

# Ensuring robust decisions and deployable solutions in UK LLW management

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**April 8 – 10, 2014**

# Content

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- **Context and background (NDA, UK LLW inventory)**
- **UK Nuclear Industry LLW Strategy**
- **LLW management decisions**
- **Support**
- **Progress**

# Nuclear Decommissioning Authority

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- Public body created in 2004

## *Core objective*

- ensure historic civil public sector nuclear legacy sites are decommissioned safely, securely, cost effectively and in ways that protect the environment.

## *Also*

- operate existing commercial facilities (& use revenue)
- scrutinise the site decommissioning plans of EDFe
- implement geological disposal
- deliver and implement LLW strategy

# Nuclear Decommissioning Authority

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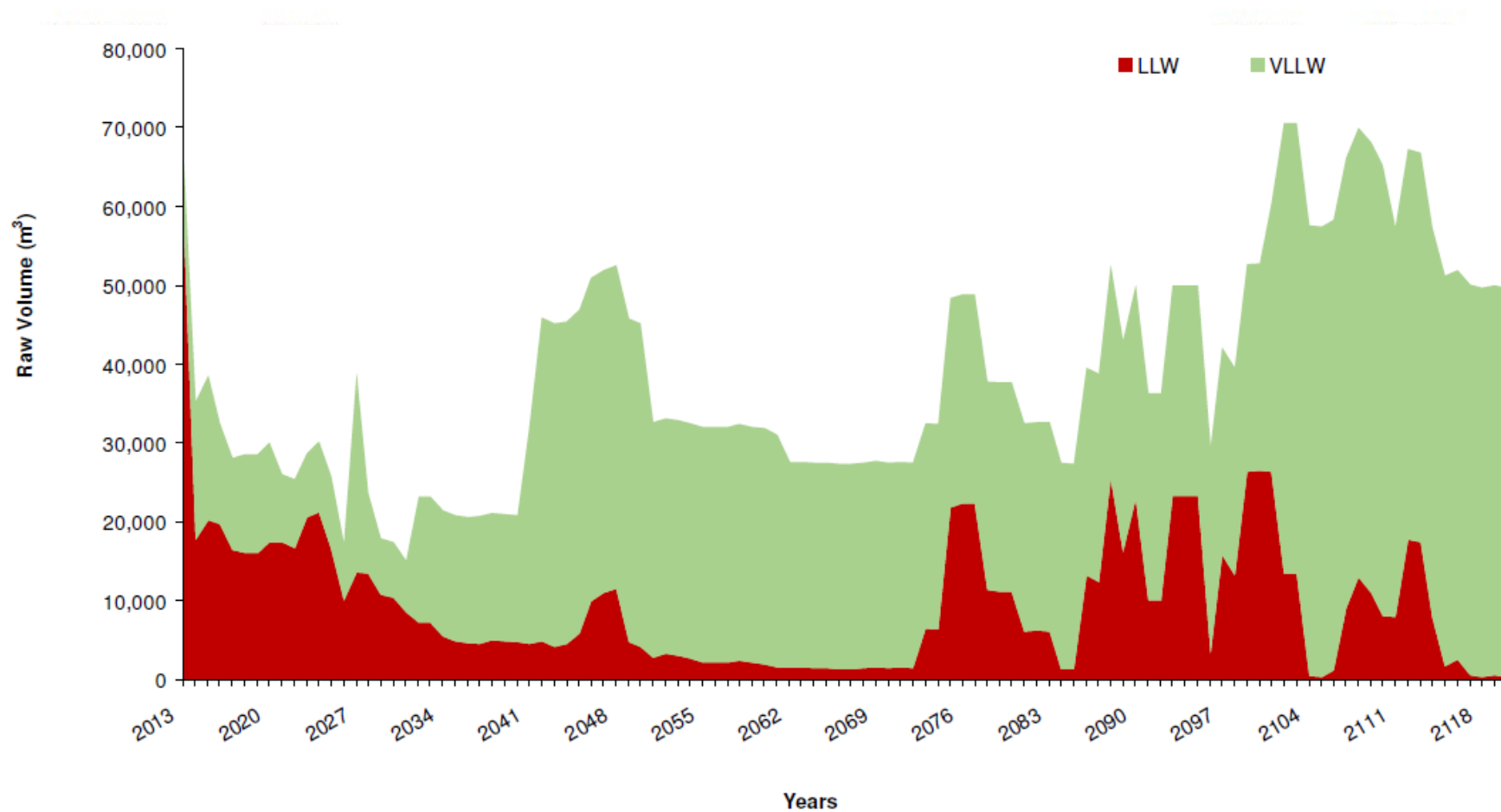
*We are involved in*

- Power generation
- Reprocessing
- Decommissioning nuclear sites
- .... generating and managing waste

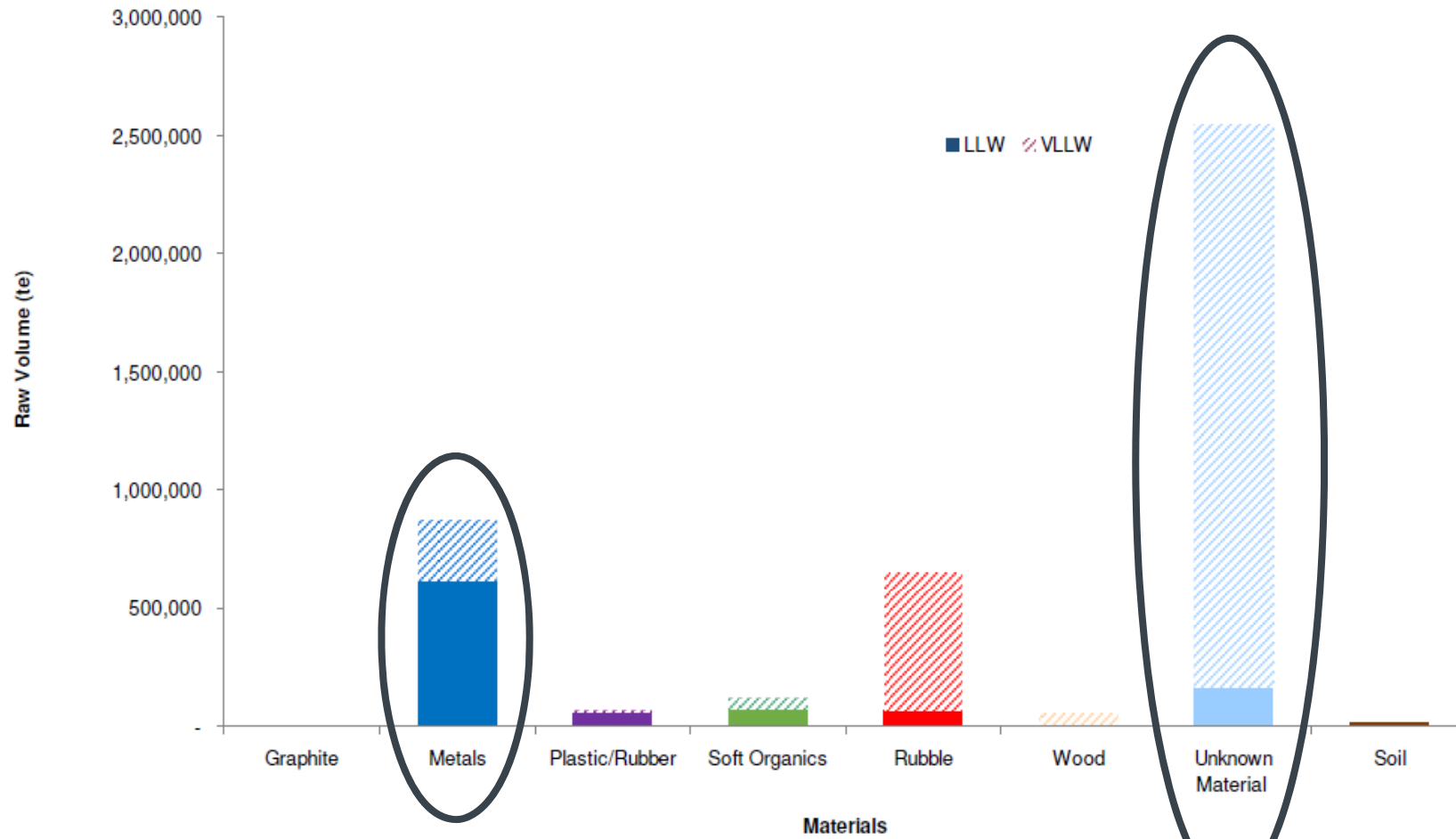
*Also*

- We own the UK Low Level Waste Repository
- UK's Strategic Authority for LLW management

# LLW Inventory



# LLW Inventory



# The problem...



# UK Nuclear Industry LLW Strategy

## 2.1 Principles

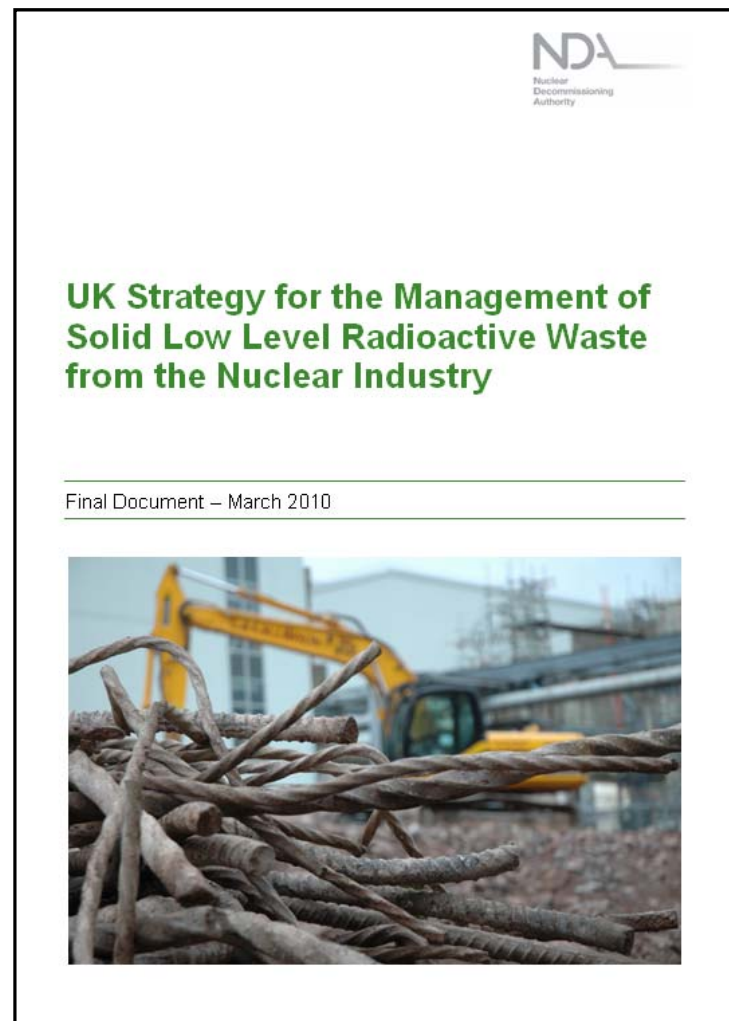
## 2.2 Integrated Waste Management

## 2.3 Planning and decision making

## 2.4 Characterisation and waste information

## 2.5 The Waste Hierarchy

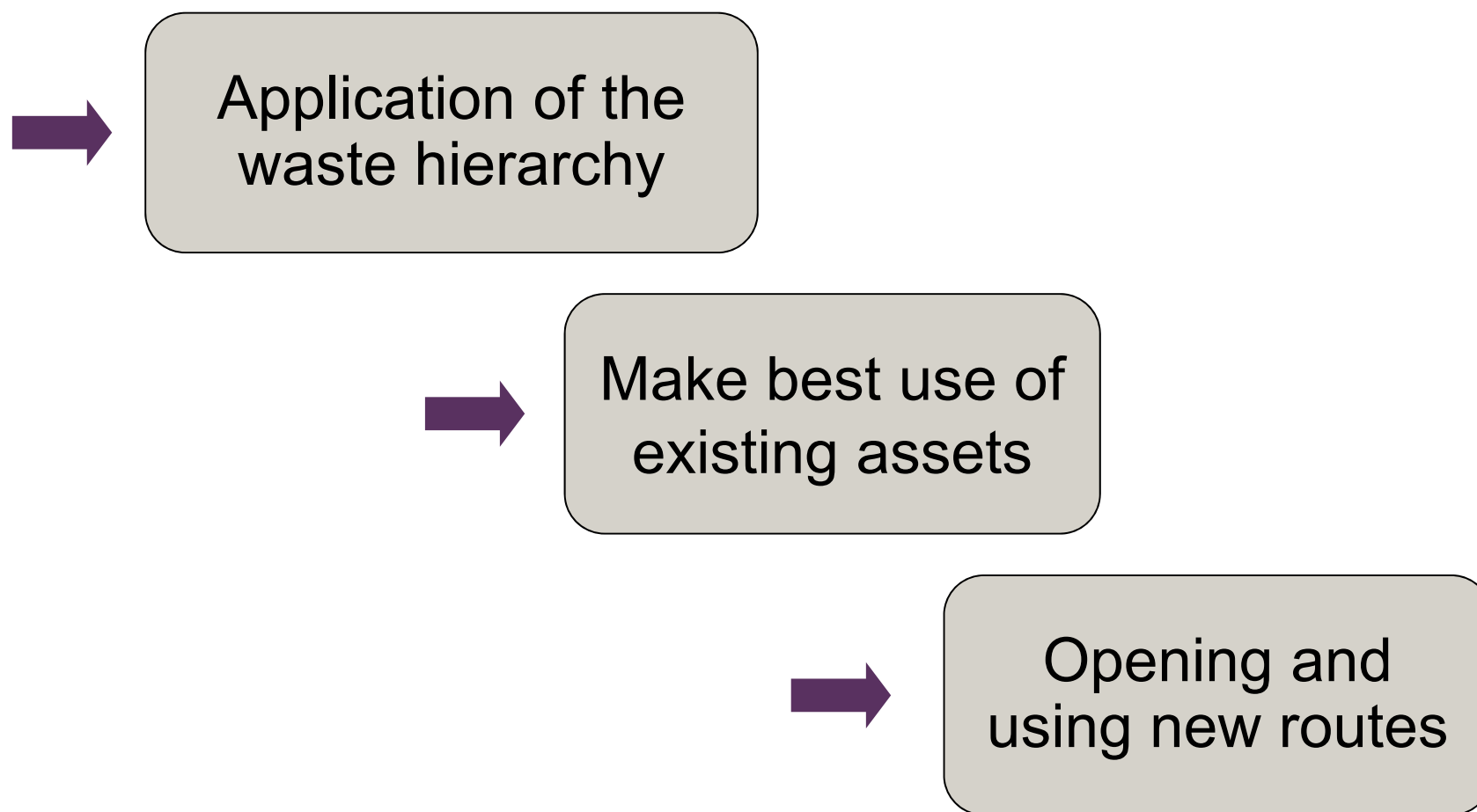
## 2.6 Packaging and transport



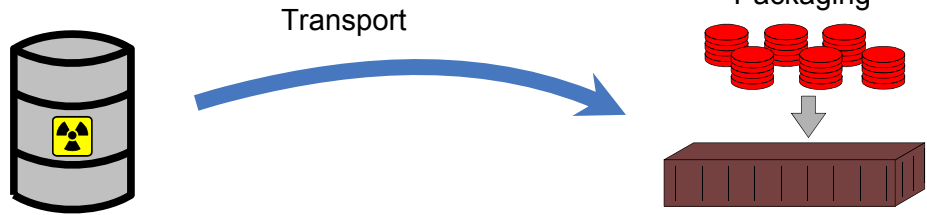


# UK Nuclear Industry LLW Strategy

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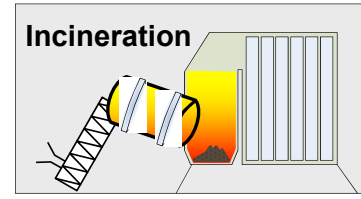
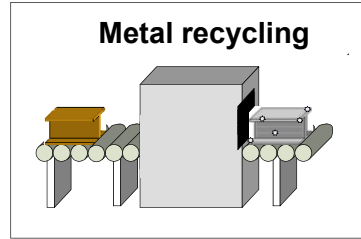
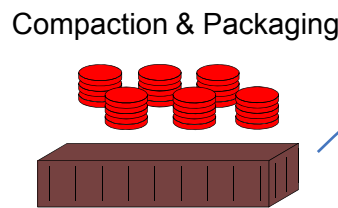
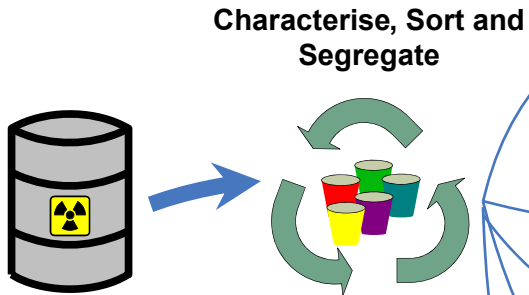
# LLW management in the past



# Long-term management options

LLWR

# LLW Strategy



Reuse and Recycle

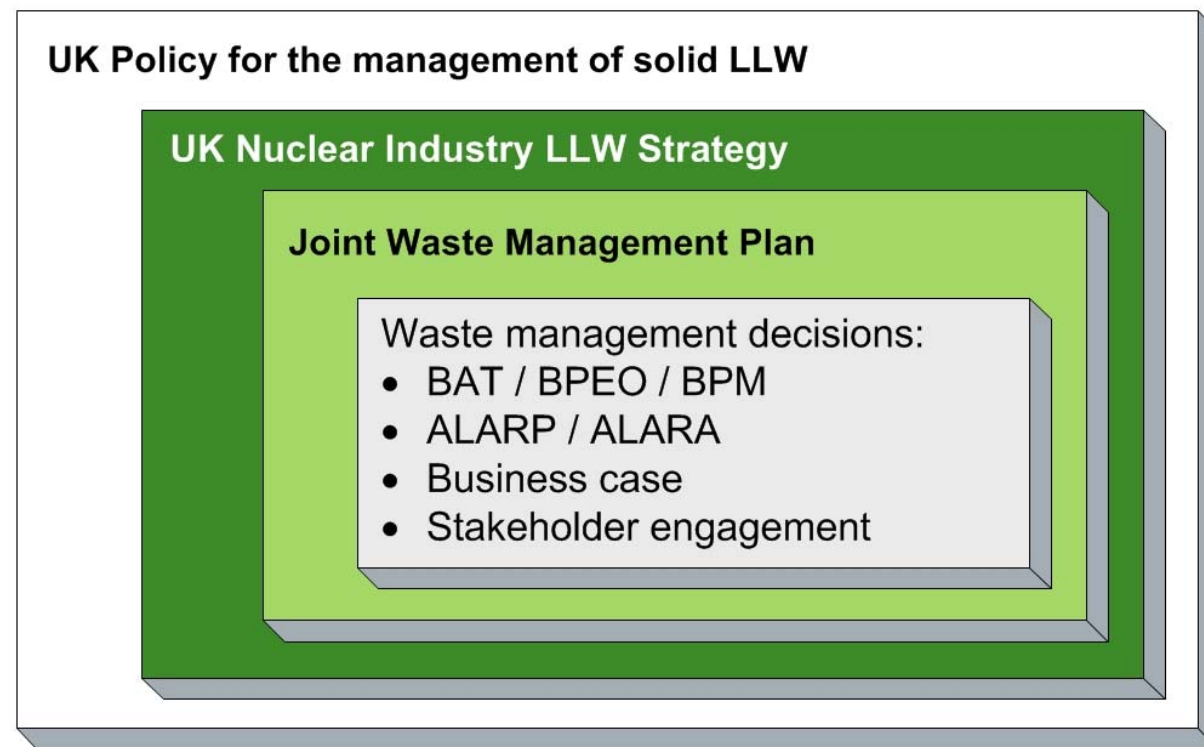
Alternative VLLW Disposal

Exempt waste

# Increased choice

Increased choice = more decisions

... more decisions = more difficult...?



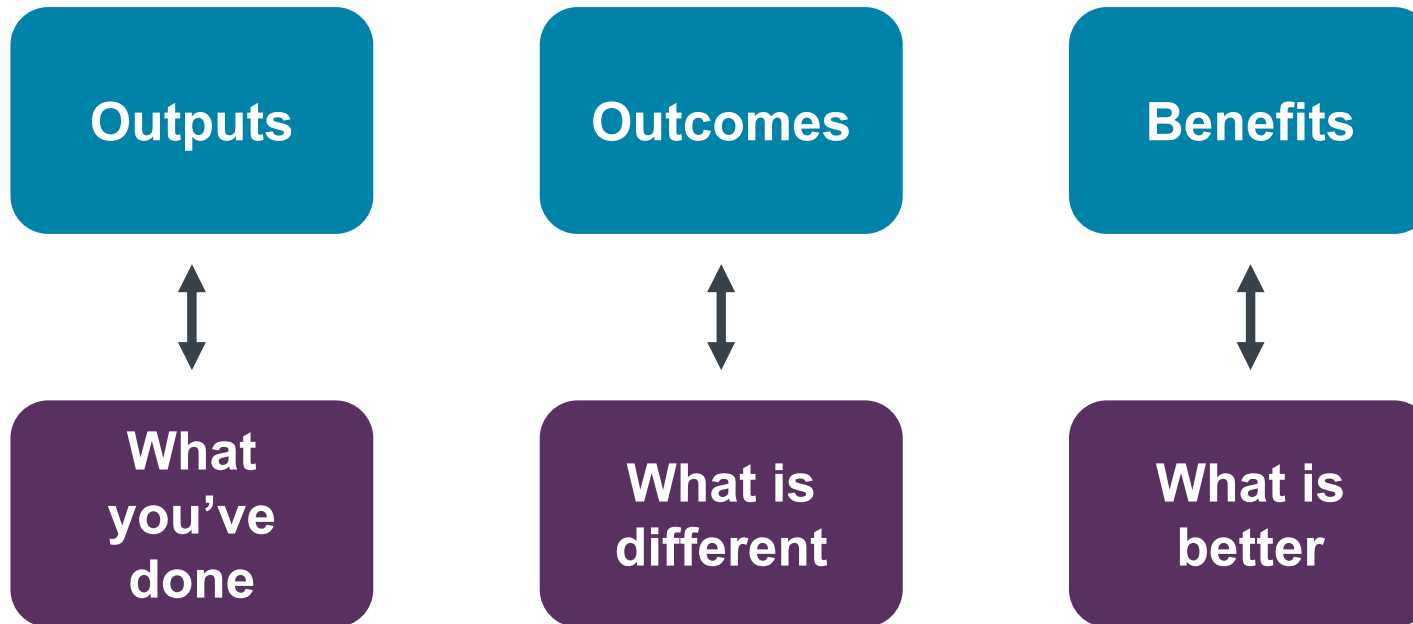
# Decisions

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**...first work out what you  
“could” do and then work  
out what you “should” do**

# Decisions

## “Benefits realisation”



# Key factors

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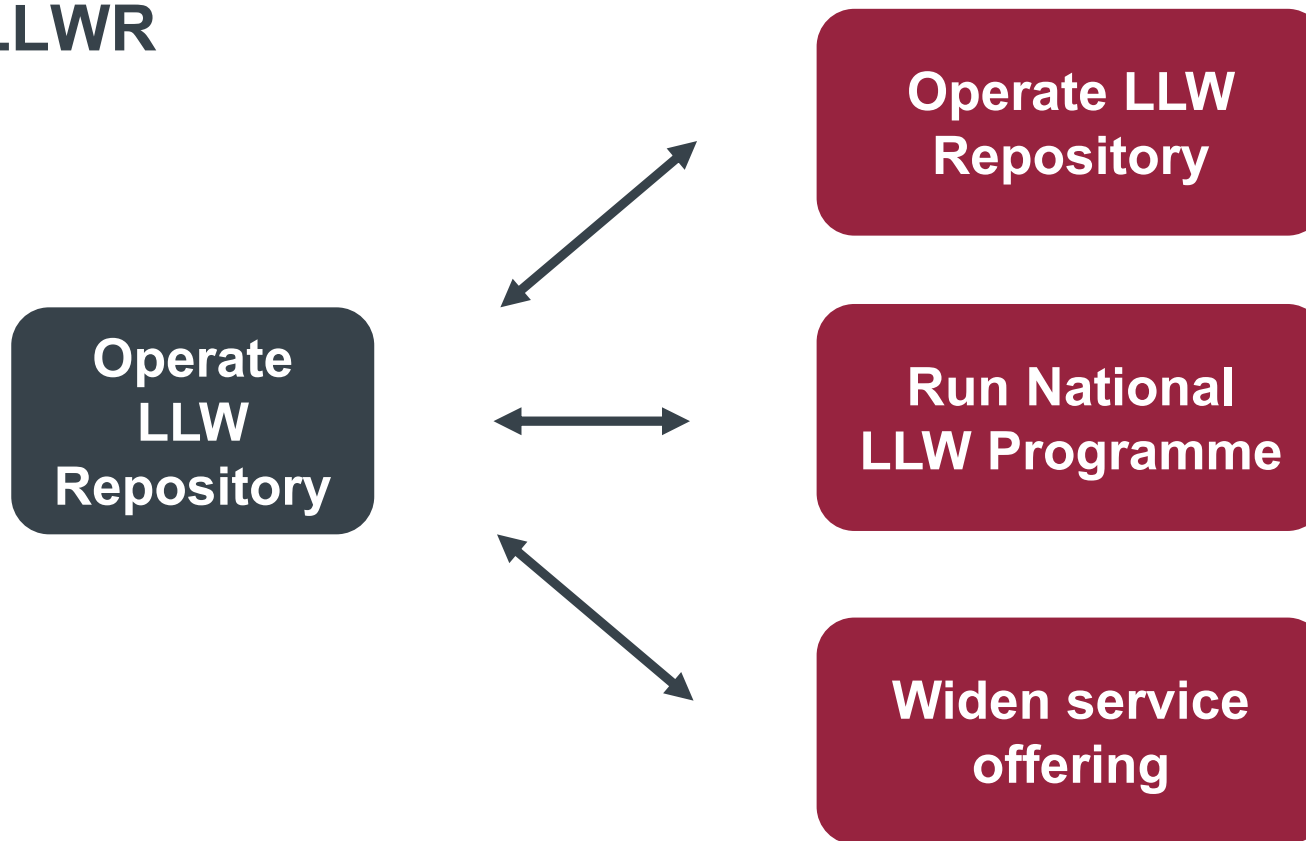
- **Cost**
- **Time**
- **Environmental Impact**
- **Regulatory and stakeholder pressures**
- **Lots of others...**

## **Influences...?**

- **supply chain involvement and development**
- **market forces**
- **economies of scale**
- **incentivisation through contracts and pricing**

# Support

LLWR



**Coordination**

# Support

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## National LLW Programme

- **Projects, activities, guidance**
- **Led by LLWR on NDA's behalf**
- **Monitor industry demand (JWMPs)**
- **Develop services accordingly**
- **Coordinate good practice sharing**



## Strategic BAT

Strategic level Best Available Technique (BAT) studies have been undertaken to determine and underpin the strategic decisions relating to waste treatment for VLLW, combustible waste and metallic waste. The BAT studies demonstrate systematic methodology involving technical, scientific qualitative and value for money judgements

- [Very Low Level Waste – Volume 1 \(PDF\)](#)
- [Very Low Level Waste -Volume 2 \(PDF\)](#)
- [Organic LLW National BAT Report\\_\(PDF\)](#)
- [Combustible Waste \(PDF\)](#)
- [Metallic Waste \(PDF\)](#)
- [Review of Strategic Options for Metallic Waste – 2011 \(PDF\)](#)

## Guidance Documents

- [Waste Management Hierarchy Guidance Document \(PDF\)](#)
- [Website on waste minimisation practices \(PDF\)](#)
- [LLW Segregation Guidance \(PDF\)](#)
- [On Site Disposal Business Case Guidance \(PDF\)](#)
- [Pond Furniture Strategic Guidance \(PDF\)](#)
- [Cross Boundary Waste Decision Making Guidance \(PDF\)](#)

## Technical Analysis Documents

Studies have been produced to support the development of best practices and to develop the baseline information available to support delivery of the NWP.

- [Independent Metal Decontamination Study \(PDF\)](#)
- [Consolidated R&D Recommendations for Hazardous and Orphan Wastes \(PDF\)](#)
- [Recycled Concrete Aggregate Stakeholder Dialogue \(PDF\)](#)
- [Transport Feasibility Study \(PDF\)](#)

## Training

We have developed e-learning modules to support Waste Consignors in the delivery of the UK Low Level Waste Strategy. For course registration details please contact the National Programme Office at [NWP@llwrsite.com](mailto:NWP@llwrsite.com)

# Support

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## LLWR Service offering

- **Characterisation**
- **Packaging**
- **Transport**
- **Metal treatment**
- **Combustible waste services**
- **Supercompaction**
- **Disposal at commercial landfill**
- **Disposal at LLWR**



**One contract**

# Support

## BAT Guidance

- “...the principles, processes and practices that should be used when identifying and implementing BAT for the management of radioactive waste”



## Best Available Techniques (BAT) for the Management of the Generation and Disposal of Radioactive Wastes

### A Nuclear Industry Code of Practice

This Nuclear Industry Code of Practice on Identifying and Implementing Best Available Techniques (BAT) was prepared on behalf of the Nuclear Industry Safety Directors Forum

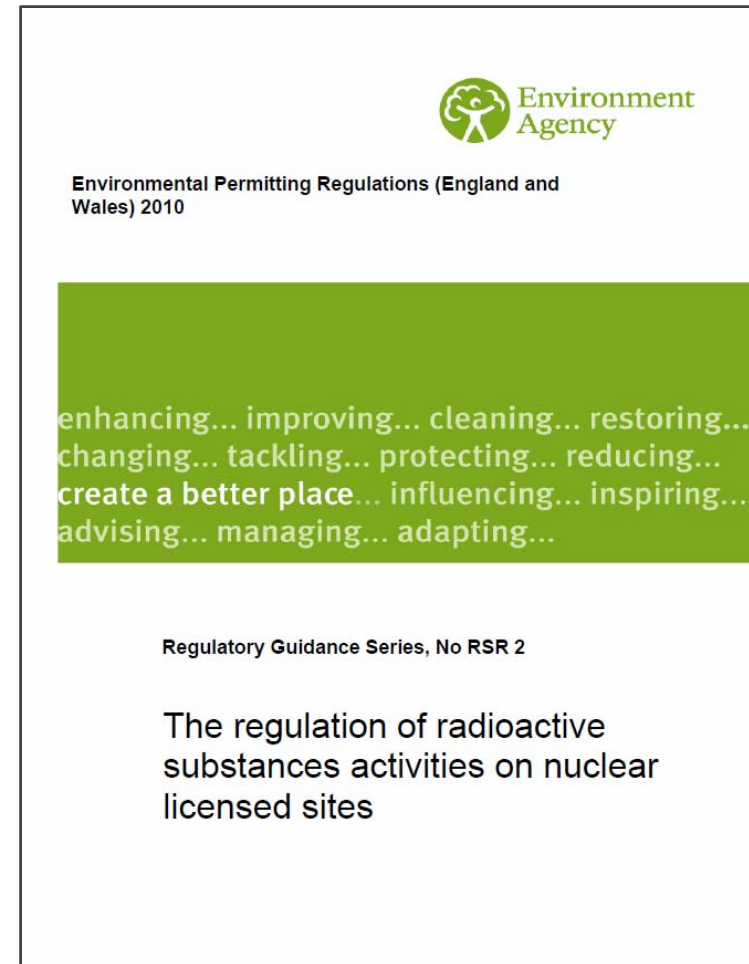
Issue 1  
December 2010



# Support

## Regulators

- **Amendments to permits / authorisations**
- **Engagement at programme level (in addition to site level)**
- **Guidance**
- **Communication**

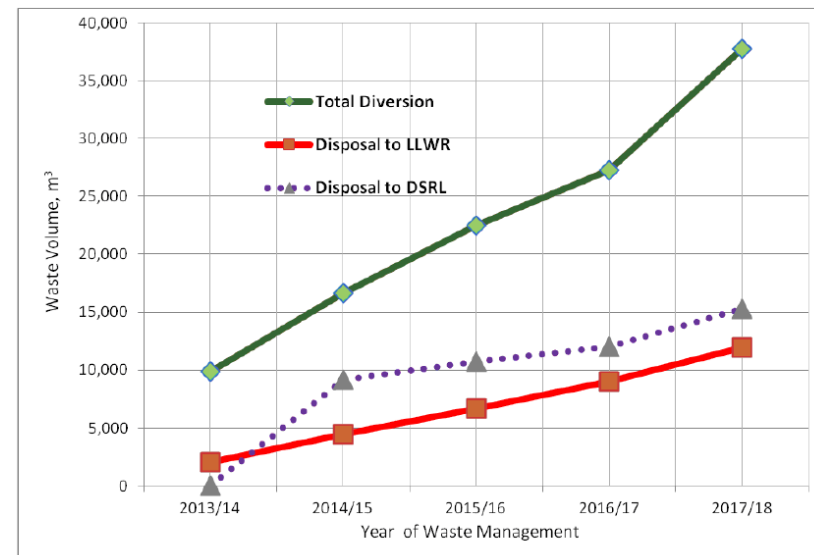


# Support

## Emphasis on planning

- Licence condition 35 – Decommissioning
- Lifetime Plan
- Integrated Waste Strategy
- Joint Waste Management Plan
- “Flywheel” projects

LLW Stream	2013
Metal (te)	2,922
Combustible (m <sup>3</sup> )	2,171
VLLW / LA-LLW (m <sup>3</sup> )	7,211
TOTAL DIVERSION (m <sup>3</sup> )	9,840
Disposal to LLWR (est. m <sup>3</sup> )	2,030
Disposal to DSRL near-site facility (est. m <sup>3</sup> )	30
TOTAL DISPOSAL (m <sup>3</sup> )	2,060
TOTAL LLW (m <sup>3</sup> )	15,691



# Integrated Decommissioning Waste Management

S-036, Issue 04  
March 2013



# IWS Action Plan

March 2013



# Sellafield and LLWR Joint Waste Management Plan

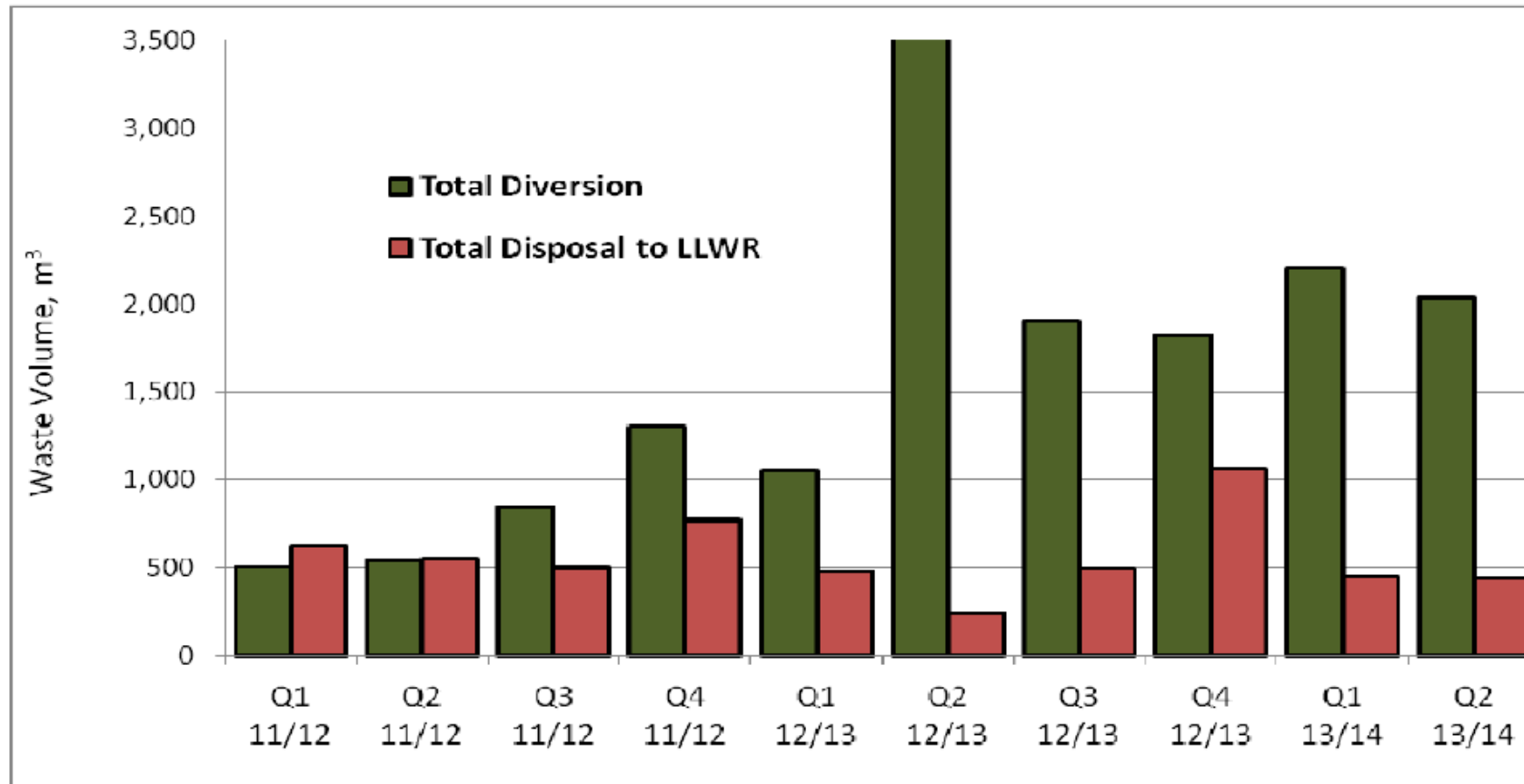
Issue: 5

Date: September 2013

Sellafield Document Ref: LLWSSG(11)04

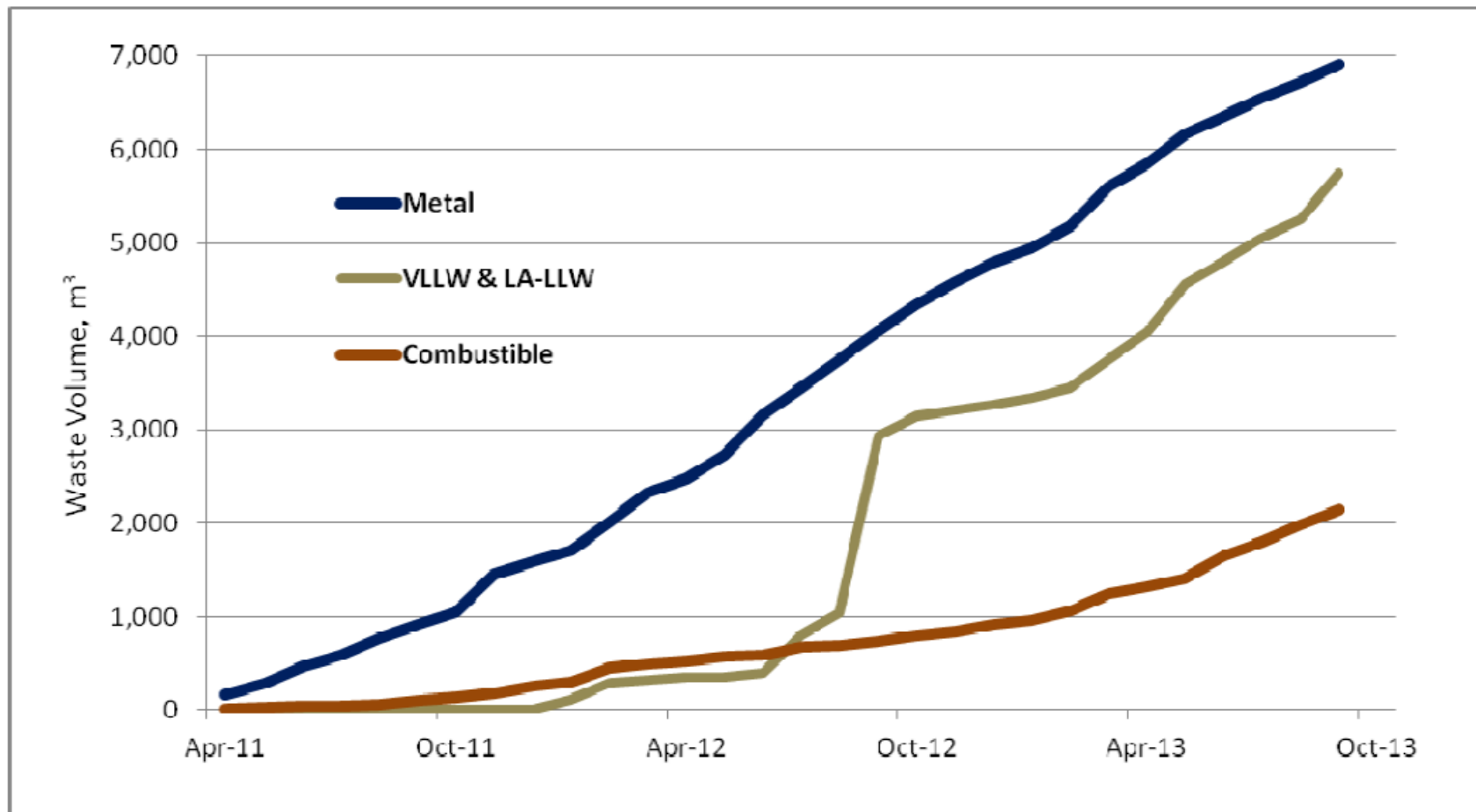


# Progress





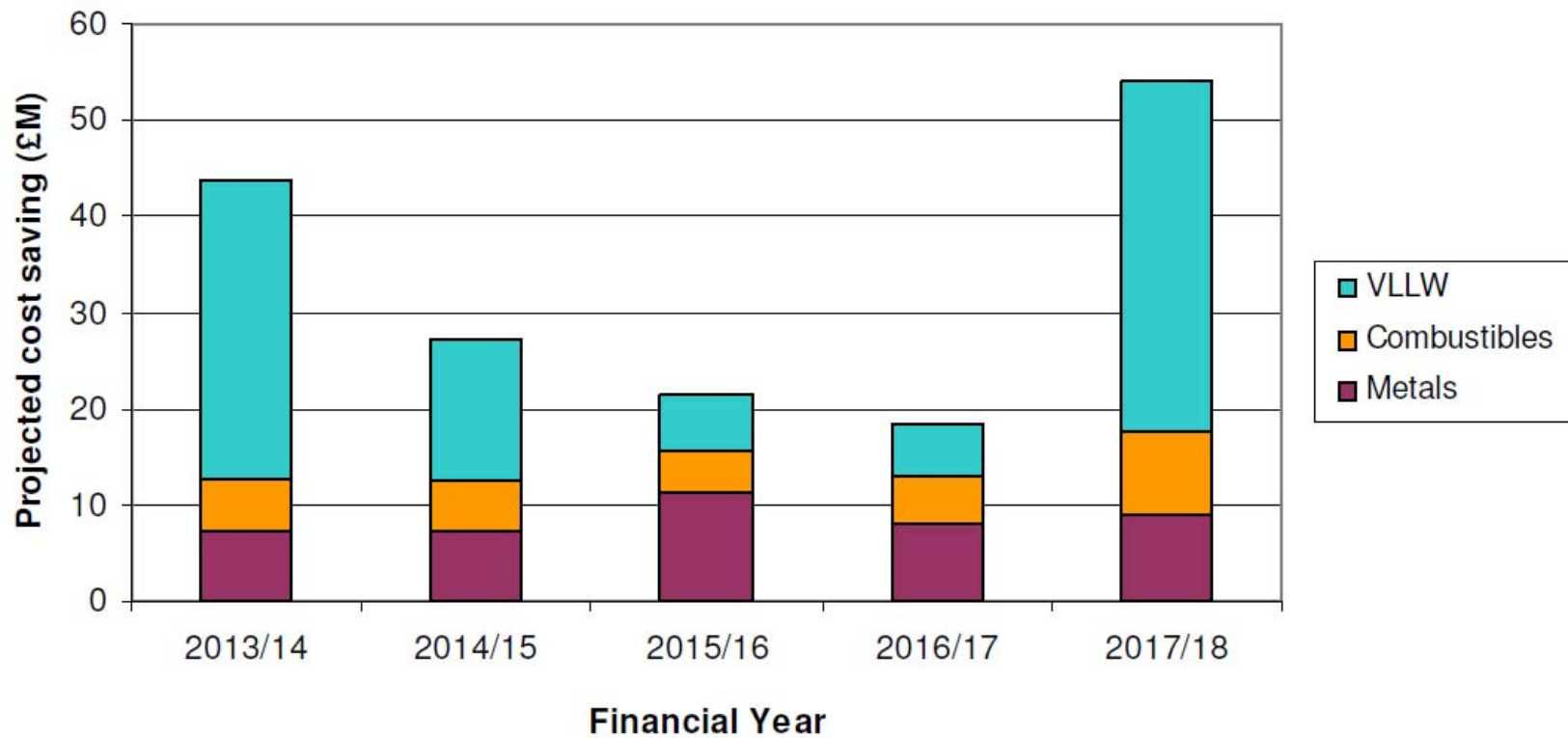
# Progress





# Progress

- Financial pressure...



# Progress

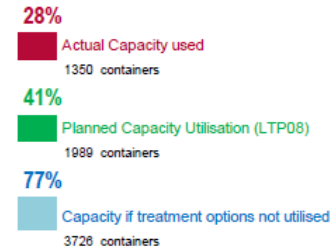
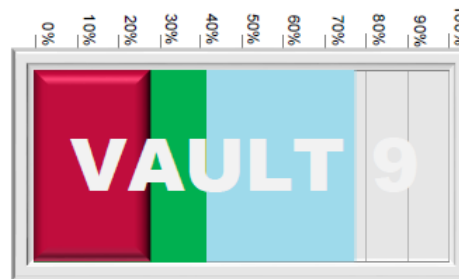
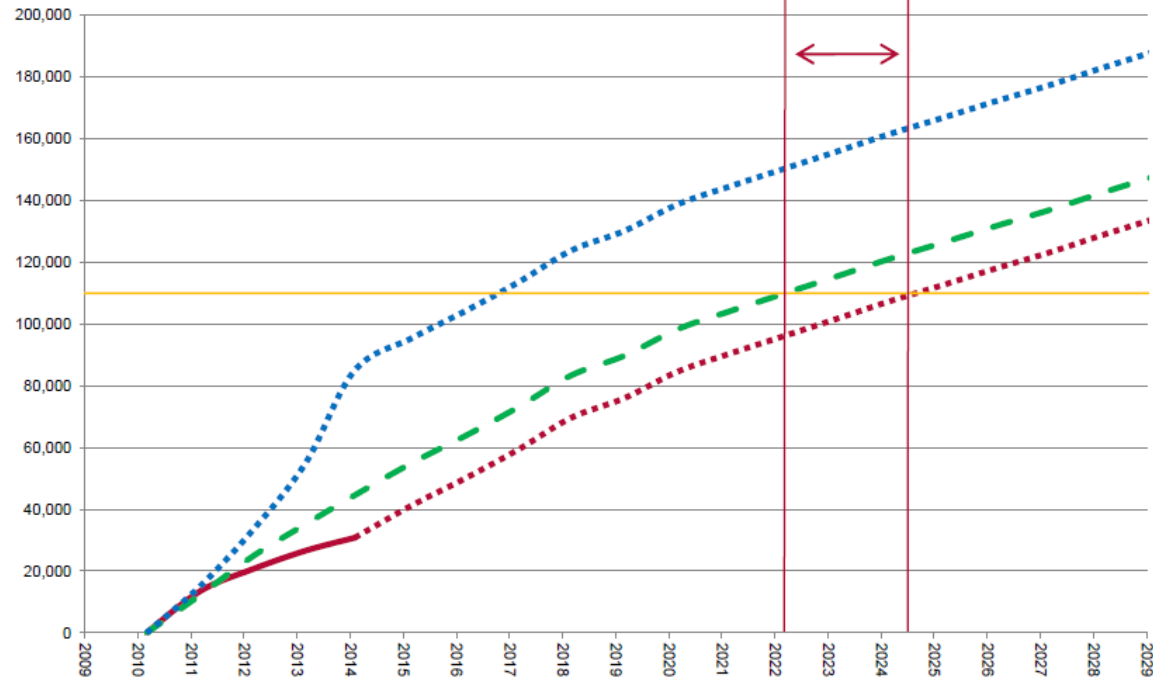
- Disposal capacity availability

V9

## Actual vs Forecast Volumes



**+2.5** Year extension based on forecast from actual disposals



View of vault 9

This graph compares the actual vault capacity used, against the planned capacity according to LTP08 and the capacity that would have been used if no treatment options were utilised. This graph is based on data from the past calendar year. These values assume all waste consigned to LLWR since FY 10/11 was for storage in vault 9, and all waste diverted since FY 10/11 would have been stored in vault 9. For metallic wastes it has been assumed that 10te is contained within a HHISO.

# Thank you!



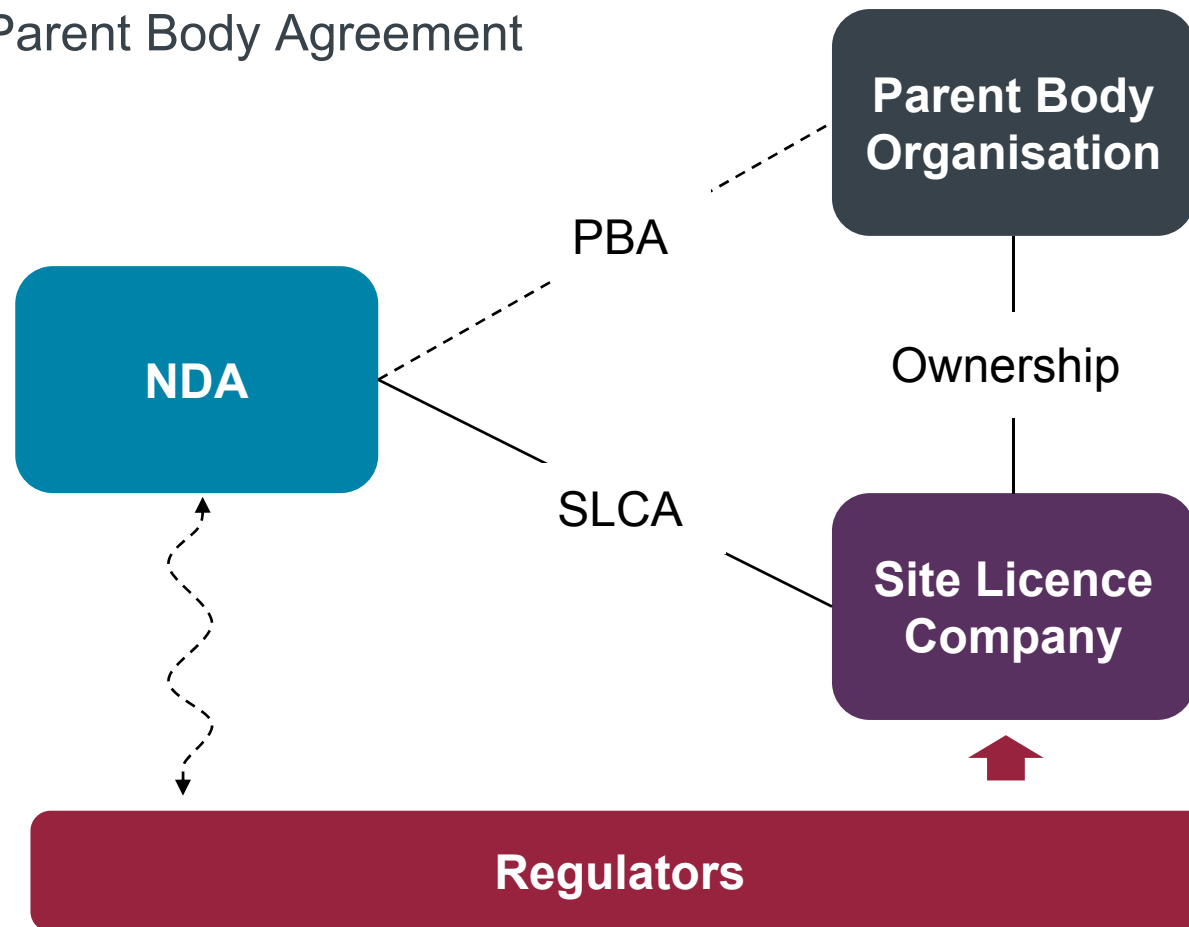
NDA

Nuclear  
Decommissioning  
Authority

# Reserve slide 1

SLCA = Site Licence Company Agreement

PBA = Parent Body Agreement



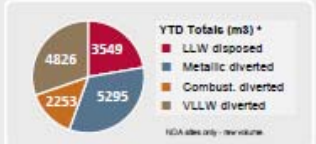


# February 2014 Waste Metric Dashboard

Period 11: 26th January to 22nd February FY 13/14

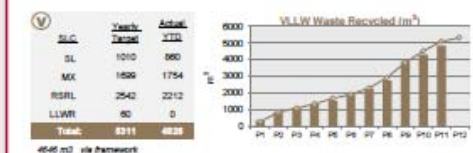
## UK Waste Diversion

The National Waste Programme aims to communicate progress in the implementation of the Waste Hierarchy and the Nuclear Industry Strategy for Low Level Waste Management across the UK. This dashboard shows key metrics that demonstrate the successful diversion of waste away from direct disposal and the optimal use of key national assets, such as LLWR and waste treatment facilities on sites around the UK, based on delivery of Joint Waste Management Plans (JWMPs). The objective is to encourage transparency and communicate progress to all stakeholders.



## Metallic, Combustible and Very Low Level Waste

FY2013/14 Summary - Period 11\*\*  
These graphs are a summary of the cumulative progress to date against the combined JWMP targets. NB These numbers do not capture VLLW disposed of on site and Non NDA waste diversion. Non NDA waste diversion is captured in the box below.



### Sellafield Ltd

**JWMP Targets 2013/14**

These graphs show the cumulative actual waste diverted by Sellafield Ltd against their JWMP targets.

**Metallic Recycling**

Yearly Target	Actual YTD	
Onsite treatment	801	1127
Via framework	700	800
Out of Scope	0	0
<b>Total</b>	<b>1501</b>	<b>1927</b>

**Combustible Recycling**

Yearly Target	Actual YTD	
Onsite treatment	0	0
Via framework	300	275
Out of Scope	0	0
<b>Total</b>	<b>300</b>	<b>275</b>

**VLLW Recycling**

Yearly Target	Actual YTD	
Onsite treatment	3791	0
Via framework	1010	860
Out of Scope	0	0
<b>Total</b>	<b>4801</b>	<b>860</b>

\* Target only applied to VLLW via the framework

### Magnox Ltd

**JWMP Targets 2013/14**

These graphs show the cumulative actual waste diverted by Magnox Ltd against their JWMP targets.

**Metallic Recycling**

Yearly Target	Actual YTD	
Onsite treatment	194	20
Via framework	505	425
Out of Scope	0	229
<b>Total</b>	<b>779</b>	<b>674</b>

**Combustible Recycling**

Yearly Target	Actual YTD	
Onsite treatment	80	80
Via framework	1474	1544
Out of Scope	0	16
<b>Total</b>	<b>1642</b>	<b>1731</b>

**VLLW Recycling**

Yearly Target	Actual YTD	
Onsite treatment	0	0
Via framework	1191	1574
Out of Scope	508	180
<b>Total</b>	<b>1699</b>	<b>1754</b>

### RSRL

**JWMP Targets 2013/14**

These graphs show the cumulative actual waste diverted by Research Sites Restoration Ltd against their JWMP targets.

**Metallic Recycling**

Yearly Target	Actual YTD	
Onsite treatment	31	54
Via framework	101	56
Out of Scope	0	0
<b>Total</b>	<b>132</b>	<b>110</b>

**Combustible Recycling**

Yearly Target	Actual YTD	
On site disposal	0	0
Via framework	254	247
Out of Scope	0	0
<b>Total</b>	<b>254</b>	<b>247</b>

**VLLW Recycling**

Yearly Target	Actual YTD	
Onsite treatment	0	0
Via framework	2542	2212
Out of Scope	0	0
<b>Total</b>	<b>2542</b>	<b>2212</b>

### LLWR Ltd

**JWMP Targets 2013/14**

These graphs show the cumulative actual waste diverted by Low Level Waste Repository Ltd against their JWMP targets.

**Metallic Recycling**

Yearly Target	Actual YTD	
Onsite treatment	0	0
Via framework	12	0
Out of Scope	0	4
<b>Total</b>	<b>12</b>	<b>4</b>

**Combustible Recycling**

Yearly Target	Actual YTD	
On site disposal	0	0
Via framework	0	0
Out of Scope	0	0
<b>Total</b>	<b>0</b>	<b>0</b>

**VLLW Recycling**

Yearly Target	Actual YTD	
Onsite treatment	0	0
Via framework	80	0
Out of Scope	0	0
<b>Total</b>	<b>80</b>	<b>0</b>



### Non NDA sites

Diversion totals from Non-NDA sites (YTD) \*\*\*

Site	AME	EP Group	CNS	French	UK/NEC	OE	Others
(B)	0	71	0	183	0	0	0 (t)
(C)	0	0	0	0	0	0	0 (m3)
(S)	59	218	0	91	0	0	0 (m3)
<b>Totals</b>	<b>59</b>	<b>289</b>	<b>0</b>	<b>183</b>	<b>0</b>	<b>0</b>	<b>0</b>



### LLW Disposed

This table gives the no. of containers disposed of at the LLWR facility each Period.

No. of containers	Per11	Per12	Per13	Per14	Per15	Per16	Per17	Per18	Per19	Per20	Per21	Per22
SL	0	0	0	0	0	0	0	0	0	0	0	0
MX	4	0	0	0	0	0	0	0	0	0	0	0
DSRL*	4	0	0	0	0	0	0	0	0	0	0	0
RSRL	4	0	0	0	0	0	0	0	0	0	0	0
LLWR	0	0	0	0	0	0	0	0	0	0	0	0
Others**	0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

\* Containers stored at DSRL. \*\* Others include Non-NDA sites.

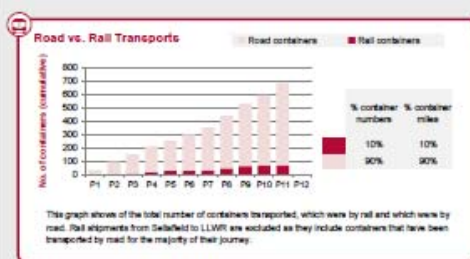
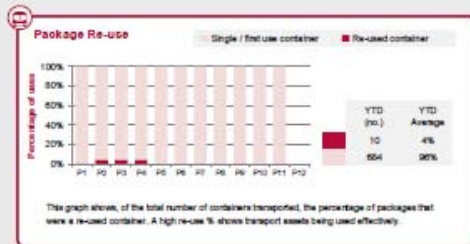
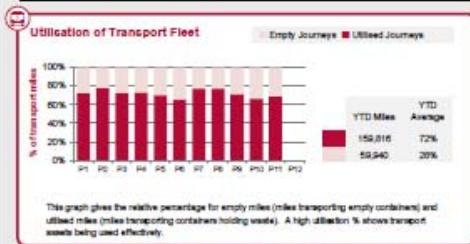
**Footnotes**

\*Metallic waste has been converted to raw volume assuming 10% per Half Height Isotone container (HHISO) and a HHISO volume of 19.2m<sup>3</sup>. The same volume has been used to convert LLWR container numbers to raw volumes.

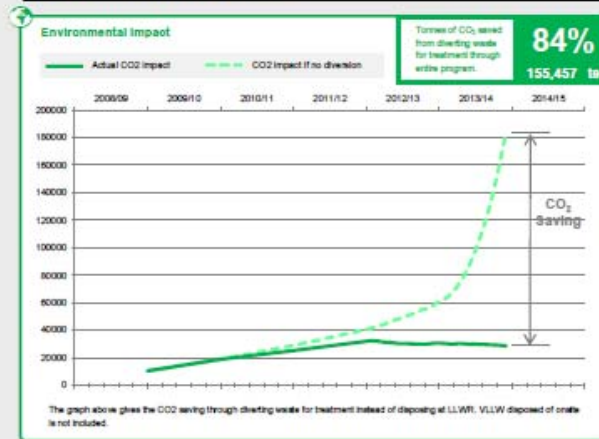
\*\*Dashboards generated from Period 7 onwards include the updated target from the LLWR JWMP 5 submissions.

\*\*\* Debris from Non NDA include framework and non framework diversions

**Transport and Packaging**



**Safety Environment and Assurance**



### RIDDOR/OSHA

RIDDOR and OSHA are measures of reporting safety incidents.

Quarter in FY 13/14	Q1	Q2	Q3	Q4
Transport RIDDOR	0	0	0	0
Repository RIDDOR	0	0	0	0
Repository OSHA (TRIR) <sup>1</sup>	0	0	0	0

<sup>1</sup> % of RIDDOR (no single employee) (3/10/13)  
<sup>2</sup> % of incidents (no. of hours worked) (20/1/13)

\* Quarter 4 figures as at the end of fiscal 11. \*\* TRIR (Total recordable incident rate)

### Supply Chain Non Conformance

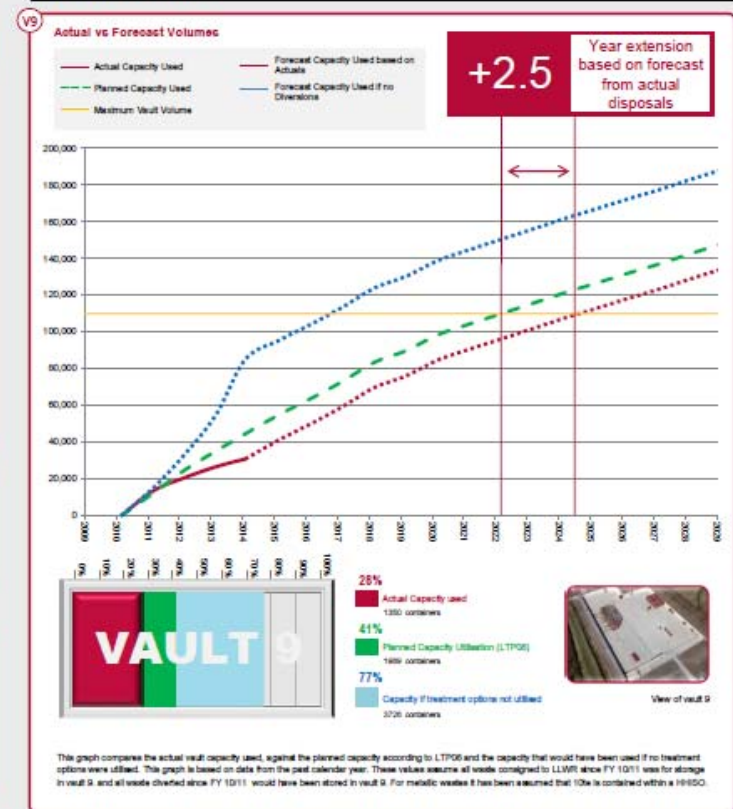
No. of non-conformances YTD: **53**

Average no. of non-conformances YTD: **4.8**

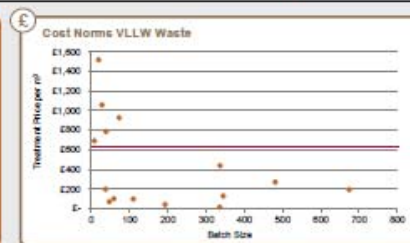
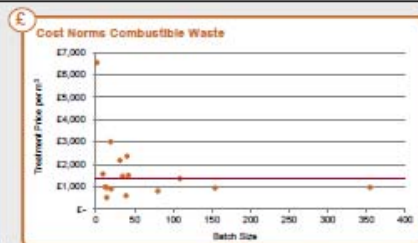
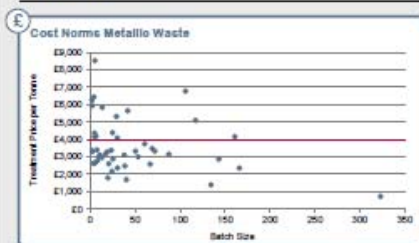
Period	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12
No. of supply chain non-conformances	14	6	6	0	0	2	4	3	1	3	0	0

This table reflects the number of reported non-conformances within the supply chain on a monthly basis.

**LLWR Vault 9 Capacity**



**Cost Norms**



**National Waste Programme | Key Achievements This Quarter**

- Quarter 3 Milestones 2013/2014**
- Review of environmental permits across all Magnox sites (Magnox)
  - Complete LLW Fingerprint Review (Magnox)
  - Undertake aggregated WEF for metallic wastes (Magnox)
  - Alternative HHSO Project: Fabricate prototype concrete HHSOs for testing (DSRL)

- Quarter 4 Milestones 2013/2014**
- Implement Combustible waste route as business as usual (SL)
  - Work with Regulators and NDA to define site end state for Wrinth (RSRL)
  - Re-compete Metals, Combustibles and Supercompaction framework (LLWR)
  - Transfer inventory Data to eMWaste tracking tool (Magnox)

**Usage of Waste Routes - NDA SLC's**

This table shows the routes available to each of the sites, which have been utilised and which are yet to be utilised. This data is reflective of waste route usage from 2006 to the YTD.

SLC	Site	Metallic Waste	Combustible Waste	LLW	VLLW / LALLW
Sellafield Ltd	Sellafield	●	●	●	●
	Barnsley	●	●	●	●
	Gravelly	●	●	●	●
	Chapelcross	●	●	●	●
	Dunfermline A	●	●	●	●
	Hillside Point A	●	●	●	●
	Hunterston A	●	●	●	●
	Oldbury	●	●	●	●
Magnox Ltd	Stowell A	●	●	●	●
	Tranwellford	●	●	●	●
	Wylfa	●	●	●	●
	Wylfa B	●	●	●	●
RSRL	Harwell	●	●	●	●
	Warrington	●	●	●	●
LLWR	LLWR	●	●	●	●
DSRL	Donway	●	●	●	●

**Key:**  
 ● Route not open  
 ● Route available  
 ● Route in use  
 ■ Recent status change