

WASTE STREAM	2Y57	Low Level Waste (LLW) Onsite Landfill
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SITE Sellafield

SITE OWNER Nuclear Decommissioning Authority

WASTE CUSTODIAN Sellafield Ltd

WASTE TYPE LLW

WASTE VOLUMES

	Reported (m ³)	OR	Conditioned (m ³)	Packaged (m ³)
Stocks:	At 1.4.2025	= 0		
Future arisings:	1.4.2025 - 31.3.2026	4857.0		
	1.4.2026 - 31.3.2027	4857.0		
	1.4.2027 - 31.3.2028	4857.0		
	1.4.2028 - 31.3.2029	4857.0		
	1.4.2029 - 31.3.2030	4857.0		
	1.4.2030 - 31.3.2031	4857.0		
	1.4.2031 - 31.3.2032	4857.0		
	1.4.2032 - 31.3.2033	4857.0		
	1.4.2033 - 31.3.2034	4857.0		
	1.4.2034 - 31.3.2035	4857.0		
	1.4.2035 - 31.3.2036	4857.0		
	1.4.2036 - 31.3.2037	4857.0		
	1.4.2037 - 31.3.2038	4267.0		
Total future arisings:	62551.0			
Total waste volume:	62551.0			

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

Comment on arising rates: Arisings compiled from predominantly excavated spoil from construction and demolition concrete / rubble, with smaller amounts of putrescible wastes including roof waste [vegetation], timber, sewage solids, road sweepings and in very few cases, bird / animal carcasses. From the historical arisings, the average annual volume of waste disposed at CLESA was calculated at 4857m³ and was used as the annual arising volume for each year until the capacity of CLESA (including the proposed CLESA valley extension) was reached (144,000 m³) from 2025 through 2037. During the year of 2037, 4267m³ of waste will be required to be disposed of to reach the volume capacity limit for CLESA. The average of 4857m³ does not include the data for 2020 as the Covid-19 pandemic caused a significant reduction in waste disposals on site that year.

Additional information on quantities: Due to the arisings for 2Y57 being based on the remaining volume in CLESA, the upper and lower uncertainties will be set at 1 for the total volume of arisings. The uncertainty value of 1, i.e. no uncertainty, is because it is expected that the whole of the remaining CLESA waste volume will be filled with waste.

Uncertainty factors on volumes: Stock (upper): x - Arisings (upper): x 1.00
Stock (lower): x - Arisings (lower): x 1.00

WASTE SOURCE This waste stream is predominantly excavated spoil from construction and demolition concrete / rubble, with smaller amounts of putrescible wastes including roof waste [vegetation], timber, sewage solids, road sweepings and in very few cases bird/animal carcasses.

PHYSICAL CHARACTERISTICS

General description: All waste will be "tipped" or emplaced in the disposal facility (as per facility Conditions For Acceptance (CFA)). No disposal containers are used.

Changes since waste generated: The only physical/chemical processes applied to the waste are crushing (concrete/demolition rubble) and dewatering in the case of sewage/road sweepings.

Bulk density (t/m³): = 2.0

Comment on density: The bulk density ranges from 0.05 to 2.4 t/m³.

CHEMICAL COMPOSITION

General description and components (%wt): Miscellaneous construction and demolition materials (95.81%), Organic Materials (3.6%), Insulation Materials (MMMF) (0.35%), Mixed Municipal Wastes (0.13%), and Wood (0.15%).

Chemical state: -

Sheet metal proportion / thickness: Mild steel present in the form of reinforcing bar within concrete, where not practicable to remove.

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	TR	-	Mild steel present in the form of reinforcing bar within concrete, where not practicable to remove.
Other ferrous metals.....	TR	-	
Iron.....	= 0	-	
Aluminium.....	= 0	-	
Beryllium.....	= 0	-	
Cobalt.....	= 0	-	
Copper.....	= 0	-	
Lead.....	= 0	-	
Magnox/Magnesium.....	= 0	-	
Nickel.....	= 0	-	
Titanium.....	= 0	-	
Uranium.....	= 0	-	
Zinc.....	TR 0	-	
Zircaloy/Zirconium.....	= 0	-	
Other metals.....	= 0	-	

Organics (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulotics.....	= 0.15	-	Small quantities of wood / timber.
Paper, cotton.....	TR	-	
Wood.....	= 0.15	-	
Halogenated plastics.....	< 0.01	-	
Total non-halogenated plastics.....	TR	-	
Condensation polymers.....	TR	-	
Others.....	TR	-	
Organic ion exchange materials.....	= 0	-	
Total rubber.....	TR	-	
Halogenated rubber.....	TR	-	
Non-halogenated rubber.....	TR	-	
Hydrocarbons.....	= 0.94	-	
Oil or grease.....	-	-	
Fuel.....	-	-	
Asphalt/Tarmac (cont.coal tar).....	-	-	
Asphalt/Tarmac (no coal tar).....	= 0.94	-	
Bitumen.....	-	-	
Others.....	-	-	
Other organics.....	= 3.7	Includes mixed municipal wastes, organic material "coke", biodegradable wastes, street cleaning residues and sewage cake.	

Other materials (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Inorganic ion exchange materials.....	= 0	-	Includes mixed demolition and mixed construction wastes.
Inorganic sludges and flocs.....	= 0	-	
Soil.....	= 85.3	-	
Brick/Stone/Rubble.....	= 2.6	-	
Cementitious material.....	= 6.9	-	
Sand.....	< 0.01	-	
Glass/Ceramics.....	= 0.35	Includes glass from vitrified waste, ceramics and MMMF.	
Graphite.....	TR	-	
Desiccants/Catalysts.....	-	-	
Asbestos.....	TR	-	
Non/low friable.....	-	-	
Moderately friable.....	-	-	
Highly friable.....	-	-	
Free aqueous liquids.....	P	-	
Free non-aqueous liquids.....	TR	-	
Powder/Ash.....	< 0.01	Includes waste blasting material (Garnet).	

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

Inorganic anions (%wt):

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

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.....	= 3.3	-
Putrescible wastes.....	= 2.0	-
Non-putrescible wastes.....	1.2	-
Corrosive materials.....	= 0	-
Pyrophoric materials.....	= 0	-
Generating toxic gases.....	P	~~1% putrescible may give rise to methane and CO2.
Reacting with water.....	= 0	-
Higher activity particles.....	= 0	Active particles unlikely to be present.
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):

No

	(%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.....	= 0	-
EEE Type 2.....	= 0	-
EEE Type 3.....	= 0	-
EEE Type 4.....	= 0	-
EEE Type 5.....	= 0	-

TREATMENT, PACKAGING AND DISPOSAL

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

Treatment	On-site / Off-site	Stream volume %
Size reduction		
Decay storage		
Low force compaction		
Supercompaction (HFC)		
Incineration		
Drying/dewatering/liquid separation		
Tie down/fixatives/strippable coating/painting application		
Decontamination		
Metal treatment		
Recycling / reuse		
Thermal treatment, including vitrification		
Encapsulation		
Polymer encapsulation		
Other physical treatment		
Other chemical treatment		
Containerisation		
Treatment not yet determined		
None		= 100.0

Comments on planned treatments:

None planned currently.

Conditioning method:

N/A

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
-	-	-	-	-	-

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)			
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			
Expected to be consigned to a Landfill Facility			
Expected to be disposed On-Site			
Expected to be managed by In-Situ Disposal			
Expected to be consigned to an Incineration Facility			
Expected to be consigned to a Metal Treatment Facility			
Expected to be Out of Scope			
Expected to be recycled / reused			
Disposal route not known			
	= 100.0		2025

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

17 05 04, 20 02 01, 17 01 01, 20 03 06, 17 01 02, 17 09 04, 17 06 04, 17 03 02

Opportunities for alternative disposal routing: No

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

RADIOACTIVITY

Source: Dependant on plant of origin. May include activation products, fission products and/or fuel contamination.

Uncertainty: The average specific activities are calculated from characterisation of sentenced arisings, the values differ for each project/location, and can be highly variable.

Measurement of radioactivities: The specific activity of future arisings has been calculated from arisings to date, incorporated with detailed radionuclide fingerprints for the plants or origin and including any anticipated future waste which significantly differs from historic and current arisings.

Chemical form of radionuclides:

- H-3: -
- C-14: -
- Cl-36: -
- Se-79: -
- Tc-99: -
- I-129: -
- Ra: -
- Th: -
- U: -
- Np: -
- Pu: -

WASTE STREAM 2Y57 Low Level Waste (LLW) Onsite Landfill									
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			= 3.92E-07	C C 2	Gd 153				
Be 10					Ho 163				
C 14			= 6.19E-09	C C 2	Ho 166m				
Na 22					Tm 170				
Al 26					Tm 171				
Cl 36			= 2.16E-10	C C 2	Lu 174				
Ar 39					Lu 176				
Ar 42					Hf 178n				
K 40					Hf 182				
Ca 41					Pt 193				
Mn 53					Ti 204				
Mn 54			= 1.35E-11	C C 2	Pb 205				
Fe 55			= 6.36E-10	C C 2	Pb 210			= 9.21E-10	C C 2
Co 60			= 9.36E-10	C C 2	Bi 208				
Ni 59					Bi 210m				
Ni 63			= 1.00E-09	C C 2	Po 210				
Zn 65			= 5.17E-12	C C 2	Ra 223				
Se 79					Ra 225				
Kr 81					Ra 226			= 1.51E-09	C C 2
Kr 85					Ra 228				
Rb 87					Ac 227				
Sr 90			= 2.85E-08	C C 2	Th 227				
Zr 93					Th 228			= 6.72E-13	C C 2
Nb 91					Th 229			= 8.41E-14	C C 2
Nb 92					Th 230			= 2.82E-10	C C 2
Nb 93m					Th 232			= 2.04E-10	C C 2
Nb 94					Th 234			= 1.09E-09	C C 2
Mo 93					Pa 231			= 9.01E-10	C C 2
Tc 97					Pa 233				
Tc 99			= 2.55E-10	C C 2	U 232			= 2.09E-12	C C 2
Ru 106			= 5.90E-10	C C 2	U 233			= 1.87E-13	C C 2
Pd 107					U 234			= 2.62E-09	C C 2
Ag 108m					U 235			= 9.49E-11	C C 2
Ag 110m			= 2.60E-11	C C 2	U 236			= 4.21E-11	C C 2
Cd 109					U 238			= 1.62E-09	C C 2
Cd 113m					Np 237			= 5.58E-11	C C 2
Sn 119m					Pu 236				
Sn 121m					Pu 238			= 1.04E-09	C C 2
Sn 123					Pu 239			= 2.12E-09	C C 2
Sn 126					Pu 240			= 2.39E-09	C C 2
Sb 125			= 1.35E-10	C C 2	Pu 241			= 3.29E-08	C C 2
Sb 126					Pu 242			= 5.35E-13	C C 2
Te 125m					Am 241			= 8.08E-09	C C 2
Te 127m					Am 242m				
I 129			= 2.50E-11	C C 2	Am 243			= 1.08E-11	C C 2
Cs 134			= 4.17E-10	C C 2	Cm 242			= 4.56E-12	C C 2
Cs 135					Cm 243			= 8.02E-13	C C 2
Cs 137			= 7.62E-07	C C 2	Cm 244			= 5.71E-11	C C 2
Ba 133					Cm 245			= 3.13E-14	C C 2
La 137					Cm 246			= 3.07E-15	C C 2
La 138					Cm 248				
Ce 144			= 1.85E-10	C C 2	Cf 249				
Pm 145					Cf 250				
Pm 147			= 3.99E-10	C C 2	Cf 251				
Sm 147					Cf 252				
Sm 151			= 3.57E-10	C C 2	Unsp a				
Eu 152			= 9.34E-13	C C 2	Unsp b/g			= 9.05E-11	C C 2
Eu 154			= 1.78E-10	C C 2	Total a	0	*	2.10E-08	*
Eu 155			= 4.28E-11	C C 2	Total b/g	0	*	1.23E-06	*

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