1}$	$5.91\ 10^{0}$	$5.57\ 10^{-1}$	$1.44\ 10^{2}$	$1.45\ 10^{2}$
Highly friable	$2.24\ 10^{-2}$	$1.25\ 10^{-1}$	$1.47\ 10^{-1}$	$7.31\ 10^{1}$	$7.32\ 10^{1}$	$2.68\ 10^{1}$	$2.54\ 10^{-1}$	$1.40\ 10^{-2}$	$1.00\ 10^{2}$	$1.00\ 10^{2}$
Amosite	$1.84\ 10^{2}$	$1.31\ 10^{0}$	$1.86\ 10^{2}$	-	$1.31\ 10^{0}$	-	-	-	0	$1.86\ 10^{2}$
Crocidolite	$7.53\ 10^{0}$	$5.33\ 10^{-2}$	$7.59\ 10^{0}$	-	$5.33\ 10^{-2}$	-	-	-	0	$7.59\ 10^{0}$
Chrysotile	$2.40\ 10^{2}$	$1.00\ 10^{1}$	$2.50\ 10^{2}$	-	$1.00\ 10^{1}$	-	-	-	0	$2.50\ 10^{2}$
Aqueous liquid volume	$1.02\ 10^{3}$	$1.39\ 10^{2}$	$1.16\ 10^{3}$	$5.30\ 10^{1}$	$1.92\ 10^{2}$	$5.93\ 10^{0}$	$1.56\ 10^{-2}$	0	$5.89\ 10^{1}$	$1.22\ 10^{3}$
Non-aqueous liquid volume	$4.60\ 10^{2}$	$1.68\ 10^{1}$	$4.77\ 10^{2}$	0	$1.68\ 10^{1}$	0	0	0	0	$4.77\ 10^{2}$
Hydrated lime	$4.01\ 10^{1}$	0	$4.01\ 10^{1}$	-	0	-	-	-	0	$4.01\ 10^{1}$
Silt, sand and soil	$1.10\ 10^{-3}$	0	$1.10\ 10^{-3}$	-	0	-	-	-	0	$1.10\ 10^{-3}$

Materials	Mass (t)									
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward Vaults	Total vaults
Concrete/rubble	$1.92\ 10^{3}$	$2.51\ 10^{2}$	$2.17\ 10^{3}$	-	$2.51\ 10^{2}$	-	-	-	0	$2.17\ 10^{3}$
Powder/ash	$4.84\ 10^{2}$	$1.42\ 10^{2}$	$6.26\ 10^{2}$	$5.75\ 10^{1}$	$1.99\ 10^{2}$	$9.55\ 10^{0}$	0	0	$6.70\ 10^{1}$	$6.93\ 10^{2}$
Not declared	-	-	0	$2.57\ 10^{3}$	$2.57\ 10^{3}$	$1.17\ 10^{4}$	$3.83\ 10^{3}$	$2.32\ 10^{-1}$	$1.81\ 10^{4}$	$1.81\ 10^{4}$
Other UKRWI (Includes UKRWI groups 'Materials of interest for waste acceptance', 'Hazardous substances / non-hazardous pollutants'. For forward data, the mass of materials in this group should not be included when calculating a total mass.)										
Fluorides	$1.49\ 10^{-2}$	$5.35\ 10^{-2}$	$6.84\ 10^{-2}$	$4.67\ 10^{2}$	$4.67\ 10^{2}$	$2.35\ 10^{1}$	$2.32\ 10^{1}$	0	$5.14\ 10^{2}$	$5.14\ 10^{2}$
Chlorides	0	0	0	$4.68\ 10^{2}$	$4.68\ 10^{2}$	$2.36\ 10^{1}$	$2.32\ 10^{1}$	0	$5.15\ 10^{2}$	$5.15\ 10^{2}$
Iodides	0	0	0	$4.66\ 10^{2}$	$4.66\ 10^{2}$	$2.30\ 10^{1}$	$2.32\ 10^{1}$	0	$5.12\ 10^{2}$	$5.12\ 10^{2}$
Cyanides	0	0	0	0	0	0	0	0	0	0
Carbonates	0	0	0	$9.31\ 10^{2}$	$9.31\ 10^{2}$	$4.65\ 10^{1}$	$4.65\ 10^{1}$	0	$1.02\ 10^{3}$	$1.02\ 10^{3}$
Nitrates	0	0	0	$4.67\ 10^{2}$	$4.67\ 10^{2}$	$2.33\ 10^{1}$	$2.32\ 10^{1}$	0	$5.14\ 10^{2}$	$5.14\ 10^{2}$
Nitrites	0	0	0	$4.63\ 10^{2}$	$4.63\ 10^{2}$	$2.27\ 10^{1}$	$2.32\ 10^{1}$	0	$5.09\ 10^{2}$	$5.09\ 10^{2}$

Materials	Mass (t)									
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward Vaults	Total vaults
Phosphates	$3.44\ 10^{-3}$	$5.00\ 10^{-2}$	$5.34\ 10^{-2}$	$4.66\ 10^{2}$	$4.66\ 10^{2}$	$2.30\ 10^{1}$	$2.32\ 10^{1}$	0	$5.13\ 10^{2}$	$5.13\ 10^{2}$
Sulphates	0	0	0	$9.30\ 10^{2}$	$9.30\ 10^{2}$	$4.59\ 10^{1}$	$4.65\ 10^{1}$	0	$1.02\ 10^{3}$	$1.02\ 10^{3}$
Sulphides	0	0	0	$4.66\ 10^{2}$	$4.66\ 10^{2}$	$2.31\ 10^{1}$	$2.32\ 10^{1}$	0	$5.13\ 10^{2}$	$5.13\ 10^{2}$
Combustible metals	0	0	0	$4.58\ 10^{2}$	$4.58\ 10^{2}$	$1.55\ 10^{2}$	0	0	$6.13\ 10^{2}$	$6.13\ 10^{2}$
Low flash point liquids	0	0	0	$2.01\ 10^{-2}$	$2.01\ 10^{-2}$	0	0	0	$2.01\ 10^{-2}$	$2.01\ 10^{-2}$
Explosive materials	0	0	0	$4.02\ 10^{-4}$	$4.02\ 10^{-4}$	0	0	0	$4.02\ 10^{-4}$	$4.02\ 10^{-4}$
Phosphorus	0	0	0	$4.12\ 10^{-4}$	$4.12\ 10^{-4}$	$4.11\ 10^{-6}$	0	0	$4.16\ 10^{-4}$	$4.16\ 10^{-4}$
Hydrides	0	0	0	$4.02\ 10^{-4}$	$4.02\ 10^{-4}$	0	0	0	$4.02\ 10^{-4}$	$4.02\ 10^{-4}$
Biodegradable materials	$1.33\ 10^{2}$	$2.71\ 10^{1}$	$1.60\ 10^{2}$	$7.69\ 10^{2}$	$7.96\ 10^{2}$	$4.71\ 10^{2}$	$2.06\ 10^{2}$	$1.40\ 10^{1}$	$1.46\ 10^{3}$	$1.62\ 10^{3}$
Putrescible	$1.11\ 10^{1}$	$1.90\ 10^{0}$	$1.30\ 10^{1}$	$2.07\ 10^{2}$	$2.09\ 10^{2}$	$6.29\ 10^{1}$	$2.78\ 10^{1}$	$1.42\ 10^{0}$	$2.99\ 10^{2}$	$3.12\ 10^{2}$
Non-putrescible	$1.22\ 10^{2}$	$2.52\ 10^{1}$	$1.47\ 10^{2}$	$5.63\ 10^{2}$	$5.88\ 10^{2}$	$4.08\ 10^{2}$	$1.79\ 10^{2}$	$1.26\ 10^{1}$	$1.16\ 10^{3}$	$1.31\ 10^{3}$

Materials	Mass (t)									
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward Vaults	Total vaults
Biological pathogenic	0	0	0	$3.98\ 10^{1}$	$3.98\ 10^{1}$	$3.38\ 10^{1}$	0	0	$7.36\ 10^{1}$	$7.36\ 10^{1}$
Pyrophoric	0	0	0	$3.98\ 10^{0}$	$3.98\ 10^{0}$	$2.65\ 10^{0}$	0	0	$6.64\ 10^{0}$	$6.64\ 10^{0}$
Strong oxidising	0	0	0	$4.02\ 10^{-4}$	$4.02\ 10^{-4}$	0	0	0	$4.02\ 10^{-4}$	$4.02\ 10^{-4}$
Generating toxic gases	0	0	0	$4.02\ 10^{-4}$	$4.02\ 10^{-4}$	0	0	0	$4.02\ 10^{-4}$	$4.02\ 10^{-4}$
Water reactive	0	0	0	$1.08\ 10^{3}$	$1.08\ 10^{3}$	$2.55\ 10^{2}$	$1.48\ 10^{1}$	$7.26\ 10^{-1}$	$1.35\ 10^{3}$	$1.35\ 10^{3}$
Active particles	0	0	0	0	0	0	0	0	0	0
Soluble solids	0	0	0	0	0	0	0	0	0	0
Acrylamide	0	0	0	0	0	0	0	0	0	0
Benzene	0	$3.80\ 10^{-8}$	$3.80\ 10^{-8}$	$1.32\ 10^{-4}$	$1.32\ 10^{-4}$	$1.63\ 10^{-3}$	$5.49\ 10^{-4}$	0	$2.31\ 10^{-3}$	$2.31\ 10^{-3}$
Chlorinated solvents	0	0	0	0	0	0	0	0	0	0
Formaldehyde	0	0	0	0	0	0	0	0	0	0
Organometals	0	0	0	0	0	0	0	0	0	0

Materials	Mass (t)									
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward Vaults	Total vaults
Phenol	0	$3.75\ 10^{-6}$	$3.75\ 10^{-6}$	0	$3.75\ 10^{-6}$	0	0	0	0	$3.75\ 10^{-6}$
Styrene	0	0	0	0	0	0	0	0	0	0
Tri-butyl phosphate	0	$2.88\ 10^{-2}$	$2.88\ 10^{-2}$	$2.02\ 10^{-1}$	$2.30\ 10^{-1}$	$6.37\ 10^{-2}$	$3.22\ 10^{-3}$	$3.25\ 10^{-4}$	$2.69\ 10^{-1}$	$2.98\ 10^{-1}$
Other organophosphates	0	0	0	0	0	0	0	0	0	0
Vinyl chloride	$2.02\ 10^{-3}$	$4.80\ 10^{-1}$	$4.82\ 10^{-1}$	$1.27\ 10^{1}$	$1.32\ 10^{1}$	$1.20\ 10^{0}$	0	0	$1.39\ 10^{1}$	$1.44\ 10^{1}$
Arsenic	$9.75\ 10^{-9}$	$2.02\ 10^{-3}$	$2.02\ 10^{-3}$	$2.28\ 10^{-3}$	$4.29\ 10^{-3}$	$2.79\ 10^{-2}$	$9.42\ 10^{-3}$	0	$3.96\ 10^{-2}$	$4.16\ 10^{-2}$
Barium	0	0	0	0	0	0	0	0	0	0
Boron	$1.18\ 10^{1}$	$1.20\ 10^{1}$	$2.38\ 10^{1}$	$2.18\ 10^{1}$	$3.39\ 10^{1}$	$1.19\ 10^{2}$	$3.92\ 10^{1}$	0	$1.80\ 10^{2}$	$2.04\ 10^{2}$
Boron (not in Boral)	$1.17\ 10^{0}$	$1.19\ 10^{1}$	$1.31\ 10^{1}$	$1.07\ 10^{1}$	$2.27\ 10^{1}$	$1.13\ 10^{2}$	$3.81\ 10^{1}$	0	$1.62\ 10^{2}$	$1.75\ 10^{2}$
Boron (in Boral)	$1.06\ 10^{1}$	$7.78\ 10^{-2}$	$1.07\ 10^{1}$	$1.11\ 10^{1}$	$1.12\ 10^{1}$	$5.52\ 10^{0}$	$1.04\ 10^{0}$	0	$1.77\ 10^{1}$	$2.84\ 10^{1}$
Boral	$1.06\ 10^{2}$	$7.78\ 10^{-1}$	$1.07\ 10^{2}$	-	$7.78\ 10^{-1}$	-	-	-	0	$1.07\ 10^{2}$

Materials	Mass (t)									
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward Vaults	Total vaults
Cadmium	$3.63\ 10^{0}$	$1.45\ 10^{-4}$	$3.63\ 10^{0}$	$1.53\ 10^{0}$	$1.53\ 10^{0}$	$4.73\ 10^{-1}$	$1.40\ 10^{-2}$	0	$2.02\ 10^{0}$	$5.65\ 10^{0}$
Caesium	0	0	0	0	0	0	0	0	0	0
Selenium	0	$2.89\ 10^{-3}$	$2.89\ 10^{-3}$	$7.16\ 10^{-4}$	$3.60\ 10^{-3}$	$8.59\ 10^{-3}$	$2.90\ 10^{-3}$	0	$1.22\ 10^{-2}$	$1.51\ 10^{-2}$
Chromium	$3.42\ 10^{0}$	$4.15\ 10^{1}$	$4.50\ 10^{1}$	$3.55\ 10^{1}$	$7.70\ 10^{1}$	$1.13\ 10^{0}$	$3.66\ 10^{-1}$	0	$3.70\ 10^{1}$	$8.19\ 10^{1}$
Molybdenum	$9.86\ 10^{2}$	$1.82\ 10^{1}$	$1.00\ 10^{3}$	$5.15\ 10^{0}$	$2.34\ 10^{1}$	$5.06\ 10^{0}$	$1.16\ 10^{-1}$	0	$1.03\ 10^{1}$	$1.01\ 10^{3}$
Thallium	0	0	0	0	0	0	0	0	0	0
Tin	$2.08\ 10^{-2}$	$6.81\ 10^{-2}$	$8.88\ 10^{-2}$	$6.35\ 10^{0}$	$6.41\ 10^{0}$	$3.12\ 10^{0}$	$1.86\ 10^{-2}$	$3.62\ 10^{-3}$	$9.49\ 10^{0}$	$9.58\ 10^{0}$
Vanadium	$1.15\ 10^{0}$	$9.05\ 10^{0}$	$1.02\ 10^{1}$	$3.18\ 10^{-1}$	$9.36\ 10^{0}$	$7.25\ 10^{-3}$	0	0	$3.25\ 10^{-1}$	$1.05\ 10^{1}$
Mercury	0	$1.43\ 10^{-3}$	$1.43\ 10^{-3}$	-	$1.43\ 10^{-3}$	-	-	-	0	$1.43\ 10^{-3}$
Mercury compounds	0	0	0	$5.61\ 10^{-1}$	$5.61\ 10^{-1}$	$2.37\ 10^{-2}$	$8.06\ 10^{-3}$	$8.66\ 10^{-5}$	$5.92\ 10^{-1}$	$5.92\ 10^{-1}$
Thorium nitrate	0	$1.00\ 10^{-2}$	$1.00\ 10^{-2}$	-	$1.00\ 10^{-2}$	-	-	-	0	$1.00\ 10^{-2}$
Others hazard	0	0	0	$7.78\ 10^{0}$	$7.78\ 10^{0}$	$2.43\ 10^{-2}$	$8.21\ 10^{-3}$	0	$7.81\ 10^{0}$	$7.81\ 10^{0}$

Materials	Mass (t)									
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward Vaults	Total vaults
Electronic & electrical equipment (EEE)	$1.89\ 10^{1}$	$7.48\ 10^{1}$	$9.37\ 10^{1}$	$6.63\ 10^{1}$	$1.41\ 10^{2}$	$2.51\ 10^{0}$	0	0	$6.88\ 10^{1}$	$1.62\ 10^{2}$
EEE_Type1	$3.26\ 10^{0}$	$1.25\ 10^{1}$	$1.57\ 10^{1}$	$1.90\ 10^{1}$	$3.15\ 10^{1}$	$1.91\ 10^{0}$	0	0	$2.09\ 10^{1}$	$3.67\ 10^{1}$
EEE_Type2	$1.06\ 10^{1}$	$5.14\ 10^{1}$	$6.20\ 10^{1}$	$2.08\ 10^{1}$	$7.22\ 10^{1}$	$3.67\ 10^{-2}$	0	0	$2.08\ 10^{1}$	$8.28\ 10^{1}$
EEE_Type3	$4.99\ 10^{0}$	$1.10\ 10^{1}$	$1.60\ 10^{1}$	$1.94\ 10^{1}$	$3.04\ 10^{1}$	$5.59\ 10^{-1}$	0	0	$2.00\ 10^{1}$	$3.59\ 10^{1}$
EEE_Type4	0	$1.40\ 10^{-2}$	$1.40\ 10^{-2}$	$3.47\ 10^{0}$	$3.48\ 10^{0}$	0	0	0	$3.47\ 10^{0}$	$3.48\ 10^{0}$
EEE_Type5	0	$2.50\ 10^{-3}$	$2.50\ 10^{-3}$	$3.62\ 10^{0}$	$3.62\ 10^{0}$	0	0	0	$3.62\ 10^{0}$	$3.62\ 10^{0}$
Non-UKRWI materials (i.e. materials that have been reported in disposed data for which there is not a clear corresponding reporting line in UKRWI)										
Ion exchange materials	$8.35\ 10^{2}$	$7.27\ 10^{1}$	$9.08\ 10^{2}$	-	$7.27\ 10^{1}$	-	-	-	0	$9.08\ 10^{2}$
Others	$8.32\ 10^{1}$	$1.60\ 10^{1}$	$9.92\ 10^{1}$	-	$1.60\ 10^{1}$	-	-	-	0	$9.92\ 10^{1}$
Other inorganics	$1.25\ 10^{3}$	$4.13\ 10^{1}$	$1.29\ 10^{3}$	-	$4.13\ 10^{1}$	-	-	-	0	$1.29\ 10^{3}$
Unknown materials	$3.69\ 10^{3}$	$5.99\ 10^{2}$	$4.29\ 10^{3}$	-	$5.99\ 10^{2}$	-	-	-	0	$4.29\ 10^{3}$

Materials	Mass (t)									
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward Vaults	Total vaults
Barium carbonate	$1.00\ 10^{-5}$	$2.64\ 10^{-1}$	$2.64\ 10^{-1}$	-	$2.64\ 10^{-1}$	-	-	-	0	$2.64\ 10^{-1}$
Fibreglass	$5.41\ 10^{-1}$	$5.90\ 10^{0}$	$6.44\ 10^{0}$	-	$5.90\ 10^{0}$	-	-	-	0	$6.44\ 10^{0}$
Man made mineral fibres	$1.28\ 10^{1}$	$2.89\ 10^{1}$	$4.16\ 10^{1}$	-	$2.89\ 10^{1}$	-	-	-	0	$4.16\ 10^{1}$
Plasterboard	$1.20\ 10^{0}$	$8.24\ 10^{0}$	$9.44\ 10^{0}$	-	$8.24\ 10^{0}$	-	-	-	0	$9.44\ 10^{0}$
Rockwool	$3.07\ 10^{-1}$	$1.75\ 10^{1}$	$1.78\ 10^{1}$	-	$1.75\ 10^{1}$	-	-	-	0	$1.78\ 10^{1}$
Sludge	0	$2.13\ 10^{-3}$	$2.13\ 10^{-3}$	-	$2.13\ 10^{-3}$	-	-	-	0	$2.13\ 10^{-3}$
Aluminium oxide	$4.64\ 10^{-3}$	0	$4.64\ 10^{-3}$	-	0	-	-	-	0	$4.64\ 10^{-3}$
Chromates (in System 6 epoxy paint)	0	$8.00\ 10^{-3}$	$8.00\ 10^{-3}$	-	$8.00\ 10^{-3}$	-	-	-	0	$8.00\ 10^{-3}$
Cybutryne	$1.00\ 10^{-6}$	0	$1.00\ 10^{-6}$	-	0	-	-	-	0	$1.00\ 10^{-6}$
Detex	$1.40\ 10^{-2}$	0	$1.40\ 10^{-2}$	-	0	-	-	-	0	$1.40\ 10^{-2}$

Materials	Mass (t)									
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward Vaults	Total vaults
Magnesia (magnesium oxide)	0	$5.97\ 10^{-1}$	$5.97\ 10^{-1}$	-	$5.97\ 10^{-1}$	-	-	-	0	$5.97\ 10^{-1}$
Silicon sealant	$4.27\ 10^{-2}$	0	$4.27\ 10^{-2}$	-	0	-	-	-	0	$4.27\ 10^{-2}$
Additional/conditioning materials										
Estimated box puck metal (data to 31st March 2018 only)	$4.18\ 10^{3}$	$2.34\ 10^{3}$	$6.52\ 10^{3}$	-	$2.34\ 10^{3}$	-	-	-	0	$6.52\ 10^{3}$
Estimated drum puck metal (data to 31st March 2018 only)	$2.65\ 10^{3}$	$3.51\ 10^{2}$	$3.00\ 10^{3}$	-	$3.51\ 10^{2}$	-	-	-	0	$3.00\ 10^{3}$
Absorbant block	$1.17\ 10^{2}$	$2.41\ 10^{1}$	$1.42\ 10^{2}$	-	$2.41\ 10^{1}$	-	-	-	0	$1.42\ 10^{2}$
Conditioning glass	0	0	0	0	0	0	0	0	0	0
Conditioning grout	$1.66\ 10^{5}$	$3.38\ 10^{4}$	$2.00\ 10^{5}$	$1.44\ 10^{5}$	$1.77\ 10^{5}$	$1.32\ 10^{5}$	$9.08\ 10^{4}$	$4.39\ 10^{4}$	$4.10\ 10^{5}$	$6.10\ 10^{5}$

Materials	Mass (t)									
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward Vaults	Total vaults
Container void fill sand	-	-	0	0	0	0	0	0	0	0
Conditioning polymer	-	-	0	0	0	0	0	0	0	0
Conditioning metal	0	0	0	0	0	0	0	0	0	0
Container/package materials										
Paint	$8.50\ 10^{-2}$	0	$8.50\ 10^{-2}$	0	0	0	0	0	0	$8.50\ 10^{-2}$
Noxyde paint	$3.74\ 10^{-1}$	0	$3.74\ 10^{-1}$	0	0	0	0	0	0	$3.74\ 10^{-1}$
Metal plates TRS	$2.95\ 10^{1}$	0	$2.95\ 10^{1}$	0	0	0	0	0	0	$2.95\ 10^{1}$
Container metal	$3.17\ 10^{4}$	$6.08\ 10^{3}$	$3.77\ 10^{4}$	-	$6.08\ 10^{3}$	-	-	-	0	$3.77\ 10^{4}$
Container mild steel	0	0	0	$2.87\ 10^{4}$	$2.87\ 10^{4}$	$3.35\ 10^{4}$	$2.65\ 10^{4}$	$8.62\ 10^{3}$	$9.73\ 10^{4}$	$9.73\ 10^{4}$
Container stainless Ssteel	0	0	0	0	0	0	0	0	0	0
Container concrete	0	0	0	0	0	0	0	0	0	0

Materials	Mass (t)									
	Vault 8	Disposed Vault 9 and 9a	Total disposed vaults	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward Vaults	Total vaults
Container cast iron	0	0	0	0	0	0	0	0	0	0
Container cast iron and lead	0	0	0	0	0	0	0	0	0	0
Container stainless steel and concrete	0	0	0	0	0	0	0	0	0	0
Container metal and concrete	0	0	0	0	0	0	0	0	0	0
Other container materials	0	0	0	0	0	0	0	0	0	0

B4 C-14 in Materials

Table B.4: The activity of C-14 associated with materials in the Stage 3 Reference Forward Inventory. Tiered material groups are given in bold, which consist of the sum of the materials given in italic beneath them. Materials with no associated C-14 activity reported are not included

Waste materials	C-14 activity (TBq)				
	Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward Vaults
Metals					
Ferrous stainless steel	$3.79\ 10^{-2}$	$7.92\ 10^{0}$	$2.16\ 10^{0}$	$5.84\ 10^{0}$	$1.60\ 10^{1}$
Ferrous excluding stainless steel	$3.63\ 10^{0}$	$4.27\ 10^{1}$	$1.80\ 10^{1}$	$8.95\ 10^{0}$	$7.33\ 10^{1}$
Iron	$1.00\ 10^{-3}$	$5.13\ 10^{-7}$	0	0	$1.00\ 10^{-3}$
Aluminium	$6.75\ 10^{-7}$	$1.28\ 10^{-6}$	0	0	$1.96\ 10^{-6}$
Copper	$2.70\ 10^{-7}$	$5.13\ 10^{-7}$	0	0	$7.83\ 10^{-7}$
Nickel	$2.70\ 10^{-7}$	$5.13\ 10^{-7}$	0	0	$7.83\ 10^{-7}$
Uranium	$2.70\ 10^{-7}$	$5.13\ 10^{-7}$	0	0	$7.83\ 10^{-7}$

Waste materials	C-14 activity (TBq)				
	Vault 9 and 9a	**Vault 10**	**Vault 11**	**Vault 12**	**Total Forward Vaults**
Other materials (Group defined in UKRWI.)					
Inorganic sludge & flocs	$6.51\ 10^{-2}$	$5.63\ 10^{-2}$	$1.06\ 10^{-2}$	0	$1.32\ 10^{-1}$
Graphite	$5.88\ 10^{0}$	$1.59\ 10^{1}$	$9.53\ 10^{-1}$	$3.82\ 10^{-1}$	$2.31\ 10^{1}$
Cement/concrete	$1.05\ 10^{-1}$	$5.15\ 10^{-3}$	$6.29\ 10^{-4}$	$1.30\ 10^{-4}$	$1.11\ 10^{-1}$
Glass/ceramics	$2.70\ 10^{-7}$	$5.13\ 10^{-7}$	0	0	$7.83\ 10^{-7}$
Organics					
Cellulosics	$1.18\ 10^{-5}$	$6.58\ 10^{-6}$	0	0	$1.84\ 10^{-5}$
Paper	$5.46\ 10^{-6}$	$3.24\ 10^{-6}$	0	0	$8.70\ 10^{-6}$
Wood	$6.34\ 10^{-6}$	$3.34\ 10^{-6}$	0	0	$9.68\ 10^{-6}$
Ion exchange resins	$1.06\ 10^{0}$	$4.90\ 10^{-1}$	0	0	$1.55\ 10^{0}$
Total rubber	$1.35\ 10^{-7}$	$2.56\ 10^{-7}$	0	0	$3.91\ 10^{-7}$
Halogenated rubber	0	0	0	0	0

Waste materials	C-14 activity (TBq)				
	Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward Vaults
Non-halogenated rubber	$1.35\ 10^{-7}$	$2.56\ 10^{-7}$	0	0	$3.91\ 10^{-7}$
Other organics	$2.55\ 10^{-9}$	$6.29\ 10^{-9}$	0	0	$8.83\ 10^{-9}$
Not declared					
Not declared	$9.64\ 10^{0}$	$8.72\ 10^{0}$	$9.61\ 10^{-1}$	$2.73\ 10^{-1}$	$1.96\ 10^{1}$

B5 Container numbers

Table B.5: Container numbers in the vaults for the Stage 3 Reference Inventory

Container Types	Number of containers									
	Vault 8	Disposed Vault 9 and 9a	Total disposed	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward	Total
Windscale Advanced Gas Reactor (WAGR) Box	74	11	85	-	11	-	-	-	0	85
Treated Radwaste Store (TRS) Drums	1068	0	1068	-	0	-	-	-	0	1068
1/3 Height IP-2 ISO (TC03)	393	144	537	10	154	34	6	0	50	587
2/3 Height IP-2 ISO (TC06)	16	1	17	0	1	0	0	0	0	17
1/2 Height Waste Monitoring and Compaction (WAMAC) IP-2 ISO (TC08)	343	132	475	339	471	396	118	4	856	1331
1/2 Height Waste Monitoring and Compaction (WAMAC) IP-2 ISO (Package type other than TC08)	1941	703	2644	-	703	-	-	-	0	2644

Container Types	Number of containers									
	Vault 8	**Disposed Vault 9 and 9a**	**Total disposed**	**Forward Vault 9 and 9a**	**Total Vault 9 and 9a**	**Vault 10**	**Vault 11**	**Vault 12**	**Total Forward**	**Total**
1/2 Height IP-2 Disposal/Re-usable ISO (TC01/TC02)	5217	999	6216	7150	8149	5437	3449	2228	18265	24481
1/2 Height ISO (Package type other than TC01/TC02)	1343	7	1350	-	7	-	-	-	0	1350
3/4 Height ISO Container	4	4	8	-	4	-	-	-	0	8
Full Height ISO Container	495	5	500	-	5	-	-	-	0	500
Other Container or Non-Standard Item	318	0	318	-	0	-	-	-	0	318
Standard Transport Waste Container (SWTC)-Compatible Strong Container	0	0	0	3231	3231	9592	9676	1079	23578	23578
Total packages	11212	2006	13218	10730	12736	15458	13250	3311	42748	55966

B6 Non-radiological contaminants

Table B.6: A summary of the masses of selected non-radiological contaminants in the vaults for the Stage 3 Reference Inventory. Tiered material groups are given in bold, which consist of the sum of the materials given in italic beneath them[5]

Materials	Mass (t)									
	Vault 8	Disposed Vault 9 and 9a	Total disposed	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward	Total
Arsenic	$9.75\ 10^{-9}$	$2.02\ 10^{-3}$	$2.02\ 10^{-3}$	$2.28\ 10^{-3}$	$4.29\ 10^{-3}$	$2.79\ 10^{-2}$	$9.42\ 10^{-3}$	0	$3.96\ 10^{-2}$	$4.16\ 10^{-2}$
Asphalt tarmac (cont. coal tar)	$5.56\ 10^{1}$	$2.92\ 10^{2}$	$3.47\ 10^{2}$	$7.2\ 10^{1}$	$3.64\ 10^{2}$	$3.66\ 10^{1}$	$1.06\ 10^{1}$	$3.26\ 10^{-1}$	$1.19\ 10^{2}$	$4.67\ 10^{2}$
Beryllium	$3.98\ 10^{-1}$	$6.80\ 10^{-2}$	$4.66\ 10^{-1}$	$8.98\ 10^{0}$	$9.05\ 10^{0}$	$5.41\ 10^{0}$	$2.61\ 10^{-3}$	0	$1.44\ 10^{1}$	$1.49\ 10^{1}$
Boron	$1.18\ 10^{1}$	$1.20\ 10^{1}$	$2.38\ 10^{1}$	$2.18\ 10^{1}$	$3.39\ 10^{1}$	$1.19\ 10^{2}$	$3.92\ 10^{1}$	0	$1.80\ 10^{2}$	$2.04\ 10^{2}$
Boron non-Boral	$1.17\ 10^{0}$	$1.19\ 10^{1}$	$1.31\ 10^{1}$	$1.07\ 10^{1}$	$2.27\ 10^{1}$	$1.13\ 10^{2}$	$3.81\ 10^{1}$	0	$1.62\ 10^{2}$	$1.75\ 10^{2}$
Boron Boral	$1.06\ 10^{1}$	$7.78\ 10^{-2}$	$1.07\ 10^{1}$	$1.11\ 10^{1}$	$1.12\ 10^{1}$	$5.52\ 10^{0}$	$1.04\ 10^{0}$	0	$1.77\ 10^{1}$	$2.84\ 10^{1}$

[5] Data presented here are for the Stage 3 inventory. We have not attempted to further derive estimates of non-radiological inventory beyond what has been reported. The HRA uses material data provided in the Stage 2 Reference Inventory and applies assumptions on the composition of contaminants in each material.

Materials	Mass (t)									
	Vault 8	Disposed Vault 9 and 9a	Total disposed	Forward Vault 9 and 9a	Total Vault 9 and 9a	Vault 10	Vault 11	Vault 12	Total Forward	Total
Cadmium	$3.63\ 10^{0}$	$1.45\ 10^{-4}$	$3.63\ 10^{0}$	$1.53\ 10^{0}$	$1.53\ 10^{0}$	$4.73\ 10^{-1}$	$1.40\ 10^{-2}$	0	$2.02\ 10^{0}$	$5.65\ 10^{0}$
Lead	$4.08\ 10^{3}$	$2.68\ 10^{2}$	$4.35\ 10^{3}$	$1.06\ 10^{3}$	$1.33\ 10^{3}$	$4.57\ 10^{3}$	$5.93\ 10^{2}$	$6.51\ 10^{0}$	$6.22\ 10^{3}$	$1.06\ 10^{4}$
Selenium	0	$2.89\ 10^{-3}$	$2.89\ 10^{-3}$	$7.16\ 10^{-4}$	$3.60\ 10^{-3}$	$8.59\ 10^{-3}$	$2.90\ 10^{-3}$	0	$1.22\ 10^{-2}$	$1.51\ 10^{-2}$
Tri-butyl phosphate	0	$2.88\ 10^{-2}$	$2.88\ 10^{-2}$	$2.02\ 10^{-1}$	$2.30\ 10^{-1}$	$6.37\ 10^{-2}$	$3.22\ 10^{-3}$	$3.25\ 10^{-4}$	$2.69\ 10^{-1}$	$2.98\ 10^{-1}$

B7 Fill Dates

Table B.7: Expected vault fill dates for the Stage 3 Reference Forward Inventory (LLW and ILW) based on the UKRWI arisings profiles

Vault	Year for first waste emplacement (FY beginning)	Year of final waste emplacement (FY beginning)	Percent filled
9	2008	2039	100%
10	2039	2084	100%
11	2084	2113	100%
12	2113	2135	41%

Nuclear Waste Services Limited

Pelham House

Pelham Drive

Calderbridge

Cumbria CA20 1DB

UK

t +44 (0)300 369 0000

w www.nuclearwasteservices.uk

Nuclear Waste Services

Where to find more information

You can find out more about NWS online or by contacting us directly.

About our organisation:
nuclearwasteservices.uk/about-us

You can subscribe for e-mail updates:
public.govdelivery.com/accounts/UKNDA/signup/42429

NWS Helpdesk

0300 369 0000

info@nuclearwasteservices.uk

Freepost NUCLEAR WASTE SERVICES

Follow us:

Nuclear Waste Services

@NuclearWasteServices

@nuclear_waste_services

Nuclear Waste Services

Nuclear Waste Services Limited (Company Registration No 05608448) is registered in England and Wales with the registered office located at Pelham House, Pelham Drive, Calderbridge, Seascale, CA20 1DB.

Part of the NDA group