

WASTE STREAM	7A112	Decommissioning LLW - Natural / Depleted Uranium
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SITE AWE Aldermaston

SITE OWNER Ministry of Defence (MOD)

WASTE CUSTODIAN AWE plc

WASTE TYPE LLW

WASTE VOLUMES

	Reported (m ³)	OR	Conditioned (m ³)	Packaged (m ³)
Stocks:	At 1.4.2025	= 19.7		
Future arisings:	1.4.2025 - 31.3.2030	= 7.7		
	1.4.2031 - 31.3.2033	= 130.3		
	1.4.2034 - 31.3.2036	= 382.1		
	1.4.2037 - 31.3.2039	= 311.7		
	1.4.2040 - 31.3.2042	= 11.1		
	1.4.2043 - 31.3.2045	= 0		
	1.4.2046 - 31.3.2048	= 0		
	1.4.2049 - 31.3.2051	= 51.9		
	1.4.2052 - 31.3.2080	~ 0		
Total future arisings:		894.8		
Total waste volume:		914.5		

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

Comment on arising rates: Future arisings are estimated on recently reviewed decommissioning plans for facilities on site, updated as of February 2025. The total volume of waste arisings will depend on the longevity of the AWE site with estimates being based on the estimated end of life of facilities circa 2080 or beyond.

Additional information on quantities: The stock volume is accurate and taken straight from AWE's Solid Radioactive Waste Management Records System (SRWMRS) electronic database. Unchanged since the previous UK RWI, 2022.

Uncertainty factors on volumes: Stock (upper): x 1.00 Arisings (upper): x 5.00
Stock (lower): x 1.00 Arisings (lower): x 0.20

WASTE SOURCE Waste arising from depleted and natural uranium decommissioning operations.

PHYSICAL CHARACTERISTICS

General description: The 7A112 waste stream contains metals (43.74%), rubble (43.16%), cellulosic material (6.28%), NH plastic/plastic/rubber (6.73%), asbestos (0.07%) and graphite (0.02%).

Changes since waste generated: -

Bulk density (t/m³): ~ 0.51

Comment on density: The density has been calculated using 7A112 disposal data, as in-stock data is extremely sparse.

CHEMICAL COMPOSITION

General description and components (%wt): The 7A112 waste stream contains metals (43.74%), rubble (43.16%), cellulosic material (6.28%), NH plastic/plastic/rubber (6.73%), asbestos (0.07%) and graphite (0.02%).

Chemical state: Neutral

Sheet metal proportion / thickness: The majority of the decommissioning metal is sheets and pipes that are typically 4mm in thickness.

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	= 0	-	
Other ferrous metals.....	= 43.5	-	
Iron.....	= 0	-	
Aluminium.....	= 0	-	
Beryllium.....	= 0	-	
Cobalt.....	= 0	-	
Copper.....	= 0	-	
Lead.....	= 0	-	
Magnox/Magnesium.....	= 0	-	
Nickel.....	= 0	-	
Titanium.....	= 0	-	
Uranium.....	= 0	-	
Zinc.....	= 0	-	
Zircaloy/Zirconium.....	= 0	-	
Other metals.....	= 0.23	Tin, brass and copper (unknown % weights)	

Organics (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulotics.....	= 6.3	-	
Paper, cotton.....	= 0.21	-	
Wood.....	= 6.1	-	
Halogenated plastics.....	= 4.6	-	
Total non-halogenated plastics.....	= 1.9	-	
Condensation polymers.....	= 1.9	-	
Others.....	= 0	-	
Organic ion exchange materials.....	= 0	-	
Total rubber.....	= 0.27	-	
Halogenated rubber.....	= 0.27	-	
Non-halogenated rubber.....	= 0	-	
Hydrocarbons.....	= 0	-	
Oil or grease.....	= 0	-	
Fuel.....	= 0	-	
Asphalt/Tarmac (cont.coal tar).....	= 0	-	
Asphalt/Tarmac (no coal tar).....	= 0	-	
Bitumen.....	= 0	-	
Others.....	= 0	-	
Other organics.....	= 0	-	

Other materials (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Inorganic ion exchange materials.....	= 0	-	
Inorganic sludges and flocs.....	= 0	-	
Soil.....	= 0	-	
Brick/Stone/Rubble.....	= 43.2	-	
Cementitious material.....	= 0	-	
Sand.....	= 0	-	
Glass/Ceramics.....	= 0	-	
Graphite.....	= 0.02	-	
Desiccants/Catalysts.....	= 0	-	
Asbestos.....	= 0.07	Asbestos is likely to be moderately / highly friable	
Non/low friable.....	NE	-	
Moderately friable.....	NE	-	
Highly friable.....	NE	-	
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.....	P	-
Putrescible wastes.....	= 0	-
Non-putrescible wastes.....	P	Paper, cotton and wood present in the waste stream
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.....	= 0	-
Benzene.....	= 0	-
Chlorinated solvents.....	= 0	-
Formaldehyde.....	= 0	-
Organometallics.....	= 0	-
Phenol.....	= 0	-
Styrene.....	= 0	-
Tri-butyl phosphate.....	= 0	-
Other organophosphates.....	= 0	-
Vinyl chloride.....	P	PVC is present in the waste stream
Arsenic.....	= 0	-
Barium.....	= 0	-
Boron.....	= 0	-
Boron (in Boral).....	= 0	-
Boron (non-Boral).....	= 0	-
Cadmium.....	= 0	-
Caesium.....	= 0	-
Selenium.....	= 0	-
Chromium.....	= 0	-
Molybdenum.....	= 0	-
Thallium.....	= 0	-
Tin.....	= 0	-
Vanadium.....	= 0	-
Mercury compounds.....	= 0	-
Others.....	= 0	-

Complexing agents (%wt):

No

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

Physical components:

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

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

Comments on planned treatments:

Conditioning method:

Conditioning plants:

Likely conditioning matrix:

Further information on the conditioning matrix:

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Likely container type:

Range in container waste loading:

Other information on packaging and conditioning:

Conditioned density (t/m³):

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Conditioned density comment:

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

Page 4 of 6

Opportunities for alternative disposal routing: Not yet determined

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

RADIOACTIVITY

Source: U-234, U-235, U-236 and U-238 contaminated waste (specifically depleted and natural uranium).

Uncertainty: The gross alpha and gross beta activities of the in-stock wastes are accurate. The in-stock radionuclide breakdown is also accurate, as this has also been acquired from the AWE Solid Radioactive Waste Management Records System (SRWMRS) electronic database. The future arisings specific activities remain unchanged from the 2022 UK RWI.

Measurement of radioactivities: The fingerprints for these wastes are determined by the materials that have contaminated them, which are used in conjunction with high resolution gamma spectroscopy to assay the wastes.

Chemical form of radionuclides: H-3: Not present in this waste stream
C-14: Not present in this waste stream
Cl-36: Not present in this waste stream
Se-79: Not present in this waste stream
Tc-99: Not present in this waste stream
I-129: Not present in this waste stream
Ra: Only daughter products present from uranium in this waste stream. Oxide form.
Th: Only daughter products present from uranium in this waste stream. Oxide form.
U: Present in this waste stream. Oxide form.
Np: Not present in this waste stream
Pu: Not present in this waste stream

WASTE STREAM 7A112 Decommissioning LLW - Natural / Depleted Uranium									
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					Gd 153				
Be 10					Ho 163				
C 14					Ho 166m				
Na 22					Tm 170				
Al 26					Tm 171				
Cl 36					Lu 174				
Ar 39					Lu 176				
Ar 42					Hf 178n				
K 40					Hf 182				
Ca 41					Pt 193				
Mn 53					Ti 204				
Mn 54					Pb 205				
Fe 55					Pb 210		5	= 2.26E-14	C C 2
Co 60					Bi 208				
Ni 59					Bi 210m				
Ni 63					Po 210		5	= 2.15E-14	C C 2
Zn 65					Ra 223		5	= 2.67E-13	C C 2
Se 79					Ra 225				
Kr 81					Ra 226		5	= 6.27E-14	C C 2
Kr 85					Ra 228		5	= 9.30E-20	C C 2
Rb 87					Ac 227		5	= 2.68E-13	C C 2
Sr 90					Th 227		5	= 2.64E-13	C C 2
Zr 93					Th 228		5	= 8.65E-20	C C 2
Nb 91					Th 229				
Nb 92					Th 230		5	= 6.07E-12	C C 2
Nb 93m					Th 232		5	= 1.12E-19	C C 2
Nb 94					Th 234		5	= 2.43E-08	C C 2
Mo 93					Pa 231		5	= 5.50E-13	C C 2
Tc 97					Pa 233				
Tc 99					U 232				
Ru 106					U 233				
Pd 107					U 234	= 3.07E-07	B B 2	= 1.38E-08	C C 2
Ag 108m					U 235	= 1.11E-08	B B 2	= 5.41E-10	C C 2
Ag 110m					U 236	= 1.43E-09	B B 2	= 4.75E-11	C C 2
Cd 109					U 238	= 2.38E-07	B B 2	= 2.43E-08	C C 2
Cd 113m					Np 237				
Sn 119m					Pu 236				
Sn 121m					Pu 238				
Sn 123					Pu 239				
Sn 126					Pu 240				
Sb 125					Pu 241				
Sb 126					Pu 242				
Te 125m					Am 241				
Te 127m					Am 242m				
I 129					Am 243				
Cs 134					Cm 242				
Cs 135					Cm 243				
Cs 137					Cm 244				
Ba 133					Cm 245				
La 137					Cm 246				
La 138					Cm 248				
Ce 144					Cf 249				
Pm 145					Cf 250				
Pm 147					Cf 251				
Sm 147					Cf 252				
Sm 151					Unsp a				
Eu 152					Unsp b/g				
Eu 154					Total a	5.58E-07	*	3.86E-08	*
Eu 155					Total b/g	2.38E-13	*	2.43E-08	*

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