

SITE	Sellafield
SITE OWNER	Nuclear Decommissioning Authority
WASTE CUSTODIAN	Sellafield Ltd
WASTE TYPE	LLW

Stocks:
Future arisings:

	Reported (m ³)	OR	Conditioned (m ³)	Packaged (m ³)
At 1.4.2025				
1.4.2025 - 31.3.2028	= 0			
1.4.2028 - 31.3.2029	< 0.1			
1.4.2029 - 31.3.2030	= 4.7			
1.4.2030 - 31.3.2031	= 4.9			
1.4.2031 - 31.3.2032	= 4.9			
1.4.2032 - 31.3.2033	= 0.2			
1.4.2033 - 31.3.2034	= 0.1			
1.4.2034 - 31.3.2035	= 0.1			
1.4.2036 - 31.3.2037	= 14.5			
1.4.2037 - 31.3.2038	= 28.9			
1.4.2040 - 31.3.2041	= 12.8			
1.4.2041 - 31.3.2042	= 14.3			
1.4.2042 - 31.3.2043	= 29.4			
1.4.2043 - 31.3.2047	= 55.8			
1.4.2047 - 31.3.2052	= 236.6			
1.4.2052 - 31.3.2055	= 100.1			
1.4.2055 - 31.3.2056	= 37.7			
1.4.2056 - 31.3.2057	= 64.1			
1.4.2057 - 31.3.2058	= 80.6			
1.4.2058 - 31.3.2059	= 134.6			
1.4.2059 - 31.3.2060	= 118.1			
1.4.2060 - 31.3.2061	= 147.3			
1.4.2061 - 31.3.2062	= 119.0			
1.4.2062 - 31.3.2063	= 135.7			
1.4.2063 - 31.3.2064	= 144.4			
1.4.2064 - 31.3.2065	= 134.6			
1.4.2065 - 31.3.2067	= 89.3			
1.4.2094 - 31.3.2108	= 968.5			

Total future arisings:	2681.1
Total waste volume:	2681.1

Number of waste packages in stock: At 1.4.2025..... - packages

Comment on arising rates: Arisings are based on a number of decommissioning projects that will commence on different dates.

Additional information on quantities: Waste within this waste stream is generated from a number of decommissioning projects which will commence at a future date. As a result of this, minimal characterisation of waste volumes and fingerprints has been carried out and hence there is a large uncertainty in the potential arisings. Preliminary assessments indicate that the volumes may vary from -50% to +300% for LLW.

Uncertainty factors on	Stock (upper):	x -	Arisings (upper):	x 4.00
volumes:	Stock (lower):	x -	Arisings (lower):	x 0.50

WASTE SOURCE	Dismantling of spent fuel storage ponds and associated facilities.
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General description: Plant and equipment, instruments and fittings, internal building fabric, soft waste ie. rubber, PVC, paper. Most items size reduced in-situ. Some large items may be present.

Changes since waste generated: -

Bulk density (t/m³): ~ 0.50

Comment on density: Density stated is an average for raw LLW generated at building workplace.

General description and components (%wt): Stainless steel (33%), mild steel (48%), copper (<4%), aluminium (1%), zinc (<0.05%), plastic (10%), rubber (2%), glass (1%), cellulose (1%). Percentages are by volume.

Chemical state: Neutral

Sheet metal proportion / thickness: Some sheet metal present (~30%), bulk metal (70%).

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	= 33.0	The most commonly used stainless steel is 304L. Ni is present in this at 9-12% by weight.	
Other ferrous metals.....	= 48.0		
Iron.....	TR		
Aluminium.....	= 1.0		
Beryllium.....	= 0		
Cobalt.....	= 0		
Copper.....	< 4.0		
Lead.....	TR		
Magnox/Magnesium.....	= 0		
Nickel.....	= 0		
Titanium.....	= 0		
Uranium.....	TR		
Zinc.....	< 0.05		
Zircaloy/Zirconium.....	= 0		
Other metals.....	= 0		

Organics (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulotics.....	= 1.0		
Paper, cotton.....	TR		
Wood.....	~ 1.0		
Halogenated plastics.....	= 7.5		
Total non-halogenated plastics.....	= 2.5		
Condensation polymers.....	= 1.3		
Others.....	= 1.3		
Organic ion exchange materials.....	= 0		
Total rubber.....	= 2.0		
Halogenated rubber.....	P		
Non-halogenated rubber.....	P		
Hydrocarbons.....	-		
Oil or grease.....	-		
Fuel.....	-		
Asphalt/Tarmac (cont.coal tar).....	-		
Asphalt/Tarmac (no coal tar).....	-		
Bitumen.....	-		
Others.....	-		
Other organics.....	= 0		

Other materials (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Inorganic ion exchange materials.....	= 0	Asbestos is likely to be present in lagging and gaskets but the specific types and proportions have not been determined.	
Inorganic sludges and flocs.....	TR		
Soil.....	= 0		
Brick/Stone/Rubble.....	TR		
Cementitious material.....	TR		
Sand.....	= 0		
Glass/Ceramics.....	= 1.0		
Graphite.....	= 0		
Desiccants/Catalysts.....	P		
Asbestos.....	P		
Non/low friable.....	-		
Moderately friable.....	-		
Highly friable.....	-		
Free aqueous liquids.....	= 0		
Free non-aqueous liquids.....	= 0		
Powder/Ash.....	= 0		

COMPONENTS OF MATERIALS, WASTE PROPERTIES, MATERIALS NOT CONTRIBUTING TO MASS

Inorganic anions (%wt):

	(%wt)	Type(s) and comment
Fluoride.....	= 0	
Chloride.....	= 0	
Iodide.....	= 0	
Cyanide.....	= 0	
Carbonate.....	= 0	
Nitrate.....	= 0	
Nitrite.....	= 0	
Phosphate.....	= 0	
Sulphate.....	= 0	
Sulphide.....	= 0	

Materials of interest for waste acceptance criteria:

	(%wt)	Type(s) and comment
Combustible metals.....	= 0	-
Low flash point liquids.....	= 0	-
Explosive materials.....	= 0	-
Phosphorus.....	= 0	-
Hydrides.....	= 0	-
Biological etc. materials.....	= 0	-
Biodegradable materials.....	TR	-
Putrescible wastes.....	TR	Trace.
Non-putrescible wastes.....	= 0	-
Corrosive materials.....	= 0	-
Pyrophoric materials.....	= 0	-
Generating toxic gases.....	= 0	-
Reacting with water.....	= 0	-
Higher activity particles.....	= 0	-
Soluble solids as bulk chemical compounds.....	= 0	-

Hazardous substances / non hazardous pollutants:

	(%wt)	Type(s) and comment
Acrylamide.....	-	-
Benzene.....	-	-
Chlorinated solvents.....	-	-
Formaldehyde.....	-	-
Organometallics.....	-	-
Phenol.....	-	-
Styrene.....	-	-
Tri-butyl phosphate.....	-	-
Other organophosphates.....	-	-
Vinyl chloride.....	-	-
Arsenic.....	-	-
Barium.....	-	-
Boron.....	-	-
Boron (in Boral).....	-	-
Boron (non-Boral).....	-	-
Cadmium.....	-	-
Caesium.....	-	-
Selenium.....	-	-
Chromium.....	-	-
Molybdenum.....	-	-
Thallium.....	-	-
Tin.....	-	-
Vanadium.....	-	-
Mercury compounds.....	-	-
Others.....	-	-

Complexing agents (%wt):

	(%wt)	Type(s) and comment
EDTA.....	-	-
DPTA.....	-	-
NTA.....	-	-
Polycarboxylic acids.....	-	-
Other organic complexants.....	-	-
Total complexing agents.....	= 0	-

Physical components:

	Number	Type(s) and comment
Sources.....	= 0	-
Electronic & Electrical Equipment (EEE)		
EEE Type 1.....	NE	-
EEE Type 2.....	NE	-
EEE Type 3.....	NE	-
EEE Type 4.....	NE	-
EEE Type 5.....	NE	-

TREATMENT, PACKAGING AND DISPOSAL

Planned on-site / off-site treatment(s):

Treatment	On-site / Off-site	Stream volume %
Size reduction	Off-site	10.0
Decay storage		
Low force compaction		
Supercompaction (HFC)		
Incineration		
Drying/dewatering/liquid separation	Off-site	72.0
Tie down/fixatives/strippable coating/painting application		
Decontamination		
Metal treatment		
Recycling / reuse		
Thermal treatment, including vitrification		18.0
Encapsulation		
Polymer encapsulation		
Other physical treatment		
Other chemical treatment		
Containerisation		
Treatment not yet determined		
None		

Comments on planned treatments:

Although there are no firm plans in place, based on current experience we have assumed the treatment methods set out in the table for the purposes of the 2025 UK Inventory. For Inventory purposes, it is assumed that part of this stream will be deemed acceptable for incineration.

Conditioning method:

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Conditioning plants:

Plant Name	Location

Likely conditioning matrix:

-

Further information on the conditioning matrix:

-

Waste Packaging:

Likely container type:

Container	Waste packaged (vol%)	Waste loading (m³)	Payload (m³)	Number of packages	Estimated start date for packaging
1/2 Height IP-2 Disposal/Re-usable ISO (TC01/TC02)	18.0	15.7	18.3	31	-

Range in container waste loading:

Other information on packaging and conditioning:

-

Conditioned density (t/m³):

-

Conditioned density comment:

-

Management Routes:

Disposal Route	Stream volume %	Raw density t/m³	Start date
Expected to be consigned to a Near Site, Near Surface Disposal Facility (Scotland)	= 18.0	= 1.2	
Expected to be Non-NSD HAW managed under Scottish Government's policy			
Expected to be disposed to LLW Vaults NRS Dounreay			
Expected to be consigned to the Geological Disposal Facility			
Expected to be consigned to a Near Surface Disposal Facility			
Expected to be consigned to the LLW Repository	= 10.0	= 0.14	
Expected to be consigned to a Landfill Facility			
Expected to be disposed On-Site	= 72.0	= 1.4	
Expected to be managed by In-Situ Disposal			
Expected to be consigned to an Incineration Facility	= 72.0	= 1.4	
Expected to be consigned to a Metal Treatment Facility			
Expected to be Out of Scope			
Expected to be recycled / reused			
Disposal route not known			

Classification codes for waste expected to be consigned to a landfill facility:

Opportunities for alternative disposal routing: Not yet determined

Baseline Management Route	Opportunity Management Route	Stream volume (%)	Opportunity Confidence	Comment
-	-	-	-	-

RADIOACTIVITY

Source: The main sources of activity are actinides and fission products.

Uncertainty: Waste within this waste stream is generated from a number of decommissioning projects which will commence at a future date. The uncertainties quoted for each nuclide represent both the uncertainty in quantification without detailed sampling and the likely variation of nuclides in different buildings consigned wastes under this waste stream. It is exceptionally unlikely that all the waste included in this waste stream will have the same variation in nuclide fingerprint.
Also activity levels will depend on degree of decontamination achieved.

Measurement of radioactivities: Future arisings activities are based on actual activities of similar recent disposals.

Chemical form of radionuclides: H-3: The chemical form of tritium has not been determined.
C-14: The chemical form of carbon has not been determined.
Cl-36: Not expected to be present in significant quantity.
Se-79: Not expected to be present in significant quantity.
Tc-99: Not expected to be present in significant quantity.
I-129: Not expected to be present in significant quantity.
Ra: Not expected to be present in significant quantity.
Th: Not expected to be present in significant quantity.
U: Not expected to be present in significant quantity.
Np: The chemical form of Neptunium has not been determined.
Pu: The chemical form of Plutonium has not been determined.

WASTE STREAM		2D108		Miscellaneous Plants Initial/Interim Decommissioning: Ponds							
Nuclide	Mean radioactivity, TBq/m³				Nuclide	Mean radioactivity, TBq/m³					
	Waste at 1.4.2025	Bands and Code	Future Arisings	Bands and Code		Waste at 1.4.2025	Bands and Code	Future Arisings	Bands and Code		
H 3			~ 1.50E-10	C C 2	Gd 153						
Be 10				8	Ho 163						
C 14			~ 1.06E-08	C C 2	Ho 166m						
Na 22					Tm 170						
Al 26					Tm 171						
Cl 36				8	Lu 174						
Ar 39					Lu 176						
Ar 42					Hf 178n						
K 40					Hf 182						
Ca 41				8	Pt 193						
Mn 53			8	Tl 204							
Mn 54			8	Pb 205							
Fe 55			8	Pb 210				8			
Co 60			~ 3.33E-07	C C 2	Bi 208						
Ni 59			8	Bi 210m							
Ni 63			8	Po 210						8	
Zn 65			8	Ra 223							
Se 79			8	Ra 225							
Kr 81				Ra 226						8	
Kr 85				Ra 228							
Rb 87				Ac 227							
Sr 90			~ 8.30E-05	C C 2	Th 227						
Zr 93				8	Th 228						
Nb 91			Th 229				8				
Nb 92			Th 230				8				
Nb 93m		8	Th 232				8				
Nb 94		8	Th 234								
Mo 93		8	Pa 231				8				
Tc 97			Pa 233								
Tc 99			8	U 232							
Ru 106			~ 6.39E-06	C C 2	U 233						
Pd 107			8	U 234						8	
Ag 108m			8	U 235						8	
Ag 110m				U 236						8	
Cd 109				U 238						8	
Cd 113m				Np 237	~ 4.38E-09					C C 2	
Sn 119m				Pu 236							
Sn 121m				Pu 238	~ 1.19E-08					C C 2	
Sn 123				Pu 239	~ 3.89E-07					C C 2	
Sn 126				Pu 240	~ 1.18E-07					C C 2	
Sb 125		Pu 241	~ 1.59E-06	C C 2							
Sb 126		Pu 242		8							
Te 125m		Am 241	~ 2.73E-07	C C 2							
Te 127m		Am 242m		8							
I 129		Am 243		8							
Cs 134			~ 3.45E-07	C C 2	Cm 242						
Cs 135			8	Cm 243						8	
Cs 137			~ 2.05E-04	C C 2	Cm 244						8
Ba 133				Cm 245						8	
La 137				Cm 246						8	
La 138				Cm 248							
Ce 144			~ 3.44E-06	C C 2	Cf 249						
Pm 145				Cf 250							
Pm 147				Cf 251							
Sm 147				Cf 252							
Sm 151		Unsp a		8							
Eu 152	~ 9.61E-10	C C 2	Unsp b/g	~ 1.00E-05	C C 2						
Eu 154	~ 7.33E-09	C C 2	Total a	7.96E-07	*						
Eu 155	~ 3.62E-09	C C 2	Total b/g	0	*	3.10E-04	*				

Bands (Upper and Lower)

A a factor of 1.5
B a factor of 3
C a factor of 10
D a factor of 100
E a factor of 1000

Note: Bands quantify uncertainty in the mean radioactivity.

Code

1 Measured activity
2 Derived activity (best estimate)
3 Derived activity (upper limit)
4 Not present
5 Present but not significant
6 Likely to be present but not assessed
7 Present in significant quantities but not determined
8 Not expected to be present in significant quantity
* Total calculated from the 114 declared radionuclides