

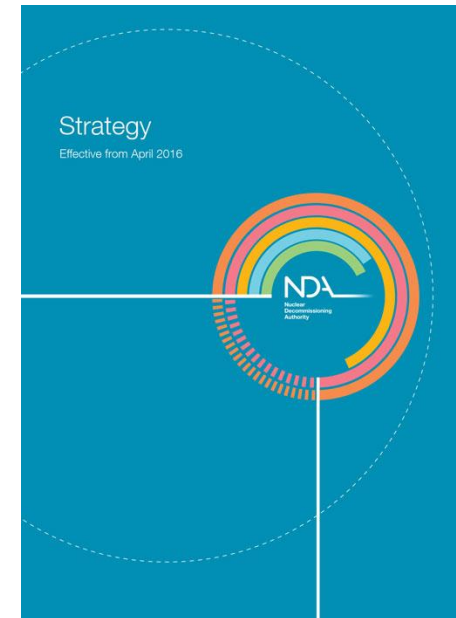
NDA Strategy – Integrated Waste Management

Nuclear Decommissioning Authority



Strategy Development

- Energy Act 2004 requires us to review, update and consult on our Strategy every 5 years
- The updated strategy
 - sets the context of our journey and mission priorities
 - is a stock take of where we are with our strategy development
- Specific operating targets are identified in our Business Plan



Strategy development

- NDA Strategy document published on the 1st April 2016
- Driving themes
 - Site Decommissioning & Remediation
 - Spent Fuels
 - Nuclear Materials
 - Integrated Waste Management
- Critical Enablers



Integrated Waste Management

- **Objective:** To ensure that wastes are managed in a manner that protects people and the environment, now and in the future, and in ways that comply with government policies and provides value for money.
 - Effective waste management is an essential requirement for the delivery of our mission and is a significant part of our programme
 - Our strategy supports key risk and hazard reduction initiatives by enabling a flexible approach to long-term waste management
 - Waste management routes across the estate can continue to be optimised
 - IWM Topics: Radioactive waste, Liquid & gaseous discharges and Non-radioactive waste



Dealing with the legacy



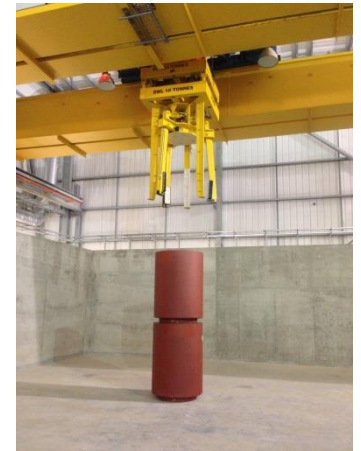
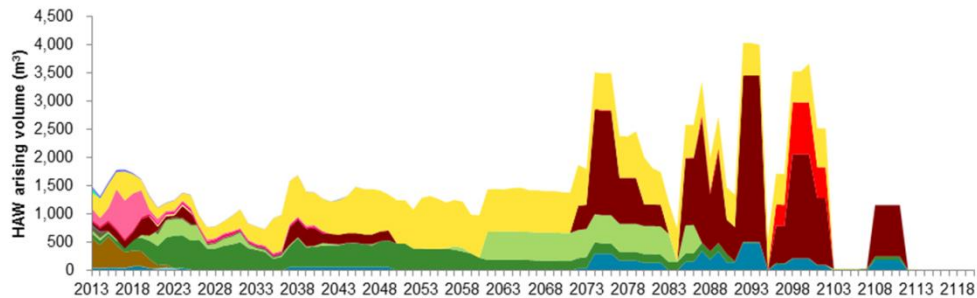
Waste groupings

Waste groups	Sellafield ⁽¹⁾	Magnox stations	Dounreay	Harwell	Winfrith	LLWR
Activated metals	✓	✓	✓	✓	✓	
Activated other materials			✓	✓		
Contaminated metals	✓	✓	✓	✓		
Contaminated other materials	✓	✓	✓	✓		
Desiccants & catalysts		✓				
Flocs	✓		✓			
Fuel cladding & miscellaneous wastes	✓		✓			
Fuel element debris		✓				
Fuels & uranium residues	✓	✓	✓	✓		
Graphite (ILW)	✓	✓	✓	✓	✓	
Graphite (LLW)	✓	✓				
High level waste	✓					
Inorganic ion exchange materials	✓	✓	✓			
Mixed wastes	✓	✓	✓	✓	✓	
Organic ion exchange materials		✓				
Plutonium contaminated materials	✓		✓	✓		✓
Raffinate (ILW)			✓			
Sludges	✓	✓				
Uranium & thorium contaminated material			✓			
Wastes being conditioned	✓	✓		✓		



Radwaste strategy development

- IWM principles have been developed
- NDA HAW Strategy to be published in the near future
- UK LLW Strategy for the Nuclear Industry and NDA HAW Strategy are standalone documents with an aligned format and overall direction at a principle level
- We are moving towards a single radioactive waste strategy, moving away from category (e.g. ILW, LLW) based waste management route planning to a risk based lifecycle approach to the management of wastes:
 - Planning & preparation
 - Treatment & Packaging
 - Storage
 - Disposal



IWM Principles

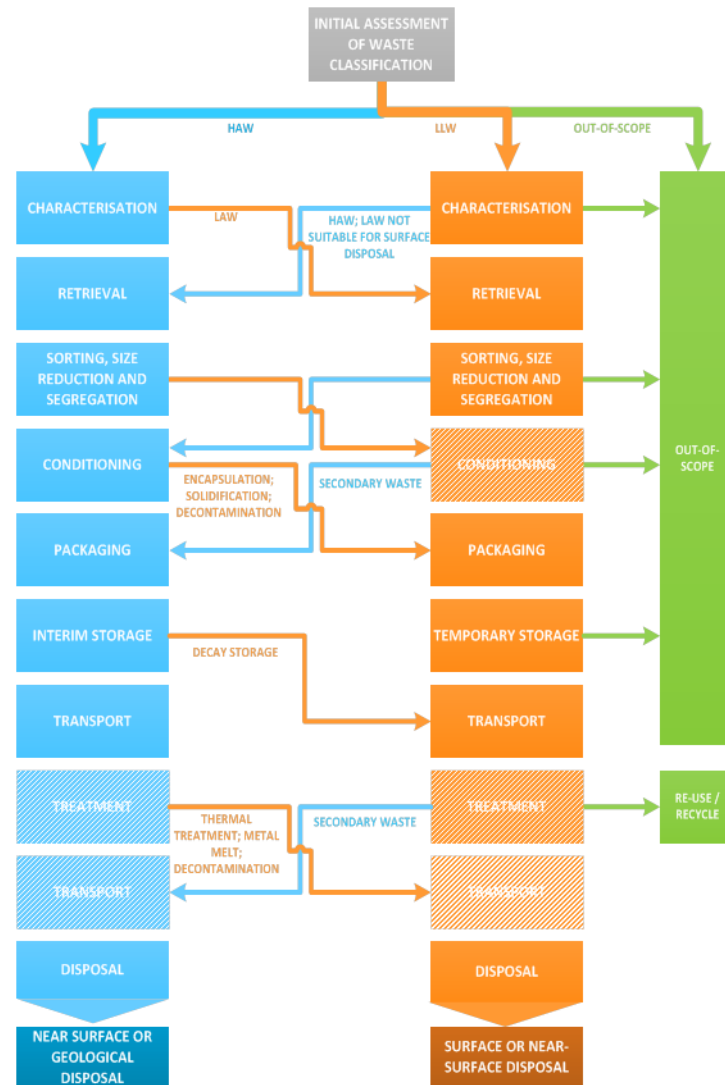
Our Strategy

The development and implementation of each of the topic strategies within the Integrated Waste Management theme are informed by the following key principles:

- supporting key risk and hazard reduction initiatives by enabling a flexible approach to long-term waste management. For some wastes it may be necessary to adopt a multi-stage process to achieve a final disposable product, which could include the separate management of bulk retrievals and residual material to support hazard reduction programmes
 - taking into consideration the entire waste management lifecycle, including how waste management is needed to support other NDA strategic or wider UK initiatives such as large-scale decommissioning programmes
 - applying the Waste Hierarchy (figure 7), which is recognised as good practice and should be used as a framework for waste management decision-making. This enables an effective balance of priorities including value for money, affordability, technical maturity and the protection of health, safety, security and the environment
- promoting timely characterisation and segregation of waste, which delivers effective waste management
 - where appropriate, provide leadership giving greater integration across the estate and the supply chain, in particular by seeking opportunities to share treatment and interim storage assets, capabilities and learning
 - supporting and promoting the use of robust decision-making processes to identify the most advantageous options for waste management
 - enabling the availability of sustainable, robust infrastructure for continued operations, hazard reduction and decommissioning.



The waste management lifecycle



KEY

- Waste lifecycle step common for all wastes
- ▨ Waste lifecycle step applicable to some wastes

Planning & preparation

- Essential process for successful waste management
- Waste producers should seek to identify and implement opportunities for managing wastes as soon as reasonably practicable
- Options throughout the lifecycle
- Characterisation plays an important role in the decommissioning of nuclear facilities
- Appropriate waste characterisation data and forecasting estimates help to underpin waste management plans
- The NDA is responsible for managing the compilation of the UKRWI on behalf of DECC

**The NDA Radioactive Waste Strategy
– A lifecycle approach**



Treatment & Packaging

- The main purpose of treatment & packaging is to process raw waste into a form that is suitable for long-term storage and/or disposal and will cover a number of steps and technologies including:
 - Retrieval of waste
 - Sorting & segregation
 - Size reduction
 - Decontamination
 - Thermal/chemical/physical treatment
 - Conditioning/immobilisation



**The NDA Radioactive Waste Strategy
– A lifecycle approach**

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
- New storage facilities are being built across the estate to store wastes until disposal routes become available
- Our plans for new and existing stores need to include maintenance programmes, refurbishment and if required, store replacement for some older stores
- At times it will be necessary to store containerised raw waste in modern interim storage facilities
- Radioactive decay during storage could lead to a change in the category of the waste or in the way the packaged waste may be handled

**The NDA Radioactive Waste Strategy
– A lifecycle approach**



Disposal

- Disposal of wastes is the final stage in the lifecycle and involves the emplacement of waste in an appropriate facility without the intention of retrieval
- NDA owns the UK LLWR which is managed by LLWR Limited
- Dounreay Site Restoration Limited (DSRL) operates a VLLW and LLW disposal facility adjacent to their site and Sellafield Limited operate an on-site VLLW disposal facility
- The NDA & RWM will continue to provide effective support for UK government's Implementing Geological Disposal Programme. RWM is responsible for the programme that delivers a GDF

**The NDA Radioactive Waste Strategy
– A lifecycle approach**



Strategy development

- Waste treatment technologies:
 - Reducing overall waste volumes
 - Thermal treatment
- Boundary wastes:
 - Large volume of waste at the ILW/LLW boundary
 - Close working between LLWR Ltd & RWM
- Alternative disposal options

