

WASTE STREAM	2D43	Pond Skips
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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			
Future arisings:	= 290.3			
Total future arisings:	0.0			
Total waste volume:	290.3			

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

Comment on arising rates: There are no current or future arisings of skips into the pond. The stock volume is based on a skip envelope disposal volume of 7.08m³ and the 31st March 2025 figure of 41 skips in the pond.

Additional information on quantities: In 2011 the pond contained 186 skips. Up to 01/04/2025, 145 skips have been removed and size reduced in WAMAC pending a decision on recycling or disposal at the LLWR, leaving a stock of 41.

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

WASTE SOURCE Skips were/are used for the movement and storage of materials within the pond.

PHYSICAL CHARACTERISTICS

General description: Envelope dimensions of a skip are: 2,387mm x 1,880mm x 1,581mm (envelope volume of 7.08m³ is used); mass 1.25t. Skips are constructed from an open topped aluminium box held within a mild steel frame. Skips are large heavy items weighing 1.25t each.

Changes since waste generated: The waste has not undergone any change since it was generated.

Bulk density (t/m³): = 0.18

Comment on density: Density based on estimated skip weight divided by envelope volume of skip.

CHEMICAL COMPOSITION

General description and components (%wt): Mild steel (90%), aluminium alloy (Alclad) (10%).

Chemical state: Neutral

Sheet metal proportion / thickness: The waste comprises mainly mild steel framework. Aluminium alloy (Alclad) present as flat sheets fabricated into boxes and secured in the mild steel framework. Overall size 2,387x1,880x1,581 mm.

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	= 0	-	
Other ferrous metals.....	~ 90.0	Unknown grade.	
Iron.....	-	-	
Aluminium.....	~ 10.0	Alclad' 0.007m ³ per skip.	
Beryllium.....	= 0	-	
Cobalt.....	= 0	-	
Copper.....	-	-	
Lead.....	= 0	-	
Magnox/Magnesium.....	= 0	-	
Nickel.....	-	-	
Titanium.....	= 0	-	
Uranium.....	TR	-	
Zinc.....	= 0	-	
Zircaloy/Zirconium.....	= 0	-	
Other metals.....	= 0	-	

Organics (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulose.....	= 0	-	
Paper, cotton.....	= 0	-	
Wood.....	= 0	-	
Halogenated plastics.....	= 0	-	
Total non-halogenated plastics.....	= 0	-	
Condensation polymers.....	= 0	-	
Others.....	= 0	-	
Organic ion exchange materials.....	= 0	-	
Total rubber.....	= 0	-	
Halogenated rubber.....	= 0	-	
Non-halogenated rubber.....	= 0	-	
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	-	
Inorganic sludges and flocs.....	= 0	-	
Soil.....	= 0	-	
Brick/Stone/Rubble.....	= 0	-	
Cementitious material.....	= 0	-	
Sand.....	= 0	-	
Glass/Ceramics.....		-	
Graphite.....	= 0	-	
Desiccants/Catalysts.....	= 0	-	
Asbestos.....	= 0	-	
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.....	= 0	-
Putrescible wastes.....	= 0	-
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.....	= 0	-
Benzene.....		-
Chlorinated solvents.....		-
Formaldehyde.....		-
Organometallics.....	= 0	-
Phenol.....		-
Styrene.....		-
Tri-butyl phosphate.....		-
Other organophosphates.....	= 0	-
Vinyl chloride.....		-
Arsenic.....	= 0	-
Barium.....		-
Boron.....	= 0	-
Boron (in Boral).....		-
Boron (non-Boral).....		-
Cadmium.....	= 0	-
Caesium.....		-
Selenium.....	= 0	-
Chromium.....		-
Molybdenum.....	= 0	-
Thallium.....		-
Tin.....	= 0	-
Vanadium.....		-
Mercury compounds.....	= 0	-
Others.....		-

Complexing agents (%wt):

No		
	(%wt)	Type(s) and comment
EDTA.....	= 0	-
DPTA.....		-
NTA.....		-
Polycarboxylic acids.....		-
Other organic complexants.....	= 0	No other complexing agents are present.
Total complexing agents.....		

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	Off-site	100.0
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		

Comments on planned treatments:

The skips have been deemed suitable for metal melting and exports are ongoing. Many skips contain other wastes. They cannot be retrieved for disposal until emptied. In addition, some empty skips may be retained in the pond until all other wastes are removed to aid sorting/retrieval operations of other wastes.

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: Up to 01/04/2025, 145 skips have been removed from the pond, and have been monitored and shown to be acceptable for recycling through metal melting. Any skips not meeting the CFA for metal melting will be subject to a Waste Enquiry Note to LLWR requesting alternate treatment method or LLWR disposal. LLW Slag produced during metal melting will be returned to LLWR for disposal. This will be consigned by the service provider in a HHISO alongside slags from other waste streams undergoing the same treatment.

Conditioned density (t/m³): -

Conditioned density comment: -

Management Routes:

Disposal Route	Stream volume %	Raw density t/m ³	Start date	
Expected to be consigned to a Near Site, Near Surface Disposal Facility (Scotland)	= 100.0			
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				

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

Opportunities for alternative disposal routing: No

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

RADIOACTIVITY

Source: Contamination from skip contents, pond water and sludges.

Uncertainty: -

Measurement of radioactivities: By gamma probe measurement on the skips removed from the pond. The total activity on the skips exported thus far ranges from 1.1 to 11 GBq/te beta gamma. For the purposes of this submission it has been rounded to an average of 6GBq/te beta gamma. Based on skip weight of 1.25te and volume of 7.08m3, this gives total beta activity of 1.06E-3TBq/m3. The alpha figure is calculated from the Activity Conversion Factor for this waste stream of 12.97:1 beta:alpha.

Chemical form of radionuclides: H-3: -
C-14: -
Cl-36: -
Se-79: -
Tc-99: -
I-129: -
Ra: -
Th: None expected.
U: -
Np: -
Pu: -

WASTE STREAM 2D43 Pond Skips									
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	5.15E-06	B B 2			Gd 153				
Be 10					Ho 163				
C 14	1.02E-06	B B 2			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	1.44E-08	B B 2			Pb 210	4.54E-16			
Co 60	6.77E-08	B B 2			Bi 208				
Ni 59					Bi 210m				
Ni 63	5.25E-06	B B 2			Po 210	2.78E-16			
Zn 65					Ra 223	5.01E-20			
Se 79					Ra 225	8.56E-21			
Kr 81					Ra 226	1.52E-14			
Kr 85					Ra 228	1.29E-23			
Rb 87					Ac 227	5.81E-20			
Sr 90	3.32E-04	B B 2			Th 227	5.16E-20			
Zr 93					Th 228	2.71E-24			
Nb 91					Th 229	9.35E-21			
Nb 92					Th 230	2.34E-11			
Nb 93m					Th 232	1.31E-22			
Nb 94					Th 234	5.93E-07			
Mo 93					Pa 231	1.88E-18			
Tc 97					Pa 233	1.63E-11			
Tc 99					U 232				
Ru 106					U 233	1.02E-16			
Pd 107					U 234	8.48E-07	B B 2		
Ag 108m					U 235	5.91E-14			
Ag 110m					U 236	1.78E-12			
Cd 109					U 238	5.93E-07	B B 2		
Cd 113m					Np 237	1.69E-11			
Sn 119m					Pu 236				
Sn 121m					Pu 238	2.08E-06	B B 2		
Sn 123					Pu 239	2.00E-05	B B 2		
Sn 126					Pu 240	2.00E-05	B B 2		
Sb 125					Pu 241	4.73E-05	B B 2		
Sb 126					Pu 242				
Te 125m					Am 241	1.74E-05	B B 2		
Te 127m					Am 242m				
I 129					Am 243				
Cs 134					Cm 242				
Cs 135					Cm 243				
Cs 137	2.57E-04	B B 2			Cm 244	6.49E-08	B B 2		
Ba 133					Cm 245				
La 137					Cm 246				
La 138					Cm 248				
Ce 144					Cf 249				
Pm 145					Cf 250				
Pm 147	5.33E-08	B B 2			Cf 251				
Sm 147	1.60E-18				Cf 252				
Sm 151	1.01E-05	B B 2			Unsp a				
Eu 152					Unsp b/g				
Eu 154	1.93E-07	B B 2			Total a	6.10E-05	*	0	*
Eu 155					Total b/g	6.59E-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