

WASTE STREAM	7A108	Decommissioning LLW Requiring Further Assay Through the Recategorization Programme
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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	~ 62.2		
Future arisings:	1.4.2025 - 31.3.2080	= 0		
Total future arisings:		0.0		
Total waste volume:		62.2		

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

Comment on arising rates: This waste stream represents waste that was unacceptable to the LLWR. Since the 0.1 GBq/t Pu limit has now been removed, these drums are awaiting re-assay. The wastes in this category require re-assessment prior to being assigned a sentencing category.

Additional information on quantities: Once re-assayed and reassessed, waste from 7A108 will be transferred to either 7A111 or 7A115 waste streams. It is unknown what the exact stock volume will be as the data available places the stock in either 7A111 or 7A115, where stocks would be transferred post assay anyway.

Upper stock uncertainty estimated only and based on projected figures of containers of interest.

Uncertainty factors on volumes: Stock (upper): x 5.00 Arisings (upper): x -
Stock (lower): x 0.50 Arisings (lower): x -

WASTE SOURCE The wastes are generated from general decommissioning activities in plutonium/uranium contaminated facilities.

PHYSICAL CHARACTERISTICS

General description: PVC sheeting, tools, graphite, filler material, equipment, metal wastes typically from glove-boxes. Waste is held in fibreboard or polythene inner drums which are placed in metal outer drums.

Changes since waste generated: -

Bulk density (t/m³): ~ 0.43

Comment on density: Accurate bulk density based on 2019 in-stock data.

CHEMICAL COMPOSITION

General description and components (%wt): Metal (83.9%), plastics (9.98%), rubber (1.01%) cellulose (2.01%), rubble (1.95%), glass (1.05%) and asbestos (<0.1%). Not changed since 2019, so identical to the last UKRWI submission.

Chemical state: Neutral

Sheet metal proportion / thickness: Sheet metal of approximately 4mm thickness will be present arising from glove-box and ductwork.

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	= 36.0	-	
Other ferrous metals.....	= 45.0	-	
Iron.....	= 0	-	
Aluminium.....	= 1.0	-	
Beryllium.....	= 0	-	
Cobalt.....	= 0	-	
Copper.....	= 1.0	-	
Lead.....	< 0.90	-	
Magnesium.....	= 0	-	
Nickel.....	= 0	-	
Titanium.....	= 0	-	
Uranium.....	= 0	-	
Zinc.....	= 0	-	
Zircaloy/Zirconium.....	= 0	-	
Other metals.....	= 0	-	

Organics (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulose.....	= 2.0	-	
Paper, cotton.....	= 0.80	-	
Wood.....	= 1.2	-	
Halogenated plastics.....	= 5.0	-	
Total non-halogenated plastics.....	= 5.0	-	
Condensation polymers.....	= 0	-	
Others.....	= 0	-	
Organic ion exchange materials.....	= 0	-	
Total rubber.....	= 1.0	-	
Halogenated rubber.....	= 0	-	
Non-halogenated rubber.....	= 1.0	-	
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.....	= 2.0	-	
Cementitious material.....	= 0	-	
Sand.....	= 0	-	
Glass/Ceramics.....	= 1.1	-	
Graphite.....	= 0	-	
Desiccants/Catalysts.....	= 0	-	
Asbestos.....	< 0.10	Waste will contain asbestos with varying friability	
Non/low friable.....	< 0.10	-	
Moderately friable.....	< 0.10	-	
Highly friable.....	< 0.10	-	
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	-
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.....	-	-
Arsenic.....	NE	-
Barium.....	= 0	-
Boron.....	NE	-
Boron (in Boral).....	NE	-
Boron (non-Boral).....	NE	-
Cadmium.....	NE	-
Caesium.....	= 0	-
Selenium.....	NE	-
Chromium.....	NE	-
Molybdenum.....	NE	-
Thallium.....	= 0	-
Tin.....	NE	-
Vanadium.....	NE	-
Mercury compounds.....	= 0	-
Others.....	NE	-

Complexing agents (%wt):

Yes		
	(%wt)	Type(s) and comment
EDTA.....	= 0	-
DPTA.....	= 0	-
NTA.....	= 0	-
Polycarboxylic acids.....	< 0.50	-
Other organic complexants.....	< 0.50	Complexing agents are likely to be present because of their use as decontaminants.
Total complexing agents.....	< 1.0	-

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.....		-

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	Off-site	~ 100.0
None		

Comments on planned treatments:

-

Conditioning method:

-

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	~ 0.43	

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: Predominantly plutonium and uranium contamination.

Uncertainty: Total alpha and total beta/gamma activities are correct for the in-stock wastes, radionuclide breakdown estimated based on associated fingerprints from facilities.

Measurement of radioactivities: Typically these wastes were assayed using PNCC (Pu drums), which (at the time) was not configured to distinguish between HAW and LLW or LRGS (EU drums).

Chemical form of radionuclides:

- H-3: Not present in Waste Stream
- C-14: Not present in Waste Stream
- Cl-36: Not present in Waste Stream
- Se-79: Not present in Waste Stream
- Tc-99: Not present in Waste Stream
- I-129: Not present in 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 Waste Stream as oxide form
- Np: Np-237 likely to be present in waste stream in oxide form as daughter product of Am-241 alpha decay.
- Pu: Present in Waste Stream as oxide form

WASTE STREAM		7A108		Decommissioning LLW Requiring Further Assay Through the Recategorization Programme					
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					Tl 204				
Mn 54					Pb 205				
Fe 55					Pb 210		5		
Co 60					Bi 208				
Ni 59					Bi 210m				
Ni 63					Po 210		5		
Zn 65					Ra 223		5		
Se 79					Ra 225		5		
Kr 81					Ra 226		5		
Kr 85					Ra 228		5		
Rb 87					Ac 227		5		
Sr 90					Th 227		5		
Zr 93					Th 228		5		
Nb 91					Th 229		5		
Nb 92					Th 230		5		
Nb 93m					Th 232		5		
Nb 94					Th 234		5		
Mo 93					Pa 231		5		
Tc 97					Pa 233		5		
Tc 99					U 232				
Ru 106					U 233		5		
Pd 107					U 234	~ 1.15E-07	C C 2		
Ag 108m					U 235	~ 4.44E-09	C C 2		
Ag 110m					U 236	~ 7.67E-10	C C 2		
Cd 109					U 238	~ 7.07E-09	C C 2		
Cd 113m					Np 237		5		
Sn 119m					Pu 236				
Sn 121m					Pu 238	~ 2.73E-05	C C 2		
Sn 123					Pu 239	~ 6.90E-04	C C 2		
Sn 126					Pu 240	~ 1.78E-04	C C 2		
Sb 125					Pu 241	~ 1.62E-04	C C 2		
Sb 126					Pu 242	~ 3.61E-08	C C 2		
Te 125m					Am 241	~ 2.83E-04	C C 2		
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	1.18E-03	*	0	*
Eu 155					Total b/g	1.62E-04	*	0	*

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