Pre-Submission Draft Kent Minerals and Waste Local Plan 2024-39

Regulation 19 Publication

Radioactive Waste Topic Paper

January 2024

This topic paper is based on 'Waste Topic Report 6' that was published in January 2013 to support the Kent Minerals and Waste Local Plan 2013-30.

Contents

Abbreviations

ALARA	As Low as Reasonably Achievable
BAT	Best Available Techniques
BEIS	Department for Business Energy and Industrial Strategy
DECC	Department of Energy and Climate Change
DEFRA	Department for Environment, Food and Rural Affairs
DESNZ	Department for Energy Security and Net Zero
EA	Environment Agency
ESC	Environmental Safety Case
EU	European Union
GDF	Geological Disposal Facility
GRR	Guidance on Requirements for Release from Radioactive Substances Regulation
HAW	High Activity Waste. This includes HLW, ILW and some LLW that cannot be disposed of via any route other than deep geological disposal.
HLW	High Level Waste. This is waste above the upper limit of LLW which requires its heat-generating properties to be taken into account in its storage and disposal.
HSE	Health and Safety Executive
ILW	Intermediate Level Waste. This is waste above the upper limit of LLW which does not require its heat-generating properties to be taken into account in its storage and disposal.
IROPI	Imperative reasons of overriding public interest
ISF	Interim Storage Facility
KMWLP	Kent Minerals and Waste Local Plan
LLW	Low Level Waste
LLWR	Low Level Waste Repository
NDA	Nuclear Decommissioning Agency
NE	Natural England
NPS	National Policy Statement
NSD	Near Surface Disposal
ONR	Office for Nuclear Regulation
PPG	Planning Practice Guidance

RSR	Radioactive Substances Regulation
RWM	Radioactive Waste Management
SAC	Special Area of Conservation
SLC	Site Licence Company
SPA	Special Protection Area
SSA	Strategic Siting Assessment
SSSI	Site of Special Scientific Interest
SWESC	Site Wide Environmental Safety Case
UKRWI	United Kingdom Radioactive Waste and Material Inventory
VLLW	Very Low Level Wastes
WFD	Waste Framework Directive
WMP	Waste Management Plan

1 Introduction

1.0.1 This topic paper on radioactive waste sets out relevant legislation (Appendix 1), policy and strategy applicable to the management of radioactive waste at a national and local level. This paper examines existing and potential future waste arisings and the implications of the storage, management and disposal of radioactive waste and so informs the Pre-Submission Draft Kent Minerals and Waste Local Plan (KMWLP) (2024-39) .

1.0.2 Radioactive wastes are produced in the UK as a result of:

- The generation of electricity in nuclear power stations and from the associated production and processing of the nuclear fuel;
- the use of radioactive materials in industry, medicine and research; and,
- from military nuclear programmes.

1.0.3 The main organisations involved in these activities of relevance to Kent are described in Appendix 2, and key terminology is explained in Appendix 3. The nuclear installations at Dungeness A and Dungeness B are the most significant nuclear sites within Kent, and the main producers of radioactive waste. These sites are operated by Nuclear Restoration Services (NRS) (known as Magnox Ltd prior to 31 October 2023) and EDF respectively.

1.0.4 This topic paper takes into account policy, guidance and other evidence, including the following:

- The Government's National Policy Statement (NPS) for Nuclear Power Generation (EN-6) (July 2011)[1];
- Department of Energy & Climate Change (DECC), Scottish Government, Welsh Government and the Department of the Environment strategies for the management of solid low level radioactive waste from the non-nuclear industry in the United Kingdom, Part 1 – Anthropogenic radionuclides (March 2012)[2] and UK strategy for the management of solid low level radioactive waste from the non-nuclear industry (February 2016)[3];
- The National Planning Policy for Waste (October 2014) and Planning Practice Guidance;
- Management of radioactive waste from decommissioning of nuclear sites: Guidance on Requirements for Release from Radioactive Substances Regulation (July 2018) (GRR);
- Implementing Geological Disposal – working with communities: long term management of higher activity radioactive waste (December 2018);
- Radioactive Waste Strategy, NDA, September 2019;
- The latest NDA Decommissioning Authority Strategy, effective from March 2021;
- The 2022 Dungeness A Site Environmental Management Plan - Issue 17 (October 2022);
- Kent County Council Note on the Statement of Common Ground between KCC and Magnox/NDA, December 2021 in respect of the Kent Minerals and Waste Local Plan;
- Responses to the Regulation 18 consultations on an updated KMWLP in February 2022 and October 2022, including those made by Magnox/NDA, EDF and the Environment Agency; and
- KCC Habitats Regulation Assessment – Update to the Kent Minerals and Waste Local Plan (2024-39), January 2024.

[1] The government is developing a new nuclear NPS which will cover the deployment of new nuclear power stations beyond 2025. This new NPS will take into account the changes in the nuclear landscape since the current NPS was published in 2011. The government intends to designate this NPS by early 2025.
[2] DECC report (publishing.service.gov.uk)
[3] https://assets.publishing.service.gov.uk/media/5a8087a3ed915d74e622efc0/NI_LLW_Strategy_Final.pdf

2 National Policy

2.0.1 This section of the topic paper discusses relevant National Policies applicable to land use planning matters and the management of radioactive waste.

2.1 National Planning Policy for Waste and Planning Practice Guidance.

2.1.1 Radioactive waste is not explicitly addressed in the National Planning Policy for Waste 2014[4]. In addition, the latest replacement Waste Management Plan (WMP) for England produced by DEFRA in 2021 does not cover radioactive waste[5]. Despite this, the management of radioactive waste is a highly complex and heavily regulated subject with a number of governmental and commercial organisations involved.

2.1.2 The Planning Practice Guidance (PPG) confirms that the planning system controls the development and use of land in the public interest. This includes consideration of the impacts on the local environment and amenity taking into account the criteria set out in Appendix B of the National Planning Policy for Waste.

2.1.3 The PPG also confirms that a number of planning issues are also covered by other regulatory regimes and that planning authorities should assume that these regimes will operate effectively. The PPG recognises that the focus of the planning system should be on whether the development itself is an acceptable use of the land and the impacts of those uses, rather than any control processes, health and safety issues or emissions themselves where these are subject to approval under other regimes. However, before granting planning permission authorities will need to be satisfied that these issues can or will be adequately addressed by taking the advice from the relevant regulatory body.

2.2 Nuclear Decommissioning Authority (NDA) Strategy

2.2.1 The NDA Strategy is required by the Energy Act (2004) to be reviewed and published every five years. The UK Government and the Scottish Ministers approved the latest NDA Strategy in March 2021[6]. The strategy sets out how the NDA will manage waste in an integrated manner and considers 'how we manage all forms of waste arising from operating and decommissioning our sites including waste retrieved from legacy facilities'. A summary of the latest NDA Strategy is given in Appendix 4.

2.2.2 The examination of Somerset County Council's waste plan confirmed that the then extant NDA Strategy[7] should be considered as part of the national policy framework for waste management. The report prepared by the planning inspector conducting the independent examination of Somerset County Council's Waste Core Strategy stated, in relation to the policy on radioactive waste management[8], that: "*Government sets high level policy which is implemented by the NDA*", and, "*the question to answer then is whether or not NDA strategies are national policy for the purposes of s20(5) of the 2004 Act[9] which refers back to s19 and, in this regard, s19(2)(a) in particular. Having regard to the guidance in PPS10, Planning for Sustainable Waste Management[10], my view is that they are*". It is clear, then, that it is necessary for the Kent Minerals and Waste Local Plan to consider and address the requirements within NDA strategy documents.

[4] DLUHC & MHCLG (2014) National Planning Policy for Waste.
[5] DEFRA (2021) Waste Management Plan for England 2021 – see Waste Management Plan for England (publishing.service.gov.uk)
[6] NDA (2021). Strategy Effective from March 2021
[7] Although the inspector was considering the NDA strategy in place at that time, this position is considered to remain relevant.
[8] Note Prepared by the Appointed Inspector at the request of the County Council,1st August 2012, paragraphs 10-12
[9] 2004 Planning and Compulsory Purchase Act
[10] PPS 10 was replaced by the National Planning Policy for Waste

2.2.3 The latest NDA Strategy confirms that decommissioning and site restoration is based on the principles of optimisation and proportionality, which guide the priority, pace and target of decommissioning and remediation for each facility or site. Identifying the preferred approach to decommissioning and remediation requires that the benefits and detriments of different options are balanced to deliver the greatest net benefit. This optimisation process considers stakeholder views on a range of factors and is intended to enable transparent identification of sustainable solutions.

2.2.4 Applying these principles will ensure that materials, waste and contamination associated with decommissioning and site restoration at nuclear licensed sites are managed in a way that is safe, but the optimised solution may not necessarily lead to all of them being removed from the site. It may also mean the use of shared facilities for the treatment and storage of radioactive wastes.

2.2.5 The NDA published its Radioactive Waste Strategy in September 2019[11] following a public consultation. This single radioactive waste strategy replaced the previous NDA strategy for Higher Activity Waste (HAW) and is consistent with the UK Strategy for the Management of Solid Low Level Radioactive Waste from the Nuclear Industry 2007. Note that the term Higher Activity Waste includes High Level Waste (HLW), Intermediate Level Waste (ILW) and some Low Level Waste (LLW) (see Appendix 3).

2.2.6 The NDA Radioactive Waste Strategy includes the following objectives:

- Drive application of the waste hierarchy where it is practicable and appropriate to do so;
- provide a robust and sustainable infrastructure, making best use of existing waste management assets and developing new waste management routes as required;
- enable risk-informed waste management with greater emphasis placed on the nature and properties of the waste rather than classification as LLW or ILW etc.

2.3 2023 Consultation on UK Policy proposals for Managing Radioactive Substances and Nuclear Decommissioning[12]

2.3.1 In 2023 the UK Government published a consultation on some proposed changes to policies on nuclear decommissioning and managing solid radioactive waste, including disposal. These include proposals to:

- Require those responsible for creating and managing solid radioactive waste to apply a risk-informed approach as a decision-making framework for managing all solid radioactive waste[13];
- require the application of the waste hierarchy for managing all categories of solid radioactive waste to ensure that the creation of radioactive waste is prevented or minimised[14];
- develop a new policy framework for near surface disposal facilities for less hazardous ILW in England and Wales;
- to allow disposal of intermediate level waste in near surface facilities by amending UK Government and the devolved administrations' policies on the disposal of higher activity radioactive waste; and
- amend the UK Government's and devolved administrations' policy on managing solid LLW to promote on-site disposal on nuclear and former nuclear sites where it is safe and appropriate to do so.

[11] Radioactive Waste Strategy, NDA, September 2019
[12] Managing radioactive substances and nuclear decommissioning consultation, DESNZ, March 2023
[13] Current policies on the management of higher activity radioactive waste in England and Wales are based principally on the waste's radioactivity classification.
[14] Application of the waste hierarchy is already a requirement in the policy for the management of LLW in the UK, and for the management of higher activity radioactive waste in Scotland.

2.3.2 In addition, the proposed policy update sets out the Government expectations that:

- The land on which publicly owned nuclear facilities are located is recognised as a key strategic asset and should be considered first for the location of national infrastructure;
- any new facility covered by the updated policy, including treatment and storage facilities, should be designed, built and operated so as to minimise the complexity of subsequent decommissioning and associated waste management operations;
- environmental impacts and greenhouse gas emissions should be minimised through, among other things, consideration of reuse or recycling materials and assets wherever possible before they become waste; and
- the wider socio-economic and environmental benefits of decommissioning and clean-up should be maximised.

A more complete summary of proposed UK Government policy changes is given in Appendix 5.

2.4 National Policy Statement: Nuclear Power Generation (EN-6)

2.4.1 In June 2011 the Government published the National Policy Statement: Nuclear Power Generation (EN-6)[15] which confirmed that Dungeness is not considered suitable for nuclear power generation. This is because the Government considered that developing the site would adversely affect the Dungeness Special Area of Conservation (SAC), protected under the European Habitats Directive. The case for not allocating Dungeness C also argued that as part of any development at the power station, the movement of additional shingle would be required to replenish its flood defences which could have adverse effects on habitats elsewhere on the Dungeness SAC.

2.4.2 On 22 November 2023, the Department for Energy Security and Net Zero (DESNZ) published five updated National Policy Statements on energy infrastructure but this did not include an update to EN-6. The Government's 2022 Energy Security Strategy[16] builds upon the Government's White Paper on Nuclear Power by confirming the continuation of 'investing massively in nuclear power'. In the Nuclear section of the Energy Security Strategy, it continues to state how the 'UK is making the big call to reverse decades of underinvestment'.

2.4.3 Subsequently, the Government has confirmed that "*to reflect the changing technological and policy landscape, and to support the transition to net zero, the Government will develop a new national policy statement…for nuclear energy infrastructure deployable after 2025*". This is expected to reflect the reduced land requirement for small modular reactors opening the opportunity for Dungeness to be reconsidered for hosting new nuclear power generation.

2.4.4 At the time of the adoption of the Kent Minerals and Waste Local Plan in 2016, KCC, Folkestone and Hythe District Council (as Shepway District Council at that time) and the local communities on the Romney Marsh supported the principle of a new nuclear power station at Dungeness. In a statement released in January 2023, Kent County Council and the then Shepway Folkestone & Hythe District Council reaffirmed their commitment to "*secure a nuclear future for Dungeness [and to] work with Government to ensure Dungeness is included in the new list of national nuclear sites following planned consultation*."

2.4.5 Although there are currently no plans for the construction of Dungeness C, the reduced land requirements of small modular reactors means that Dungeness again has the potential to site further nuclear power generation; it is therefore essential that the Kent MWLP policy on nuclear waste is sufficiently flexible to embrace the possibility of new nuclear waste issues that may arise if nuclear development is constructed and operates during the plan period (up to 2039).

[15] National Policy Statement: Nuclear Power Generation (EN-6)
[16] BEIS (2022) Policy Paper: British Energy Security Strategy: see quotation within 'introduction' section: British energy security strategy - GOV.UK (www.gov.uk)

2.4.6 A new nuclear power station in Kent would increase the amount of radioactive waste to be managed in Kent, and potentially increase local ILW and potentially HLW storage requirements. That said, such developments may be beyond the period of the Kent Minerals and Waste Local Plan (KMWLP) (2024-39).

2.5 Planning Guidance for on-site disposal of 'low level' and 'very low level' radioactive waste on nuclear and decommissioned sites

2.5.1 The government has previously signalled its intention to publish guidance relating to planning matters concerning the on-site disposal of suitable 'low level' and 'very low level' radioactive waste on nuclear and decommissioned sites, however this has not been published and its timescale for publication is uncertain.

3 Radioactive Waste in the UK

3.0.1 The latest UK Radioactive Waste and Material Inventory (UKRWI) was published by BEIS and the NDA in 2023[17]. The 2022 UKRWI lists the major sources of current and future radioactive waste arisings. Apart from Dungeness A and B power stations, there are no other major radioactive waste sources identified in Kent as shown in Figure 1.

[17] UK Radioactive Waste and Material Inventory 2022 - GOV.UK (www.gov.uk)

Figure 1: Major waste producing sites and waste disposal facilities in the 2022 UK Radioactive Waste Inventory displaying that Dungeness A and B are the only radioactive waste sources identified.

3.0.2 The total volume of the different types of radioactive wastes that exist today and is forecast over the next century from existing facilities is about 4.5 million cubic metres (Table 1). This volume would fill Wembley Stadium four times over and the equivalent weight is about five million tonnes.

3.0.3 Table 1 gives total reported waste volumes and corresponding masses, and total package waste volumes and corresponding numbers of packages, for each waste category existing at 1 April 2022 including future arisings[18,19, 20].

Table 1: Total waste quantities at 1 April 2022 including future arisings

Waste Category	Reported volume (m^3)	Reported mass (tonnes)	Packaged volume (m^3)	Number of packages
HLW(1)	1,670	3,500	1,470	7,520
ILW	249,000	310,000	496,000	282,000
LLW	1,580,000(2)	2,000,000	1,340,000	19,900(3)
VLLW	2,750,000(4)	2,800,000	2,610,000	See Note 5
Total	4,580,000	5,100,000	4,450,000	310,000

(1) The volume and mass do not include waste from reprocessing overseas spent fuel that will be exported to the country of origin and assume substitution arrangements are implemented.
(2) LLW includes 323,000 reported volumes of mixed LLW/Very Low Level Waste (VLLW) at Springfields.
(3) Includes only those wastes packaged for disposal at the Low Level Waste Repository (LLWR) on-site and Dounreay LLW values (packed volume 390,000 m^3). Excludes LLW streams and component parts of LLW streams whose characteristics make them suitable for recycling, incineration or appropriately permitted landfill disposal.
(4) Includes 2,650,000 m^3 reported volume from facility decommissioning at Sellafield. However, the current best estimate albeit based on limited decommissioning experience, is that 70% of this material may be 'out of scope' of regulatory control.
(5) As VLLW can be disposed to appropriately permitted landfill sites no package numbers are collated for this waste category.

3.0.4 About 94% of all radioactive waste, by volume, falls into the LLW category (VLLW is a sub-category of LLW). Of this, 4 million cubic metres comes from the dismantling and demolition of nuclear facilities and the clearance of contaminated ground at nuclear sites. About 6% of all wastes in the UKRWI is in the ILW category and less than 0.1% is in the HLW category (none of which is present at Dungeness A or Dungeness B sites). The proportion of waste within each category will change over time as the radioactivity of the waste decays.

3.0.5 ILW can range from radioactive waste that is very similar in nature and properties to LLW to very hazardous radioactive waste, which needs the greater degree of isolation and containment that a deep Geological Disposal Facility (GDF) provides. Work undertaken by the NDA has demonstrated that a proportion of the ILW that will be generated during decommissioning does not require the level of isolation and containment provided by a GDF and may be safely disposed of in a near surface facility[21]. As such Government is currently consulting (Appendix 5) on the option for suitable ILW to be disposed of via Near Surface Disposal (NSD)[22]. Any NSD facility for ILW will be subject to the usual local planning requirements under the Town and Country Planning Act 1990. Before selecting a site, the NDA would engage with representatives from local communities in areas that may be suitable. The current Government consultation does not propose to make a NSD facility a Nationally Significant Infrastructure Project and so any planning application would be determined by the local waste planning authority.

[18] Radioactively contaminated land and subsurface structures at certain sites have not been included in the UKRWI where clean-up plans have not been confirmed and there is significant uncertainty over the management route and waste quantities.
[19] Most radioactive waste produced by minor waste producers is not reported in the UK Inventory as it is either low volumes of LLW that can be disposed of by 'controlled burial' at landfill sites or low volume VLLW that can be disposed of with municipal, commercial and industrial wastes at landfill sites.
[20] Future arisings relate to that anticipated from the decommissioning of existing infrastructure
[21] Nuclear Decommissioning Authority (NDA) (2020). Near surface disposal strategic position paper. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/910184/NSD_StrategicPositionPaper_August_2020_FINAL_V2.pd
22 Managing radioactive substances and nuclear decommissioning - GOV.UK (www.gov.uk)

4 Radioactive Waste in Kent

4.0 Dungeness A and B

4.0.1 Kent has two disused nuclear power stations (Dungeness A and B) located on Romney Marsh (Figure 3). Dungeness A station (a twin reactor Magnox power station) operated from 1965 and generated electrically until 31 December 2006. Dungeness A is now undergoing decommissioning. During decommissioning the fuel, plant and buildings associated with electricity generation is systematically removed. Prior to the decommissioning work commencing, the site licensee[23] was legally required to seek consent from the Health and Safety Executive (HSE) to carry out the decommissioning work.

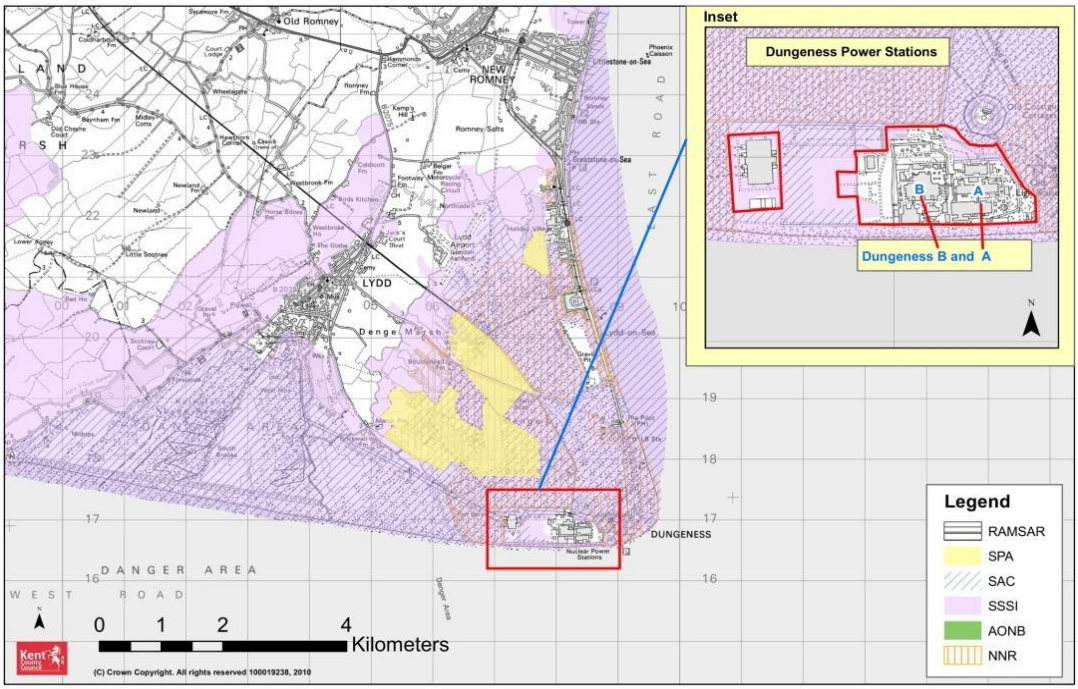

Figure 3 - Dungeness & Romney Marsh

4.0.2 Table 2 below is from the 2022 UKRWI[24] and shows the waste volumes of radioactive waste at Dungeness A and B sites:

[23] The licensee for Dungeness A was Magnox Electric Ltd prior to the commencement of the decommissioning work, the licence was transferred to Magnox South Ltd in October 2008 and then to Magnox Ltd in 2011

[24] Source: Pg 56 and pg 58 of 2022-Detailed-Data-Report-010223.pdf (nda.gov.uk)

Table 2: Radioactive Waste at Dungeness A and B Stations at 1 April 2022

	Reported volume (m^3) at 1 April 2022	Number of packages when all wastes and future arisings are packaged	Packaged volume (m^3) at 1 April 2022 and future arisings	Reported volume (m^3) at 1 April 2022 and future arisings
Dungeness A LLW	319	75	31,900	34,200
Dungeness A ILW (1) (2)	305	452	5,590	4,350
Dungeness B LLW	79	341	6,690	16,000
Dungeness B ILW (2)	581	587	6,060	3,250
Total	**1,284**	**1,455**	**50,240**	**57,800**

(1) 41.8 m^3 reported volume (147 m^3 packaged volume; 112 packages) are stored at Bradwell
(2) Some packaged ILW will be disposed of as LLW

4.0.3 In 2023 the UK Government s consulted (Appendix 5) on a proposal for the UK to adopt a policy enabling on-site disposal of some low-level radioactive wastes present on nuclear sites such as Dungeness A and Dungeness B. On-site disposal can take a number of forms, but chiefly concerns leaving sub-surface radioactively contaminated (mainly concrete) structures in place indefinitely and filling unwanted below-ground voids with site-derived radioactively contaminated demolition arisings (mainly concrete and masonry), under a permit granted by the relevant environment agency in accordance with the requirements of the Guidance on the Requirements for Release from radioactive substances regulation (GRR)[25]. See also the Environment Agency comments concerning this issue in Appendix 6.

4.0.4 Current waste management routes for radioactive wastes from the Dungeness sites are varied and include some LLW being sent off-site for incineration and some to metal recycling facilities. Such approaches help ensure that the quantity of waste needing disposal at the Low Level Waste Repository (LLWR) in Sellafield, Cumberland is greatly reduced. In addition to these waste management routes, some LLW is decontaminated prior to disposal as a lower category of radioactive waste (or as non-radioactive metal).

4.0.5 ILW is being, and will continue to be, produced during the decommissioning of Dungeness A and B stations. There is no High Level Waste (HLW) at Dungeness A, and there is, and will be, no HLW at Dungeness B. Note that strictly speaking, though spent fuel may require its heat-generating properties to be taken into account in its storage, it is not classified as a waste.

4.0.6 Currently the principal management strategy for "operational" ILW (meaning that stored in vaults and tanks etc.) is for it to be packaged with the intention to eventually dispose of it at the national GDF (once it has been constructed). However, in the interim, ILW needs to be stored in purpose-built stores until the national GDF becomes available. Such ILW stores could either be located at a source site, or in line with NDA strategy, at a regional facility if appropriate. The fundamental purpose of ILW stores, sometimes referred to as Interim Storage Facilities (ISFs), is to maintain the filled waste packages in a satisfactory condition until they can be transported to the GDF. The design life of ILW stores / ISFs is greater than 100 years.

4.0.7 At Dungeness A, for the storage and disposal of operational ILW, Ductile Cast Iron Containers are currently being used. There are no plans for an ISF at Dungeness A for these wastes, since all packaged operational ILW is planned to be transferred for interim storage in the ISF at Bradwell in Essex.

[25] *Management of radioactive waste from decommissioning of nuclear sites: Guidance on the requirements for release from radioactive substances regulation*, published by the UK environment agencies.

4.0.8 At Dungeness B it is currently planned by its operator, EDF, that operational ILW present on that site will be encapsulated in stainless steel containers, and it is planned by EDF that there will be an ILW store constructed at the Dungeness B site. These packaging and storage plans will likely be reviewed once Dungeness B is transferred from EDF ownership to NRS.

4.1 Radioactive waste arising from the non-nuclear industry in Kent

4.1.1 The non-nuclear industry in Kent encompasses organisations including hospitals, the pharmaceutical industry, universities, research laboratories and veterinary medicine. These activities handle radioactivity for specific purposes and create low volumes of LLW. There are two known privately owned facilities which treat LLW in Kent; these are at Sittingbourne and Ashford.

4.1.2 A review of radioactive waste management requirements in Kent was undertaken by BPP Consulting on behalf of Kent County Council in 2017. This included a review of radioactive source permits on the Environment Agency public register which showed that along with Dungeness A and B, there were 14 sites in Kent permitted for keeping and use of Radioactive Materials and/or Disposal of Radioactive Waste. These are listed by category below:

Hospitals and Veterinary

1) East Kent Hospitals University NHS Foundation Trust, Ashford
2) Barton Veterinary Hospital, Canterbury
3) Kent & Canterbury Hospital, Canterbury
4) Darent Valley Hospital, Dartford
5) Dartford & Gravesham NHS Trust, Dartford
6) Bell Equine Veterinary Clinic , Mereworth, Maidstone
7) The Tunbridge Wells Hospital at Penbury, Tunbridge Wells
8) Kims Hospital, Kent Institute of Medicine and Surgery, Maidstone
9) Maidstone Hospital, Maidstone

Universities and Research

10) University of Kent, The Safety Office, Canterbury
11) York Bioanalytical Solutions Limited, Discovery Park, Sandwich

Waste Management Facilities

12) The Clinical Waste Incinerator, William Harvey Hospital, Ashford
13) Augean Treatment Limited, Discovery Park, Sandwich
14) The Active Collection Bureau, 20/20 Business Park, Maidstone[26]

4.1.3 The BPP study noted the existence of several landfill sites in other parts of England which could accommodate the management of solid non-nuclear LLW arising in Kent.

5 Decommissioning of the Nuclear Power Stations at Dungeness

5.0.1 Decommissioning of sites takes place systematically, achieving decommissioning and waste management objectives at each site in a way that progressively reduces hazards to people and the environment. The pace of decommissioning at any particular site is ultimately dictated by a number of key factors including but not limited to:

- Annual funding, which will act to enable or limit the amount of decommissioning that can be delivered across all sites;

[26] Specialist company in management of radioactive material with what is described on its website as a "purpose built permitted facility". Planning consent was granted by Maidstone Council in 2011 under consent MA/11/0561.

- emergent asset degradation and management considerations;
- revised end state assumptions, which may serve to act as an accelerator for decommissioning at particular sites to free land for the next planned use; and
- developments in the UK radioactive waste management supply chain, e.g. metal recycling capability.

5.0.2 As noted earlier, Dungeness A is owned by the NDA and operated by NRS (Appendix 2). Dungeness B is owned and operated by EDF (Appendix 2) but is planned for transfer to NRS likely sometime between 2029 and 2033 (after completion of Dungeness B site defueling). The decommissioning of Dungeness B will be undertaken by NRS, and synergies between the two sites are being explored in advance.

5.0.3 In 2022 NRS (then Magnox Ltd) set out a major strategy change which will lead to the decommissioning of each NRS site at a rate specific to each site, particularly in respect of when the reactors will be dismantled. At time of writing, the site-specific strategy for the Dungeness A site is in the process of being developed. However, a number of decommissioning activities have already taken place at the Dungeness A site. The skyline of the site has already been transformed dramatically as part of this clearance as the 26 metre tall turbine halls that dominated the southern part of the site have been demolished. The next major decommissioning project that is being prepared for is the demolition of the boiler complexes on either side of each reactor building and the central control building.

5.0.4 Dungeness B, (an Advanced Gas Cooled twin reactor) started operation in 1983 and formally ended power generation in 2021 and is currently defueling prior to the commencement of decommissioning activities. The decommissioning of Dungeness B is likely to take up until 2111.

5.0.5 Both stations lie within an environmentally sensitive area adjacent to sites nationally and internationally designated for their geological and biodiversity interest[27]. NRS's primary mission is to deliver each of its sites to their end state. The end state signifies the completion of decommissioning and site restoration activities and the beginning of a new chapter in the site's use. The next use may be different at each site, but for the Dungeness A (and likely Dungeness B) site the current end state being worked towards is restoration to shingle banks, though some below-ground concrete structures will remain.

6 Kent Minerals and Waste Local Plan

6.0.1 The Kent Minerals and Waste Local Plan 2013-30 was adopted in 2016 and includes the following policies on radioactive waste management:
Policy CSW 17 - Nuclear Waste Treatment and Storage at Dungeness
Policy CSW 18 - Non-nuclear Industry Radioactive Low Level Waste Management

6.0.2 The Kent Minerals and Waste Local Plan is being updated to cover the period 2024 to 2039 and this includes proposed changes to Policy CSW 17 and CSW 18 intended to ensure their consistency with national policy. The proposed changes can be seen in a 'tracked change' version of the Proposed Submission Draft KMWLP 2024-39.

7 Conclusions

7.0.1 There are a small number of existing locations in Kent where radioactive waste is generated and/or treated. The most significant of these are the two former nuclear power stations at Dungeness A and Dungeness B.

[27] Dungeness SAC, Dungeness to Pett Level SPA, Dungeness, Dungeness, Rye Bay and Romney Marsh Ramsar Site, Romney Marsh and Rye Bay SSSI

7.0.2 These facilities are located in a sensitive and vulnerable environment located immediately adjacent to internationally designated environmental sites and where coastal processes and flood risk management need to be considered and addressed. In many cases, Habitats Regulations Assessments for proposed developments will be required. Notwithstanding this, it is the role of the KMWLP to ensure that a suitable policy context exists to enable planning applications development proposals that may be forthcoming over the life of the plan to be determined appropriately.

7.0.3 The Kent Minerals and Waste Local Plan needs to consider the following issues and provide appropriate support:

- Compliance with the national NDA strategy and UK Government policy in relation to the decommissioning of nuclear power stations and the management of radioactive wastes;
- flexibility to allow the on-site disposal of some radioactive wastes where it is appropriate to do so, subject to regulatory requirements;
- flexibility to ensure that transfers of nuclear industry waste between power stations can be facilitated for their long-term storage and/or treatment where this achieves environmental and economic benefits, pending the construction of the GDF; and
- minimising the impacts of decommissioning and waste management upon the Dungeness SAC and the other adjacent international designated sites, taking all relevant factors into account.

7.0.4 There may also be a need during the plan period for new facilities for the management of non-nuclear sources of LLW waste from institutions such as research establishments, universities and hospitals. There is no data available on these types of waste arisings and there has been no interest expressed from operators in developing such facilities during the plan making process. Whilst it is considered that such waste arisings in Kent are likely to be low volumes, an enabling policy for such specialist waste streams needs to be retained within the plan.

7.0.5 Although there are currently no plans for the construction of Dungeness C, the reduced land requirements of small modular reactors means that Dungeness again may have the potential to site further nuclear power generation. It is still therefore essential that the KMWLP policy on nuclear waste is sufficiently flexible to embrace the possibility of new nuclear waste issues that may arise if Dungeness C or small modular reactors are constructed and operates during the plan period.

Appendix 1: Legislation

This appendix sets out the key legislation relevant to the management of a nuclear licensed site and/or radioactive waste. Many other regulations and Acts apply, such as the Construction (Design and Management) Regulations 2015, the Control of Noise at Work Regulations 2005, the Control of Asbestos Regulations 2012, the Control of Substance Hazardous to Health Regulations 2002, the Hazardous Waste (Wales) Regulations 2005 and so on, but most of these have been omitted here as, although applicable, they are not specific to nuclear sites or radioactive waste management.

Note that radioactive waste is not a controlled waste[28] as it is not covered by the Waste Framework Directive[29].

Nuclear Installations Act 1965 (as amended)

This Act provides for regulation of nuclear sites which operate nuclear reactors (including sites in the process of installing or decommissioning reactors) or processes ancillary to operation of a nuclear reactor, including the handling of nuclear fuels (i.e. materials used in nuclear reactors). Relevant sites are required to have a nuclear site licence issued by the Office for Nuclear Regulation (ONR) or the Secretary of State. Once a licence has been issued, the licensee's period of responsibility and the provisions of the Act continue to apply until, in the opinion of ONR, there has ceased to be any danger from ionising radiation from anything on the site. The Act also sets detailed rules concerning civil liability of nuclear site licensees in relation to harm caused by occurrences involving nuclear material / radioactivity.

Proportional Regulatory Control (PRC)

Proportional Regulatory Control (PRC) is an umbrella term for changes to regulations that will, amongst other things, allow on-site disposal of radioactive wastes without precluding site delicensing.

Working with regulators and the NDA, the Department for Energy Security and Net Zero (DESNZ), formerly BEIS, has identified that, in the final stages of decommissioning and clean-up, continued regulation by the ONR is unnecessary and that former nuclear sites should be regulated in a more proportionate way. A discussion paper on proportionate regulatory control, in particular the arrangements for existing nuclear third-party liability and delicensing nuclear sites, was published in November 2016. Fifty written responses – from individuals, stakeholder groups, local authorities, nuclear industry companies, academia, a non-governmental organisation and a trade union – were received during the 2018 consultation, to which the government responded.

Following its consideration of the consultation responses, the government set out its intention to amend the Nuclear Installations Act (1965). If approved by Parliament, this legislation would allow a nuclear site operator to apply to the ONR to exit the nuclear licensing regime once it can show that the ONR's requirements have been met. After the end of the nuclear site licence, health and safety regulation of sites would remain under Health and Safety Executive (HSE) regulation and environmental aspects under the relevant environment agency.

The changes are intended to allow a more proportionate approach to regulation, and to give site operators greater flexibility to optimise end states on a site-by-site basis, in consultation with local stakeholders. The proposed amendment would enable site operators to determine end states on a site-by-site basis, in consultation with local stakeholders and under regulation by the relevant environment agency.

[28] Controlled waste is household, industrial and commercial waste and any such waste. See http://www.legislation.gov.uk/ukpga/1990/43/section/75

[29] Exclusions are set out in article 2 of Directive 2008/98/EC on waste (Waste Framework Directive)

Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999

The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations, 1999, as amended (EIADR), is a legal instrument that in general requires the environmental impact of decommissioning nuclear power stations, and other nuclear reactors, to be considered in detail before consent for the decommissioning project to commence can be granted by the ONR (previously by the Health and Safety Executive). However, the specific requirements on the decommissioning project depend on whether the project started before or after EIADR entered into force on 19 November 1999.

In October 2005, the then Magnox Electric Ltd applied to the then HSE for consent to decommission Dungeness A Nuclear Power Station in accordance with the EIADR. An environmental statement accompanied the application. After a period of public consultation, the HSE duly granted consent in July 2006. Conditions were attached to the consent, including a condition relating to the production and maintenance of an Environmental Management Plan covering the on-going mitigation measures to prevent, reduce and, if possible, offset any significant adverse environmental effects of the decommissioning work[30]. Dungeness B site is yet to apply for decommissioning consent.

Ionising Radiations Regulations 2017

These regulations impose duties on employers to protect employees and other persons against ionising radiation arising from work with radioactive substances and other sources of ionising radiation. Certain duties are also imposed on employees.

The Radiation (Emergency Preparedness and Public Information) Regulations 2019

Under these regulations, if the operator of a nuclear site is able to confirm that the operations "do not create the possibility of causing a radiation emergency", then the local authority has no duty to create any emergency zones or off-site plans for the site. However, if the operator concludes that a "radiation emergency" is a possibility (regardless of the likelihood), then the operator is obliged to undertake a more detailed assessment of the radiological consequences of such events and submit it to the Local Authority so that they can determine the planning zone round the premises and create an appropriate off-site emergency plan.

Dungeness A site does not require an off-site emergency plan. However, at the time of writing, Dungeness B site does require an off-site emergency plan: Dungeness Nuclear Power Station emergency plan - Kent County Council

Environmental Permitting (England and Wales) Regulations (as amended) 2016

The Environmental Permitting (England and Wales) Regulations 2016 is a legislative system for industrial and waste installations which have the potential to cause harm to the environment. Of most relevance to nuclear licensed sites is the requirement for them to hold and comply with permits for the disposal of radioactive wastes on or from the sites, including for discharge of radioactivity to the environment. Dungeness A and Dungeness B each have their own environmental permits (at present), which for each site specifies approved disposal routes and discharge points, and places limits on quantities of radionuclides that may be discharged to the environment. Permits also impose a host of conditions and requirements including the need for the application of BAT (Best Available Techniques) and details in respect of environmental monitoring and reporting.

[30] Dungeness A Site Environmental Management Plan - GOV.UK (www.gov.uk)

Transport of Radioactive Wastes

Radioactive waste is classified as dangerous goods (Class 7/9) under retained EU regulations. As such, the transport of such material is governed by a number of regulations including:

- The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009; and
- European Agreement regarding the International Carriage of Dangerous Goods by Road (ADR) 2011.

These regulations include specific provisions to ensure the safe carriage of radioactive wastes. Limits are placed on the radioactive content of transport packages, as well as on the external radiation dose rates from packages, and in some cases package performance standards are set out to limit the consequences of an off-site transport accident should that occur.

Appendix 2: Organisations Involved in Radioactive Waste Management Relevant to Kent

Department for Energy Security and Net Zero (DESNZ)

This is the UK government department that, with the devolved administrations for Scotland, Wales and Northern Ireland, holds the budget for decommissioning and waste management at NDA sites in the UK. Prior to the creation of DESNZ in 2023, the government's energy portfolio was within the former Department for Business, Energy and Industrial Strategy (BEIS) and prior to the formation of BEIS in 2016 the portfolio was within the former Department of Energy and Climate Change (DECC).

Nuclear Decommissioning Agency (NDA)

In 2005 the NDA was established as a non-departmental public body under the Energy Act 2004. The NDA is responsible for the UK's public sector civil nuclear liabilities and their subsequent management, for developing and ensuring delivery and implementation of the programmes for interim storage and geological disposal of the UK's Higher Activity Wastes (HAW), and for developing a UK wide strategy for managing the UK nuclear industry's Low Level Waste (LLW). The Energy Act (2004) requires the NDA to prepare a strategy for carrying out its function and to periodically review that strategy.

Office for Nuclear Regulation (ONR)

The Office for Nuclear Regulation (ONR) is the UK's independent nuclear regulator and is an agency of the Health and Safety Executive (HSE). Its mission is to secure the protection of people and society from the hazards of the nuclear industry. ONR has responsibility for regulating safety and security at 35 various nuclear licensed sites in the UK. The Decommissioning, Fuel and Waste division regulates safety on a variety of nuclear fuel sites, including fuel cycle, nuclear research, waste management and decommissioning sites[31]. ONR is also the regulator in respect of the transport of radioactive materials and wastes.

Environment Agency[32]

The Environment Agency (EA) is a non-departmental public body, established in 1996 and sponsored by the United Kingdom government's Department for Environment, Food and Rural Affairs, with responsibilities relating to the protection and enhancement of the environment in England. Nuclear licensed sites such as Dungeness A and Dungeness B also hold environmental permits granted by the EA which control and limit the disposal of radioactive wastes on or from the sites, including gaseous and aqueous discharges to the environment.

Nuclear Restoration Services (NRS)

NRS is a wholly owned subsidiary of the NDA and until 31 October 2023 was known as Magnox Limited. NRS is responsible for safely decommissioning first generation nuclear power stations, including Dungeness A in Kent, and research sites Harwell and Winfrith[33]. NRS is also responsible for the clean-up and demolition of the former centre of fast reactor research and development at Dounreay.

EDF Energy Ltd

EDF Energy is one of the UK's largest energy companies and is the largest producer of low carbon electricity. Its nuclear generation business unit operates eight nuclear power stations including Dungeness B station in Kent. Its Nuclear New Build is tasked with the delivery of the new generation of nuclear power plants[34].

[31] See http://www.onr.org.uk/
[32] For Wales, the equivalent body is Natural Resources Wales, and for Scotland it is the Scottish Environment Protection Agency.
[33] See https://www.gov.uk/government/collections/our-sites
[34] Nuclear new build projects | EDF (edfenergy.com)

Nuclear Waste Services (NWS)

Nuclear Waste Services is a trading name of both LLW Repository Limited (LLWR) and Radioactive Waste Management Limited (RWM).

LLWR provides services to customers to treat and dispose of LLW including waste arising from Kent. On behalf of the NDA, it manages the national Low Level Waste programme to ensure that LLW is managed effectively. LLWR is the UK's national LLW disposal facility. It is located close to the West Cumbrian coastline near Drigg.

RWM, owned by the NDA, is charged with delivering a geological disposal facility (GDF) for England and Wales, for the disposal of HAW.

Other Contractors

Private contractors manage various waste management facilities around the UK which either hold permits for radioactive waste granted by the environment agencies or are able to accept limited quantities of Very Low Level Waste (VLLW) under exemptions from permitting. For example, Lillyhall landfill site in Cumberland is operated by FCC Recycling (UK) Ltd and is permitted to accept VLLW.

Appendix 3: Radioactive Waste Category Definitions

Out-of-Scope Wastes

The UK regulatory framework for radioactive substances allows for wastes below pre-defined nuclide-specific activity concentration levels to be excluded from its requirements. Such waste, generally referred to as being “out-of-scope”, may be managed in the same manner as non-radioactive (“conventional”) wastes. The regulatory requirement to minimise the volume of radioactive wastes disposed of by transfer to other premises makes maximising out-of-scope wastes one objective of radioactive waste management.

Low Level Waste (LLW) and Very Low Level Waste (VLLW)

LLW is defined as waste containing radioactive materials not exceeding 4 GBq/te of alpha or 12 GBq/te of beta / gamma activity. There is also a sub-category of LLW called Very Low Level Waste (VLLW), including a “Low Volume” and “High Volume” division. Currently, Low Volume VLLW disposals only apply to non-nuclear operators e.g. hospitals, universities etc.

Higher Activity Waste

In England the term Higher Activity Waste (HAW) refers to all radioactive material that has no further use that falls into the following categories: High Level Waste (HLW), Intermediate Level Waste (ILW) and the relatively small volume of Low Level Waste (LLW) that is not deemed suitable for disposal at the LLWR or the LLW facility at Dounreay.

HLW and ILW are both defined as exceeding the radioactivity limit for LLW, but HLW by definition requires its heat-generating properties to be taken into account in its storage and disposal, whereas ILW does not.

Controlled Burial and Lower Activity LLW

“Controlled burial” refers to the disposal of radioactive waste at a “conventional” landfill (i.e. not LLWR itself) which is licensed under environmental permitting regulations to accept it. Controlled burial takes place at landfill sites used for the deposit of substantial quantities of non-radioactive waste, and is subject to activity level and other restrictions.

The upper activity limit for such facilities is generally somewhere between the upper limit of VLLW and the upper limit of LLW (typically between 200 Bq/g and 800 Bq/g, determined by the facility permit). Sometimes waste which would meet controlled burial acceptance criteria is referred to as “Lower Activity LLW” (LALLW).

Various limitations apply to the controlled burial of radioactive wastes, such as the maximum activity per waste container, type of container, and surface dose rate of the container.

Appendix 4: Summary of NDA Strategy Aspects Relevant to Radioactive Waste Management and Decommissioning

Radioactive Waste Management

Developing Plans

The NDA expects its Site Licence Companies (SLCs) to identify and implement opportunities for managing wastes as soon as reasonably practicable. When making waste management decisions, the NDA expects SLCs to engage effectively with stakeholders, including regulators and local planning authorities. The NDA state that identifying common waste management challenges and opportunities across the NDA group may allow efficiencies to be realised and, potentially, the sharing of infrastructure and expertise.

Waste Characterisation

Characterisation and understanding the inventory play an important role in the management of waste generated by site decommissioning and remediation. Developing a detailed understanding of the radioactive inventory is essential to enable effective and efficient treatment, packaging, storage and disposal. In support of this, the NDA manages the production of the UKRWI on behalf of the UK government. This inventory is updated every three years.

Waste Treatment

The purpose of waste treatment is to process waste into a form to allow for its onward management including disposal, where routes are readily available, or for interim storage pending the development of suitable disposal routes (for HLW / ILW). Typically, treatment can involve a number of steps and a range of technologies, including:

- Sorting and segregation to initiate the practical application of the waste hierarchy;
- size reduction to make subsequent packaging or treatment easier;
- decontamination to achieve reclassification of the waste, to meet specific waste management facility acceptance limits or to reduce dose uptake for subsequent operations;
- thermal/chemical/physical processes: to change the waste characteristics to facilitate subsequent management steps;
- conditioning/immobilisation, which changes the form of the waste so the resulting product can be safely handled, transported, stored and disposed of; and,
- packaging, which is the process of loading waste into a container suitable for handling, storage (potentially long-term), transport and disposal.

The NDA aim to continue to drive technology development to help deliver a range of suitable treatment routes that enable the effective management of the variety of wastes in the NDA's inventory. The NDA are leading industry groups to coordinate waste treatment opportunities for thermal treatment technologies, encapsulation techniques and the management of "problematic" radioactive wastes. The NDA also have obligations to make their waste management infrastructure available to the wider nuclear industry where appropriate, e.g. access to LLW management services, HAW disposability advice and providing a route for HAW sealed sources where the use of the NDA's infrastructure would be the optimum route.

Waste Storage

Storage is defined as the holding of radioactive waste or material in a facility that provides for its containment with the intention of retrieval. Where waste cannot be disposed of immediately, storage facilities are required across the estate until a route becomes available. This could include an appropriate period of time for radioactive decay which may result in a change in waste classification. Storage facilities are a vital component of the NDA's waste management infrastructure and must be provided and maintained until suitable disposal facilities are available. The majority of the NDA's stores are for the storage of HAW and the NDA have robust storage arrangements, coupled with a disposability assessment process, to provide confidence that packages will be disposable at the end of the storage period. A number of stores have already been constructed across the NDA estate and plans are in place for the future construction of stores. In line with UK government and devolved administration policies and Committee on Radioactive Waste Management recommendations, the NDA's strategy allows for safe and secure storage of packaged HLW / ILW for a period of at least 100 years.

It may be necessary or desirable not to foreclose options and to store containerised raw waste in modern interim storage facilities to enable decommissioning or to progress hazard reduction. Such facilities will need to comply with regulatory requirements. The waste packages may require an additional treatment step prior to final disposal and this could place different demands on the storage system.

As well as the long-term storage of wastes on the site of origin, the NDA state that consolidation of packaged wastes from several sites to a single location may also achieve wider strategic benefits associated with release of land for other uses, reduction in hazard and security levels, and optimal use of infrastructure. Several examples are being implemented within the NDA estate, for example NRS storage consolidation options and the transfer of certain wastes from Harwell to Sellafield for treatment and/or storage, or the transfer of packaged ILW from Dungeness A to Bradwell for storage. Where wastes may be consolidated between sites, appropriate stakeholder engagement is required. Storage consolidation opportunities have been delivered and the NDA will continue to actively consider where there is potential benefit for further work in this area. Making the best use of existing assets and investigating store consolidation opportunities, where available, has the potential to provide cost and/or schedule benefits.

Waste Disposal

Disposal is the final stage of the waste management lifecycle and is the emplacement of waste into an appropriate facility with no intention to retrieve it. When applying the waste hierarchy, disposal is the least preferred option, and should only be pursued when all other options have been exhausted. The NDA acknowledge that the timely availability of fit for purpose, sustainable disposal capability and capacity is essential as it enables them to deliver their mission. The NDA need a broad range of disposal capability to manage the variety of radioactive wastes; this includes in situ management, licensed landfills, near-surface disposal and geological disposal. The NDA group benefits from the availability of existing national disposal facilities including the LLWR. However, the NDA recognise that further capability and capacity will be essential to complete the NDA's mission.

In the 2016 UK Strategy for the Management of Solid Low Level Radioactive Waste from the Nuclear Industry, it was recognised that some HAW, particularly wastes containing short-lived isotopes or those wastes lying at the LLW-ILW boundary, may be more appropriately managed within the LLWR. Therefore, the NDA is now actively exploring the opportunity to dispose of some ILW in the LLWR. The NDA state that they will work with Nuclear Waste Services (NWS), local stakeholders, regulators, governments and waste producers to ensure a suitable way forward is supported by the NDA's key stakeholders. This first step is part of a wider near-surface disposal programme.

In December 2018, the UK government published 'Implementing geological disposal – working with communities: updated framework for the long-term management of higher activity radioactive waste'. The policy document reaffirmed the UK government's policy for geological disposal of HAW and its commitment to working in partnership with communities that are willing to participate in the siting process. The NDA will continue to provide effective support for the UK government's Implementing Geological Disposal Programme. The siting process for the GDF is in its early stages and ongoing. The NDA have a disposability assessment process that enables them to progress the decommissioning mission while managing the risk to operations now and for future disposals.

The Radioactive Waste Strategy 2019 discussed an initial technical study that was carried out to investigate strategic options for the near-surface disposal of some of the HAW inventory that does not require the isolation and containment provided by a GDF. The NDA's strategic preference is to develop near-surface disposal capability which could provide an opportunity for a timely disposal solution to enable site decommissioning and, in particular, risk and hazard reduction programmes. There are two main near-surface disposal concepts that can be implemented: a surface vault facility, and a vault at some tens of metres depth, accessed from the surface, e.g. disposal silos. The NDA will continue to investigate the technical feasibility of the two main near-surface disposal concepts that could provide capability for the UK.

On-site disposal is currently undertaken by some SLCs. The environment agencies have issued joint regulatory guidance for releasing nuclear licensed sites from radioactive substances regulation when all activities involving the generation and disposal of radioactive wastes have ceased. This guidance describes the range of options for radioactive waste management including on-site in situ disposal and disposal for a purpose[35]. The NDA state that they will develop on-site disposal capability where it is optimal to do so.

Decommissioning

Once operations have ceased, the NDA's preference is generally to decommission sites as quickly as practicable. The benefits of this strategy are many and varied. For example, as well as reducing risks that facilities present to people and the environment, this strategy also allows the NDA to develop skills and approaches that are essential for maintaining decommissioning capability, proving new technologies, and strengthening the supply chain. However, in some cases there are clear benefits to be had from slowing or deferring work: To take benefit from radioactive decay; to adopt a 'lead and learn' approach; or to realise an opportunity for reusing a facility. Any decision to slow or defer decommissioning must be underpinned by an appraisal of the consequences of deferral including a robust evaluation of resources required to maintain the facility in a safe condition. In cases of deferred decommissioning, it is particularly important to determine an appropriate interim state that avoids making decommissioning more complex in the future.

In the NDA's previous strategy, the NDA committed to reviewing the optimum timing of NRS reactor decommissioning. This review clearly demonstrated that the optimum timing of decommissioning is case-specific, reflecting the nature and context of the facility or site in question. The NDA's preference, as set out in the current strategy, is to adopt site-specific strategies for each NRS site.

Identifying the preferred approach to decommissioning and remediation requires that the benefits and detriments of different options are balanced to deliver the greatest net benefit. The optimisation process considers stakeholder views on a range of relevant factors and is intended to enable transparent identification of sustainable solutions. The NDA's approach to prioritisation is influenced strongly by the level of risk to people and the environment. Even when risks are tolerable, risk reduction remains a key driver.

[35] 'Disposal for purpose' is the disposal of radioactive waste in a manner which serves to meet a particular engineering need such as using lightly contaminated rubble to fill voids, to construct roads or tracks, to construct screens or for necessary landscaping on site

Even where risks might be tolerable or broadly acceptable, there are other advantages to progressing with hazard and risk reduction that influence prioritisation. For example, all decommissioning and remediation projects have potential to minimise the burden of asset management; maintain and develop skills for future decommissioning and remediation projects; strengthen the supply chain; test emerging technologies; release land for reuse by the SLC or society; and demonstrate progress that instils confidence in the nuclear industry.

As far as possible, the NDA want the end of the process to result in the beneficial reuse of the sites. Rather than waiting for the next use to be identified through market interest, the NDA's strategy is to work with stakeholders to identify credible uses for the NDA's land that could benefit society either when the NDA's mission is complete or on an interim basis prior to achieving the site end state. Where the benefits of reuse are significant, the NDA may be able to justify quicker decommissioning and remediation, and ultimately release land earlier than originally scheduled.

Site Interim and End States

The site end state describes the condition to which the site (land, structures and infrastructure) will be taken at the end of the decommissioning process.

For many of the NDA's sites, the site end state is not scheduled to be achieved for many decades. For these sites it is difficult to define the site end state in detail without ruling out credible options prematurely. To support the development of plans and maintain clarity of the decommissioning journey, interim states are sometimes used to describe natural milestones on the way to the site end state. Site interim and end states together define objectives for ongoing management of structures, infrastructure and land quality as well as having implications for the management of waste arising from decommissioning and remediation. Site interim and end states have the potential to affect the local community and local authority development plans, for example in terms of employment and skills retention. This emphasises the need for ongoing stakeholder engagement.

An interim state is typically a stable state that marks a stepped reduction in risk or hazard and may be associated with a reduction in regulatory controls. An interim state can be followed by continued or deferred decommissioning, i.e. a decision may be taken to work towards the next interim state or to pause. However, particular care must be taken in defining interim states appropriate for deferred decommissioning to avoid making decommissioning more complex when it restarts in the future.

In cases where the site end state will not be achieved for many decades, it is unlikely that a site operator will have all the information required to evaluate all end state options, for example option evaluation would require predictions of future regulatory requirements and would presuppose what society may desire for a site at the time it will be remediated. Fixing a site end state too early would risk pursuing an unsuitable or undesirable end state and could rule out options currently not envisaged. However, without a vision of the final destination, it is difficult to set objectives for the ongoing decommissioning and remediation journey, and there is a risk of inadvertently foreclosing options for an end state. Consequently, the NDA's preference is to define an assumption for the end state at each site and to retain alternative options as a contingency. Site end states are currently being reviewed for all of the NDA's sites.

The NDA works with local authorities to ensure that site end states and statements on the next planned use of sites are consistent with local waste and development plans.

Guidance on Requirements for Release from Radioactive Substances Regulation

The environment agencies' expectations for optimisation of waste management are described in the GRR, particularly with respect to decommissioning wastes in the form of contaminated or activated concrete structures. This guidance brings together, in a transparent way, the various radioactive waste management options permissible under environmental legislation and explains how a site may eventually be released from associated regulatory control.

The GRR describes several waste management options that can be considered by site operators when they are determining the most sustainable approach to decommissioning a nuclear site.

The GRR notes that the relevant environment agency will only authorise disposal of radioactive waste on a site if it is satisfied that it is the optimised approach. The operator must prove this through development of an optimised Waste Management Plan. A Site Wide Environmental Safety Case (SWESC) must demonstrate that the disposal is safe for people and the environment at that time, during the remaining period of permitting and for the final condition of the site.

The GRR sets out the criteria to be applied when making a decision about whether a delicensed site should continue to be regulated by the relevant environment agency or if it can be released for unrestricted use.

Release of Sites for Other Uses

The next land use will be defined by the next owner in accordance with the planning regimes and taking account of stakeholder views as appropriate. However, to enable decommissioning and remediation to progress and offer greatest value for money, it is necessary to understand which land use(s) would be credible for the NDA's sites. The NDA can therefore make decisions about which structures and infrastructure should be removed and what is the most appropriate way to manage residual contamination or waste disposed of on site.

Many things can affect how a site could be used, including the location of the site and its distance from towns and transport links. Other factors to consider include the physical characteristics of the site, commercial interest, environmental designations and local planning policy. Evaluating these factors is important when identifying credible next uses, especially for sites where the next owner, and consequently the next use, is unknown. Understanding the value of land can also lead to identifying opportunities for interim use(s) that could provide income for the NDA's mission as well as socio-economic benefit for the local community. The NDA have confirmed that they will engage with local government to better understand what they need from land in their area.

Appendix 5: 2023 Consultation on UK Policy proposals for Managing Radioactive Substances and Nuclear Decommissioning

In March 2023 DESNZ published a consultation seeking views on proposals to update and consolidate the policies of the UK government and devolved administrations on managing radioactive substances and nuclear decommissioning into a single UK-wide policy framework.

This consultation paper is discussed here as it provides an overview of the existing UK policies on the management of radioactive waste, together with the changes that are currently being suggested and consulted upon. Whilst such potential changes have not yet been agreed, they set an initial policy intent.

Managing Solid Radioactive Waste

Some waste that contains very low levels of radioactivity poses little radiological risk to health and the environment and is therefore excluded from radioactive waste legislation (is "out-of-scope"). Disposal of this waste does not require a permit or other authorisation from the environment agencies. However, such waste may still be subject to conventional waste regulations and transport regulations and must be managed in accordance with those requirements.

In the UK, "in-scope" radioactive waste is classified in terms of the nature and quantity of radioactivity it contains and its heat-generating capacity. Current options available for disposal of in-scope radioactive waste include landfill sites or disposal on site for the least hazardous radioactive waste; and the Low-Level Waste Repository (LLWR) in Cumberland and the Dounreay Low Level Waste Facility (LLWF) in Scotland for more hazardous low level waste not suitable for disposal at landfill sites. Currently, under the policy of the UK Government and devolved administrations of Wales and Northern Ireland, all ILW is to be disposed of in a geological disposal facility along with high level waste.

Solid radioactive waste is produced from operational and decommissioning and clean-up activities in both the nuclear and non-nuclear sectors. Currently, the majority of this waste is generated by the nuclear sites which are the responsibility of the NDA and EDF Energy. Solid radioactive waste includes a range of materials such as paper, plastics, reactor components, ion exchange resins and filter media, contaminated metals, organic materials, concrete, graphite, and disused radioactive sources from medical and industrial irradiators[36].

However, the radioactive waste management landscape in the UK is changing as the decommissioning and clean-up of the nuclear estate, and to some extent the non-nuclear sectors, progresses. The ongoing decommissioning and clean-up of nuclear sites will result in higher volumes of less hazardous radioactive waste (ILW containing shorter-lived isotopes and large volumes of LLW), rather than the more hazardous ILW and HLW that is created primarily during the operation of nuclear facilities.

Current Policy on the Management of Radioactive Waste

The 2007 UK solid LLW policy facilitated better management of the significant volumes of solid LLW arising from the large-scale decommissioning and environmental remediation work across the nuclear estate as well as other sources of solid LLW. The Low Level Waste Repository Ltd (LLWR Ltd), now part of Nuclear Waste Services, has led the implementation of the policy and delivery of the nuclear industry solid LLW strategy on behalf of the NDA and UK Government and devolved administrations through the National LLW Programme.

The LLWR Ltd has also provided a series of commercial frameworks allowing waste producers to access a range of treatment and alternative disposal routes provided by commercial operators. The National LLW Programme has driven a change in thinking, behaviours and

[36] It can also include waste such as, sludges, flocculants, oils, solvents, and highly active liquor (HAL) from spent nuclear fuel reprocessing, if converted into solid forms to be managed as solid radioactive waste.

culture in waste owners and producers to deliver significant improvements in LLW management. This has resulted in up to 98% of LLW being diverted from disposal at the LLWR, to treatment and alternative disposal routes.

The management of HAW in the current policies followed by the UK Government and devolved administrations is based on the radioactivity classification of the waste. In England, the policies require that all HAW should be disposed of in a geological disposal facility, regardless of whether the risk the waste poses to people and the environment requires the level of isolation and containment provided by geological disposal.

In England HAW management policy is not underpinned by the principle of a risk-informed approach based on the radiological and any other hazards of the treatment or storage or disposal of the waste. Similarly, other than in Scotland, the policies of the UK Government and the devolved administrations do not currently explicitly require the application of the waste hierarchy, although in practice its principles are generally observed.

Geological Disposal of HAW

Geological disposal involves isolating radioactive waste deep inside a suitable rock formation to ensure that no harmful quantities of radioactivity ever reach the surface environment. This is achieved through the use of multiple barriers that work together to provide protection over hundreds of thousands of years. It is not a case of simply depositing waste underground.

International consensus is that by constructing a disposal facility within an appropriate geological setting deep underground the geological formations around the engineered facility will work together with the engineered barriers to isolate and contain the radioactivity for a very long period. Other countries that are progressing geological disposal include Canada, Finland, France, Sweden, Switzerland and the USA.

It remains the policy of the UK Government and the devolved administrations of Wales and Northern Ireland to manage the most hazardous radioactive waste through geological disposal. In December 2018 the UK Government published its most recent policy framework for implementing geological disposal (Implementing Geological Disposal: Working with Communities) and launched a new process for identifying a suitable location for a GDF in England. The Welsh Government launched a similar process for identifying a suitable location for a GDF in January 2019.

The UK and Welsh Governments have already set out processes for identifying a suitable location with a willing community for a geological disposal facility (GDF) for the UK's most hazardous radioactive waste. Government is not proposing any changes to these processes which are already underway.

Government recognises that communities considering hosting a GDF will want to have as clear as possible an understanding of the inventory for disposal before they take a Test of Public Support. This information will also be needed for the applications for development consent.

Government proposes to amend current policies on implementing geological disposal to make clear that not all ILW needs to be disposed of in a GDF. Where it is safe to do so less hazardous ILW can be disposed of in near surface facilities. This proposed change would bring policy on the management and disposal of ILW into closer alignment across the UK, as near surface disposal of some ILW is already an option in Scottish Government policy.

Proposed Policy Changes

At time of writing, following a public consultation, the UK Government was considering views on policy proposals that:

- require those responsible for creating and managing solid radioactive waste to apply a risk-informed approach as a decision-making framework for managing all solid radioactive waste. This means the properties of the waste (radiological, chemical, and physical) and

the risk the waste poses to people and the environment should be taken into consideration, rather than the current approach of managing the waste solely by reference to the radioactive waste classification it falls into;
- require the application of the waste hierarchy for the management of all solid radioactive waste.

If adopted, these policy proposals would free up space in some highly engineered stores at the sites that are currently being used to store ILW and would also allow faster progress in decommissioning and clean-up of other nuclear facilities and sites and support decommissioning in the non-nuclear sector (e.g. oil and gas industry). A risk-informed approach to managing all categories of solid radioactive waste builds on the approach taken for the management of solid LLW across the UK.

The waste hierarchy describes the principle of adopting options for managing waste that start with those that have least impact on the environment. It starts with waste prevention, requiring waste producers and owners to consider how they might design and implement their work so as not to create waste in the first place. If waste prevention is not practical or possible, then waste volumes should be minimised. Consideration about the re-use of items is next, followed by recycling where practicable, and then finally disposal.

Application of the waste hierarchy is already required for the management of solid LLW. It is also an explicit requirement of the Scottish Government's policy on the management of HAW in Scotland. However, current policy on the management of HAW pursued by the UK Government and devolved administrations in Wales and Northern Ireland does not specify application of the waste hierarchy. However, the UK Government and devolved administrations now consider that the waste hierarchy should be used as a framework for waste management decision-making for all categories of solid radioactive waste across the UK.

Application of the waste hierarchy to all solid radioactive waste should enable an effective balance of priorities including value for money, affordability, technical maturity, and the protection of health, safety and the environment. However, Government recognises that hazard and risk reduction and nuclear safety priorities may limit its application in certain circumstances. For example, some waste is not amenable to being managed at higher levels in the waste hierarchy and disposal may be the only option. Where waste does require disposal, Government and the environment agencies consider that this should be achieved in the optimal way, by applying the Best Available Techniques and Best Practicable Means (BAT/BPM), in order to minimise the impact of those disposal activities. Government proposes to make it explicit in the policy of the UK Government and devolved administrations that the waste hierarchy should be applied, where practicable, to the management of HAW, aligning policy for managing HAW with that already followed in Scotland.

Near-Surface Disposal for ILW

Under the current policy of the UK Government and the devolved administrations of Wales and Northern Ireland all ILW must be disposed of in a GDF. However, ILW can range from radioactive waste that is very similar in nature and properties to LLW to very hazardous radioactive waste, which needs the greater degree of isolation and containment that a GDF provides. The Committee on Radioactive Waste Management have noted that some of the radioactive waste from the decommissioning of the UK's nuclear facilities is likely to be short-lived ILW and commented that consideration should be given to its disposal with LLW in near surface facilities.

Since 2006 it has been the policy of the UK Government and devolved administrations of Wales and Northern Ireland to consider other disposal options (as well as a GDF) that could potentially improve the overall long-term management of HAW. The UK Government most recently reiterated this in its policy for implementing geological disposal in December 2018,

when it specifically referred to work the NDA is carrying out to examine alternative options for managing waste at the ILW and LLW boundary.

Work undertaken by the NDA, has demonstrated that a proportion of the ILW that will be generated during decommissioning does not require the level of isolation and containment provided by a GDF and may be safely disposed of in a near surface disposal facility.

Near surface disposal facilities could provide an earlier and more cost-effective solution than a GDF for a proportion of the less hazardous waste in the ILW category. A near surface disposal facility for ILW could be located at the surface or tens of metres below the ground. Its design would be dependent upon the location of the site and the level of hazard posed by the radioactive waste intended for disposal.

Near surface disposal is not a new concept. The UK already has near surface disposal facilities operating in the former county of Cumbria and Dounreay for the disposal of LLW. Near surface disposal of less hazardous ILW could offer a more sustainable solution by potentially speeding up decommissioning of some sites and freeing up the land earlier for other uses. Near surface disposal has the potential to reduce the burden on future generations of managing some of the waste by reducing the need for prolonged storage, storage facility construction and maintenance, and possible waste repackaging. Near surface disposal of short-lived and low activity ILW is already operating safely in Finland, France, Spain and Sweden.

The NDA has estimated that by 2040 up to 21,000m³ of less hazardous ILW could be disposed of in a near surface facility with net savings of £0.3billion to £0.45 billion. The NDA has estimated it could take around 10 years to identify a site and develop a new facility.

Proposed Siting Framework for Near Surface Disposal for ILW in England and Wales

A GDF will be a multi-billion pound engineering and infrastructure project. The process to identify and select a site for a GDF requires detailed technical work that could take around 15 to 20 years. The UK and Welsh Governments' approach therefore is to find a community that is willing to host a GDF. However, the Government consulted on proposals for a different approach to developing a near surface disposal facility because it would be a significantly smaller project. The investigations necessary to identify a suitable location would be far less complex and time consuming, without the need to characterise geological features at great depth over a large area. The construction of a near surface disposal facility, particularly the at surface concept, is much less complex with fewer barriers necessary to contain the type of waste that could be disposed of there. An at surface/near surface disposal facility would be similar to the engineered vaults currently in operation at the LLWR in the former county of Cumbria.

The NDA has estimated it could identify a suitable site, obtain authorisation from the relevant regulators and planning permission, and construct a near surface facility in around 10 years. A near surface disposal facility below the surface would likely take longer to develop than an at surface disposal facility but would still be a considerably smaller and less complex project than a GDF.

The Government expects the NDA to develop at least one near surface disposal facility on land within its estate in either England or Wales, subject to a robust business case and authorisation from the relevant regulators. The proposed siting policy would require a transparent approach for the evaluation of potential sites, in line with the NDA's existing transparency and openness policy.

The Government proposes that the NDA should make any near surface facilities it develops available to other nuclear and non-nuclear industry managers of radioactive waste, on the basis of suitable commercial terms. The NDA should also provide a community benefits package to the people that live in the local area of its chosen site or sites, as it currently does for the community near the LLWR, in recognition of the service that the community is providing

for the rest of the UK. It will be for the NDA to determine the monetary value of the package and to work with the community to decide how it is to be administered and distributed in line with its existing socio-economic policies for supporting communities around NDA sites.

Any near surface disposal facility for ILW will be subject to the usual local planning requirements under the Town and Country Planning Act 1990. Before selecting a site, the NDA would engage with representatives from local communities in areas that may be suitable. The Government consultation does not propose to make it a nationally significant infrastructure project.

On-Site Disposal

The proposed policy update makes it clear that the UK does not recognise entombment as a decommissioning strategy, whereby all or part of the facility is encased in a structurally long-lived material. This is not considered an option where the permanent shutdown of a facility has been planned. In the UK, entombment may only be considered under exceptional circumstances, for example, following a severe accident. This position is in line with the International Atomic Energy Agency's safety standards. It is not the same as on-site disposal (including in-situ disposal).

During the final stages of decommissioning and clean-up of nuclear facilities, large amounts of rubble are generated. A small percentage of this material may be contaminated with radioactivity and would therefore be classified as LLW. In addition, there may be contaminated substructures, pipelines and soils on the sites. Excavating this waste, packaging it and transporting it for disposal in approved facilities offsite can result in negative impacts, such as increasing the risks to workers' health and safety during excavation, increased HGV traffic and associated noise, dust, pollution and carbon dioxide emissions. In some cases, it may be safer and more sustainable to manage contaminated waste on site, rather than to excavate it and transport it for disposal elsewhere. There are three ways in which this can be done:

- building engineered facilities on site (for waste that requires this level of protection);
- minimising the generation of radioactive waste by managing radioactive contamination of soils, sub surface structures or pipelines in-situ (known as in-situ disposal); and
- using lightly contaminated rubble to fill voids, to construct roads or tracks, to construct screens or for necessary landscaping on site (known as "disposal for a purpose").

Existing environmental legislation allows site operators to apply for a permit for any of these waste management options. The English, Scottish and Welsh environment agencies have jointly set out their requirements regarding decommissioning and clean-up of nuclear sites and these requirements include options for on-site disposal. In addition to an environmental permit, on-site disposal may also require planning permission.

On-site disposal has the potential to further reduce the risks associated with excavation as well as reducing environmental impacts such as HGV traffic, dust, noise, pollution and carbon dioxide emissions. The UK Government and devolved administrations therefore support the on-site disposal of suitable LLW and VLLW on nuclear and former nuclear sites, where it is safe and where overall social, environmental and economic impacts are lower than those of other disposal options.

Appendix 6 Comments from the Environment Agency, May 2022

Kent Waste and Minerals and Local Plan Refresh - Environment Agency comments on the draft revised wording of Policy CSW17 May 2022

"*Thank you for consulting us on the revised wording of Policy CSW17. We are pleased to see a requirement for environmental assessments included in the policy. This will include what we need to see in the land and water before, during and after the waste activity from a groundwater protection point of view. The monitoring itself will be included in the environmental permit.*

Please note the following comments and clarifications regarding the GRR (Management of radioactive waste from decommissioning of nuclear sites: Guidance on Requirements for Release from Radioactive Substances Regulation).

Operators do not require us to authorise the construction of a dedicated storage facility e.g. such as ILW store. We would be interested if such a store at Dungeness represents best available techniques and any radioactive gaseous, aqueous or secondary wastes produced by or from such a facility would fall under an RSR (radioactive substances regulation) environmental permit. The Operator must demonstrate BAT for the disposals of these wastes. A permit variation may be required to allow disposals from any store. We would also expect any store to take into account sustainability in its construction and management.

Operators do need to be authorised by us before they can dispose of radioactive waste on-site, whether by emplacing waste or leaving it in situ. Provisions are made under the GRR.
Such a waste disposal can include;

1. On-site disposal of radioactive waste in a dedicated disposal facility. An operator may apply for authorisation to dispose of radioactive waste to a dedicated near-surface on-site disposal facility. For full guidance on the Environment Agency's requirements for authorisation of such a facility operators should refer to our guidance 'Near-surface Disposal Facilities on Land for Solid Radioactive Wastes: Guidance on Requirements for Authorisation' (NS-GRA) (EA et al., 2009). Such a dedicated radioactive waste disposal facility will require its own environmental safety case (ESC), in line with the provisions of the NS-GRA. The operator will need to take full account of the risks assessed in the facility-specific ESC within the SWESC (Site Wide Environmental Safety Case) for the site as a whole.

2. On-site disposal of waste in situ. An operator may apply for authorisation to dispose of radioactive waste, such as a buried object or structure, by leaving it permanently in situ.
3. An operator may apply for authorisation to dispose of radioactive waste on-site for a purpose such as:

- *making land safe, for example by filling voids, constructing roads, tracks and hard-standing*
- *constructing bunds, barriers or screens*
- *landscaping to comply with local planning authority requirements*

The use of decay storage can be used at site provided a credible plan for the retrieval and disposal of such wastes at a later date is demonstrated in the WMP (below).
We will only authorise any such disposal if the Operator can demonstrate to us that

any disposal is optimised i.e. the requirement is that the Operator must demonstrate that any on site disposal management option when considered in combination with the management options for all other radioactive wastes and radioactive contamination at the site, ensures overall exposures of people are As Low As Reasonably Achievable (ALARA). Also, where any disposal option has been demonstrated to be optimal, the Operator must consider how the design, construction and implementation of that disposal ensures exposures are ALARA.

We will not authorise any disposals that are not optimised solutions for the disposal of radioactive waste. The Operator may propose such disposals, but they will not be permitted without the relevant demonstration of optimisation. Operators will need to consider the non-radioactive properties associated with radioactive waste as part of the optimisation process, and should address radioactive and non-radioactive hazards in an integrated manner when assessing radioactive waste management options. Replacement legislation for Article 37 of the Euratom Treaty may also need to be considered by Operators when considering on site disposals of radioactive waste. It is expected that the emplacement of radioactive waste above or under the ground without the intention of retrieval is within scope of this legislation and that Operators will need to make an application through BEIS. We will not issue any authorisation until a positive outcome is received.

Under the GRR the Operator must make produce and maintain a Waste management plan (WMP) and SWESC.

The WMP is required to manage the programme of disposals of radioactive waste until work involving radioactive substances is completed. The WMP is a practical plan to manage the programme of disposals of radioactive waste arising from a site. The WMP is implemented until work involving radioactive substances is completed to achieve the site reference state. The site reference state will either be achieved immediately after such work is complete, or after a period of control for the purpose of radiological protection.

The SWESC is required to demonstrate that the health of members of the public and the integrity of the environment will be adequately protected, both during and after radioactive substances regulation. The SWESC should describe and substantiate the level of protection provided both during the period of RSR and afterwards. It should describe the site reference state and specify the time by which that state will be achieved.

The WMP and SWESC are closely aligned. The requirement to produce a WMP and SWESC is in every nuclear permit. Each site has differing dates depending on the operations and the lifecycle of the sites in question. However a WMP and SWESC may need to be in place before any application for on-site disposal at site as it is a specific permit requirement to produce these documents by the dates outlined in the RSR permit.

As well as the RSR permit, other legislation may apply to the disposal of radioactive wastes e.g. groundwater regulations. Also management and disposal of non-radioactive wastes may need to follow environmental legislation. This may include groundwater regulations and deposit for recovery and other aspects of the waste framework directive. We encourage operators to take a joined-up approach to meeting their obligations under other environmental laws.

Operators will need to consider the non-radioactive properties associated with radioactive waste as part of the optimisation process, and should address radioactive and non-radioactive hazards in an integrated manner when assessing radioactive waste management options."