

WASTE STREAM	7J23	Miscellaneous ILW
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SITE HMNB Portsmouth

SITE OWNER Ministry of Defence (MOD)

WASTE CUSTODIAN Ministry of Defence (MOD)

WASTE TYPE ILW

WASTE VOLUMES

Stocks:
Future arisings:

	Reported (m ³)
At 1.4.2025	= 10.0
1.4.2025 - 31.3.2026	~ 0
1.4.2026 - 31.3.2027	~ 0
1.4.2027 - 31.3.2028	~ 0.3
1.4.2028 - 31.3.2029	~ 0.3
1.4.2029 - 31.3.2030	~ 0.3
1.4.2030 - 31.3.2031	~~ 0.3
1.4.2031 - 31.3.2032	~~ 0.3
1.4.2032 - 31.3.2033	~~ 0.3
1.4.2033 - 31.3.2043	~~ 0.3
1.4.2043 - 31.3.2053	~~ 0.3
1.4.2053 - 31.3.2063	~~ 0.3

OR

Conditioned (m ³)	Packaged (m ³)

Total future arisings: **2.3**
Total waste volume: **12.3**

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

Comment on arising rates: HMNB Portsmouth is a repository for redundant MoD equipment that contains radioactive sources and instrument check sources. Waste arising does not occur at a constant rate. Items are declared as waste upon transfer to the authorised disposal contractor. Any future waste arisings are difficult to determine as they are dependent on a number of factors such as equipment being declared as obsolete by equipment manager and legacy items being returned following site closures.

Additional information on quantities: Items held as original equipment, not packaged i.e. transit cases removed prior to authorised disposal contractor consigning to approved disposal route.

Uncertainty factors on volumes: Stock (upper): x 1.50 Arisings (upper): x 2.00
Stock (lower): x 0.50 Arisings (lower): x 0.50

WASTE SOURCE MoD stock and residual holdings of NNPP material and effluent receipt facility material. No disposals have taken place since 2022. This data is forecast for process work creating disposals to recommence.

PHYSICAL CHARACTERISTICS

General description: Spark gaps, smoke detectors, electronic valves, functional check sources, thoriated optical lenses, Swabs, paper towels, coveralls, contaminated tools, equipment, etc. that include some contaminated steel pipes, and other small quantities of redundant NPW ancillary shore based support equipment.

Changes since waste generated: The wastes have not been subject to any physical/chemical processes save that of delay and decay which has resulted in both 'free release' and disposal as VLLW to a controlled landfill site.

Bulk density (t/m³): NE

Comment on density: The waste bulk will be calculated upon declaring items as waste post any volume reduction exercise.

CHEMICAL COMPOSITION

General description and components (%wt): Metal (84%) Organics (4%) Other materials (10%)

Chemical state: Neutral

Sheet metal proportion / thickness: No metal is present in sheet form

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	= 35.0	Austenitic SS	25.0
Other ferrous metals.....	= 0	-	
Iron.....	= 5.0	-	10.0
Aluminium.....	= 30.0	Aluminium (20%), Dural (10%)	25.0
Beryllium.....	= 0	-	10.0
Cobalt.....	= 0	-	
Copper.....	= 8.0	Copper (5%), Brass (2%), Bronze (1%)	
Lead.....	< 1.0	-	
Magnox/Magnesium.....	= 0	-	
Nickel.....	= 5.0	electroplated Nickel (5%)	
Titanium.....	= 0	-	10.0
Uranium.....	= 2.0	DU weights	
Zinc.....	= 0	-	
Zircaloy/Zirconium.....	= 0	-	10.0
Other metals.....	= 0	-	

Organics (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulose.....	= 2.0	-	10.0
Paper, cotton.....	= 2.0	Paper (1.5%), cotton (0.5%)	10.0
Wood.....	= 0	-	
Halogenated plastics.....	= 0	-	
Total non-halogenated plastics.....	= 0	-	
Condensation polymers.....	= 0	-	
Others.....	= 0	-	
Organic ion exchange materials.....	= 0	-	
Total rubber.....	= 2.0	-	5.0
Halogenated rubber.....	= 0	-	
Non-halogenated rubber.....	= 2.0	Latex (2%)	5.0
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.....	= 0	-	
Cementitious material.....	= 0	-	
Sand.....	= 0	-	
Glass/Ceramics.....	~ 10.0	glass dial fronts	10.0
Graphite.....	= 0	-	
Desiccants/Catalysts.....	= 0	-	
Asbestos.....	= 0	-	
Non/low friable.....	= 0	-	
Moderately friable.....	= 0	-	
Highly friable.....	= 0	-	
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.....	= 0	-
Chlorinated solvents.....	= 0	-
Formaldehyde.....	= 0	-
Organometallics.....	= 0	-
Phenol.....	= 0	-
Styrene.....	= 0	-
Tri-butyl phosphate.....	= 0	-
Other organophosphates.....	= 0	-
Vinyl chloride.....	= 0	-
Arsenic.....	= 0	-
Barium.....	NE	-
Boron.....	NE	-
Boron (in Boral).....	NE	-
Boron (non-Boral).....	NE	-
Cadmium.....	NE	-
Caesium.....	NE	-
Selenium.....	= 0	-
Chromium.....	= 0	-
Molybdenum.....	= 0	-
Thallium.....	= 0	-
Tin.....	NE	-
Vanadium.....	= 0	-
Mercury compounds.....	= 0	-
Others.....	NE	-

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.....	NE	-
Electronic & Electrical Equipment (EEE)		
EEE Type 1.....	NE	-
EEE Type 2.....	= 0	-
EEE Type 3.....	NE	-
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	On-site	= 10.0
Decay storage	On-site	= 90.0
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:

Size reduction will only commence once fully staffed (Estimated 2026-2028)

Conditioning method:

No conditioning as 100% of waste is consigned to authorised disposal contractor who determines the quantity that requires to be consigned as radioactive waste as appropriate and subsequently route to LLWR or metal decontamination, incineration, recycling/reuse etc.

Conditioning plants:

Plant Name	Location

Likely conditioning matrix:

Unknown

Further information on the conditioning matrix:

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Waste Packaging:

Likely container type:

Container	Waste packaged (vol%)	Waste loading (m³)	Payload (m³)	Number of packages	Estimated start date for packaging
Not yet determined	100.0	-	-	-	-

Range in container waste loading:

Other information on packaging and conditioning:

There are no packaging or conditioning plants planned.

Conditioned density (t/m³):

NE

Conditioned density comment:

Cannot be accurately ascertained until the ILW has been declared to the waste contractor

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	NE	NE	

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

Opportunities for alternative disposal routing: Yes

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

RADIOACTIVITY

Source:	Redundant MoD sources, includes some historic wastes, contaminated items with activation products from reactor operations.
Uncertainty:	The accuracy of activity measurement for the wastes are estimates to be approximately between 90 - 100% for the redundant MoD items containing radioactive sources. For the historic wastes the accuracy is estimated to be within 50%.
Measurement of radioactivities:	The measurement of activity for the historic waste is to be undertaken by specialist assay team.
Chemical form of radionuclides:	H-3: Present in gaseous, water and in luminised paint C-14: Not present in significant amounts Cl-36: impregnated gauze as a check source Se-79: Not present Tc-99: metallic check source I-129: unknown, solid check source/ calibration plaque Ra: Radium 226, in luminised paint Th: Thorium 232 in alloys with magnesium in engine cases and glass optical lenses U: metallic in the form of check sources and DU weights Np: Not present Pu: metallic in the form of check sources

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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	1.16E+02	A A 2	~	1.00E-05	B B 2	Gd 153			
Be 10						Ho 163			
C 14	9.03E-06	A A 2	~~	1.00E-06	B B 2	Ho 166m			
Na 22	3.23E-08	A A 2	~~	1.00E-07	B B 2	Tm 170			
Al 26						Tm 171			
Cl 36	5.81E-07	A A 2	~~	1.00E-04	B B 2	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	1.59E-08	A A 2	~~	2.00E-08	B B 2	Pb 210			
Co 60	1.07E-05	A A 2	~~	3.00E-05	B B 2	Bi 208			
Ni 59						Bi 210m			
Ni 63	1.80E-02	A A 2	~	5.00E-01	B B 2	Po 210			
Zn 65						Ra 223			
Se 79						Ra 225			
Kr 81						Ra 226			
Kr 85	3.52E-04	A A 2	~~	2.00E-06	B B 2	Ra 228			
Rb 87	2.67E-10	A A 2				Ac 227			
Sr 90	2.61E-01	A A 2	~~	3.00E-01	B B 2	Th 227			
Zr 93						Th 228			
Nb 91						Th 229			
Nb 92						Th 230	6.46E-09	A A 2	~~ 1.00E-09 B B 2
Nb 93m						Th 232	4.94E-04	A A 2	~~ 1.00E-04 B B 2
Nb 94						Th 234			
Mo 93						Pa 231			
Tc 97						Pa 233			
Tc 99	3.18E-06	A A 2				U 232	8.49E-10	A A 2	
Ru 106						U 233			
Pd 107						U 234			
Ag 108m						U 235	2.00E-10	A A 2	
Ag 110m						U 236			
Cd 109						U 238	4.37E-05	A A 2	~~ 4.00E-05 B B 2
Cd 113m						Np 237			
Sn 119m						Pu 236			
Sn 121m						Pu 238	3.75E-07	A A 2	~~ 2.00E-07 B B 2
Sn 123						Pu 239	2.68E-06	A A 2	~~ 2.00E-07 B B 2
Sn 126						Pu 240			
Sb 125						Pu 241			
Sb 126						Pu 242			
Te 125m						Am 241	1.14E-03	A A 2	~ 9.00E-04 B B 2
Te 127m						Am 242m			
I 129	3.00E-08	A A 2	~~	1.00E-08	B B 2	Am 243			
Cs 134	1.03E-09	A A 2	~~	3.00E-09	B B 2	Cm 242			
Cs 135						Cm 243			
Cs 137	2.34E-03	A A 2	~~	3.00E-04	B B 2	Cm 244			
Ba 133	1.77E-06	A A 2	~~	2.00E-04	B B 2	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	1.30E-08	A A 2	< 1.00E-07 B B 2
Sm 151						Unsp a			
Eu 152	1.00E-07	A A 2	~~	1.00E-07	B B 2	Unsp b/g	6.15E-12	A A 2	~~ 2.00E-08 B B 2
Eu 154						Total a	1.68E-03	*	1.04E-03 *
Eu 155						Total b/g	1.16E+02	*	8.01E-01 *

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