

WASTE STREAM	9E960	Active Waste Store, Active Laundry LLW
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SITE Oldbury

SITE OWNER Nuclear Decommissioning Authority

WASTE CUSTODIAN Nuclear Restoration Services Ltd (NRS)

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	= 3.2		
	1.4.2026 - 31.3.2027	= 8.0		
	1.4.2027 - 31.3.2028	= 4.0		
	1.4.2028 - 31.3.2034	= 3.7		
Total future arisings:		18.9		
Total waste volume:		18.9		

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

Comment on arising rates: -

Additional information on quantities: -

Uncertainty factors on volumes:

Stock (upper):	x -	Arisings (upper):	x 1.20
Stock (lower):	x -	Arisings (lower):	x 0.80

WASTE SOURCE The 9E960 waste stream will be used to capture waste mainly from the Vacuum Cleaners (VC) and Active Waste Store (AWS) areas with smaller quantities generated from site labs, Unitech returns and Miscellaneous Contaminated Items (MCI) soft waste.

PHYSICAL CHARACTERISTICS

General description: The waste consigned under waste stream 9E960 mainly comprises metal, concrete and rubble, soil, biodegradable materials, plasterboard, plastics, rubber, wood and other materials. Metals are likely to include steel (stainless and mild), lead, iron, copper, zinc, magnesium and aluminium. Other materials, include asbestos, vacuum debris, oil and glass. The waste is expected to be in the form of mixed trash with occasional large items such as pipework, motors, pumps, lifting equipment and frames. Vacuum debris includes building dust and organic matter.

Changes since waste generated: -

Bulk density (t/m³): ~ 0.52

Comment on density: -

CHEMICAL COMPOSITION

General description and components (%wt): Metal (~46% wt), concrete/rubble (5%), soil (3%), plasterboard (2%), plastics (15%), rubber (14%), wood (~6%), other organic (2%), and others including vacuum debris from redundant incinerator (~8%).

Chemical state: Neutral

Sheet metal proportion / thickness: -

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	= 7.8	Items such as pipework, flooring plates, brackets, frames	
Other ferrous metals.....	= 31.2	mild steel - Items such as pipework, flooring plates, brackets, frames	
Iron.....	= 1.0	Trace in waste items such as power hand tools	
Aluminium.....	= 1.1	Aluminium in waste items such as ladders and ducting	
Beryllium.....	NE	-	
Cobalt.....	-	-	
Copper.....	= 0.20	Trace in waste items such as pipework	
Lead.....	= 4.4	sheet, pipe, block and shot	
Magnox/Magnesium.....	TR	Trace in waste items such as power hand tools	
Nickel.....	-	-	
Titanium.....	-	-	
Uranium.....	NE	-	
Zinc.....	= 0.40	Galvanised steel in items such as gratings or buckets	
Zircaloy/Zirconium.....	= 0	-	
Other metals.....	= 0	Mass estimates in the table above for mild steel and stainless steel include the constituent alloying elements such as Cr, Fe, Ni and Co. Therefore, these constituent alloying elements are not recorded separately to avoid double accounting.	

Organics (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulose.....	~ 6.0	-	
Paper, cotton.....	= 0	-	
Wood.....	~ 6.0	-	
Halogenated plastics.....	~ 6.2	PVC, PPE	
Total non-halogenated plastics.....	~ 9.2	-	
Condensation polymers.....	~ 4.6	pipes, poly, PPE, perspex, containers, sheet and hoses	
Others.....	~ 4.6	pipes, poly, PPE, perspex, containers, sheet and hoses	
Organic ion exchange materials.....	= 0	-	
Total rubber.....	~ 14.0	-	
Halogenated rubber.....	~ 14.0	Neoprene	
Non-halogenated rubber.....	-	-	
Hydrocarbons.....	-	-	
Oil or grease.....	-	-	
Fuel.....	-	-	
Asphalt/Tarmac (cont.coal tar).....	-	-	
Asphalt/Tarmac (no coal tar).....	-	-	
Bitumen.....	-	-	
Others.....	-	-	
Other organics.....	~ 2.0	-	

Other materials (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Inorganic ion exchange materials.....	= 0	-	
Inorganic sludges and flocs.....	= 0	-	
Soil.....	= 3.0	-	
Brick/Stone/Rubble.....	= 5.0	-	
Cementitious material.....	= 0	-	
Sand.....	-	-	
Glass/Ceramics.....	= 0.08	0.04% MMMF lagging (associated with general plant items), 0.04% glass	
Graphite.....	TR	-	
Desiccants/Catalysts.....	-	-	
Asbestos.....	~ 0.08	-	
Non/low friable.....	= 0.04	gaskets/joints - chrysotile (white)	
Moderately friable.....	= 0	-	
Highly friable.....	~ 0.04	Lagging / gaskets - chrysotile (white)	
Free aqueous liquids.....	= 0	-	
Free non-aqueous liquids.....	= 0	-	
Powder/Ash.....	-	-	

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

Inorganic anions (%wt):

	(%wt)	Type(s) and comment
Fluoride.....	= 1.0	Inorganic anions
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.....	TR	-
Biodegradable materials.....	= 35.0	-
Putrescible wastes.....	= 1.0	-
Non-putrescible wastes.....	= 34.0	-
Corrosive materials.....	= 0	-
Pyrophoric materials.....	= 0	-
Generating toxic gases.....	TR	-
Reacting with water.....	P	33.85m2
Higher activity particles.....	-	-
Soluble solids as bulk chemical compounds.....	-	-

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.....	0	-
Boron (in Boral).....	-	-
Boron (non-Boral).....	-	-
Cadmium.....	-	-
Caesium.....	-	-
Selenium.....	-	-
Chromium.....	-	-
Molybdenum.....	-	-
Thallium.....	-	-
Tin.....	-	-
Vanadium.....	-	-
Mercury compounds.....	-	-
Others.....	= 2.0	Others include EEE materials. Weight of EEE materials is approx. 700kg.

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.....	-	-
Electronic & Electrical Equipment (EEE)	-	-
EEE Type 1.....	P	-
EEE Type 2.....	P	-
EEE Type 3.....	P	-
EEE Type 4.....	P	-
EEE Type 5.....	P	-

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	On-site	= 11.9
Supercompaction (HFC)	Off-site	= 11.9
Incineration	Off-site	= 59.3
Drying/dewatering/liquid separation		
Tie down/fixatives/strippable coating/painting application		
Decontamination		
Metal treatment	Off-site	= 5.9
Recycling / reuse		
Thermal treatment, including vitrification		
Encapsulation		
Polymer encapsulation		
Other physical treatment		
Other chemical treatment		
Containerisation		
Treatment not yet determined		
None		= 23.0

Comments on planned treatments:

11.11% of this waste stream is expected to be sent for VLLW disposal to landfill.

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
1/2 Height WAMAC IP-2 ISO (TC08)	11.9	43.2	18.8	1	-
1/2 Height IP-2 Disposal/Re-usable ISO (TC01/TC02)	11.9	10.0	18.3	1	-

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	= 23.7	0.52	
Expected to be consigned to a Landfill Facility	= 11.1	0.52	
Expected to be disposed On-Site			
Expected to be managed by In-Situ Disposal			
Expected to be consigned to an Incineration Facility	= 59.3	0.40	
Expected to be consigned to a Metal Treatment Facility	= 5.9	1.4	
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:

17 04 05, 17 06 04, 17 01 07, 17 06 01*, 17 02 01, 17 02 02, 17 02 03, 17 05 04

Opportunities for alternative disposal routing: No

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

RADIOACTIVITY

Source: Fission products, actinides and activation products.

Uncertainty: Activity values are current best estimates. Specific activity is a function of Station operating history. The values quoted are indicative of the activities that would be expected, although demolition wastes are predicted to be lower in activity than the routine operational wastes and so the values quoted for this stream are expected to be an over estimate.

Measurement of radioactivities: -

Chemical form of radionuclides: H-3: Chemical form of tritium has not been determined.
C-14: Chemical form of carbon 14 has not been determined.
Cl-36: Chemical form of chlorine 36 has not been determined.
Se-79: The selenium-79 content is insignificant.
Tc-99: The technetium-99 content is insignificant.
I-129: The iodine-129 content is insignificant.
Ra: The radium isotope content is insignificant.
Th: The thorium content is insignificant.
U: The uranium isotope content is insignificant.
Np: The neptunium isotope content is insignificant.
Pu: The chemical form of plutonium isotopes has not been determined but may be plutonium oxides.

WASTE STREAM 9E960 Active Waste Store, Active Laundry LLW									
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			3.80E-06	C C 1	Gd 153				8
Be 10				8	Ho 163				8
C 14			5.18E-07	C C 1	Ho 166m				8
Na 22				8	Tm 170				8
Al 26				8	Tm 171				8
Cl 36			5.70E-08	C C 1	Lu 174				8
Ar 39				8	Lu 176				8
Ar 42				8	Hf 178n				8
K 40				8	Hf 182				8
Ca 41				8	Pt 193				8
Mn 53				8	Ti 204				8
Mn 54				8	Pb 205				8
Fe 55			6.87E-08	C C 1	Pb 210				8
Co 60			4.31E-08	C C 2	Bi 208				8
Ni 59				8	Bi 210m				8
Ni 63			1.30E-07	C C 1	Po 210				8
Zn 65				8	Ra 223				8
Se 79				8	Ra 225				8
Kr 81				8	Ra 226				8
Kr 85				8	Ra 228				8
Rb 87				8	Ac 227				8
Sr 90			6.28E-05	C C 1	Th 227				8
Zr 93				8	Th 228				8
Nb 91				8	Th 229				8
Nb 92				8	Th 230				8
Nb 93m				8	Th 232				8
Nb 94			1.03E-08	C C 2	Th 234			2.01E-08	C C 2
Mo 93				8	Pa 231				8
Tc 97				8	Pa 233				8
Tc 99				8	U 232				8
Ru 106			2.55E-09	C C 2	U 233				8
Pd 107				8	U 234			1.74E-08	C C 2
Ag 108m			2.09E-08	C C 2	U 235				8
Ag 110m				8	U 236			2.62E-09	C C 2
Cd 109				8	U 238			2.01E-08	C C 2
Cd 113m				8	Np 237				8
Sn 119m				8	Pu 236				8
Sn 121m				8	Pu 238			3.63E-07	C C 1
Sn 123				8	Pu 239			4.26E-07	C C 1
Sn 126				8	Pu 240			5.51E-07	C C 1
Sb 125			3.83E-09	C C 2	Pu 241			1.43E-05	C C 1
Sb 126				8	Pu 242				8
Te 125m				8	Am 241			3.56E-06	C C 1
Te 127m				8	Am 242m				8
I 129				8	Am 243				8
Cs 134			5.22E-08	C C 2	Cm 242				8
Cs 135				8	Cm 243			5.28E-08	C C 1
Cs 137			5.52E-05	C C 2	Cm 244			8.10E-07	C C 1
Ba 133			1.36E-08	C C 2	Cm 245				8
La 137				8	Cm 246				8
La 138				8	Cm 248				8
Ce 144				8	Cf 249				8
Pm 145				8	Cf 250				8
Pm 147			3.87E-07	C C 1	Cf 251				8
Sm 147				8	Cf 252				8
Sm 151				8	Unsp a				
Eu 152			4.62E-08	C C 2	Unsp b/g				
Eu 154			1.54E-08	C C 2	Total a	0	*	5.80E-06	*
Eu 155			6.44E-09	C C 2	Total b/g	0	*	1.37E-04	*

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