

WASTE STREAM	3S08	Secondary Cartridge Filters (LLW)
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SITE Sizewell B

SITE OWNER EDF Energy Nuclear Generation Ltd (EDFE NGL)

WASTE CUSTODIAN EDF Energy Nuclear Generation Ltd (EDFE NGL)

WASTE TYPE LLW

WASTE VOLUMES

	Reported (m ³)	OR	Conditioned (m ³)	Packaged (m ³)
Stocks:	At 1.4.2025	= 3.4		
Future arisings:	1.4.2025 - 31.3.2026	= 0.3		
	1.4.2026 - 31.3.2027	= 0.3		
	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 - 31.3.2035	= 1.6		
	1.4.2035 - 31.3.2043	= 5.2		
Total future arisings:		8.4		
Total waste volume:		11.8		

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

Comment on arising rates: Waste volumes will be variable depending on station operating conditions. Following planned shutdown in 2035 and defuelling operations, the fuel storage ponds and associated plant will continue in operation for a number of years before removal of the last secondary cartridge filters.

Additional information on quantities: -

Uncertainty factors on volumes: Stock (upper): x 1.25 Arisings (upper): x 1.50
Stock (lower): x 0.75 Arisings (lower): x 0.50

WASTE SOURCE At Sizewell B Power Station, several systems process either primary or secondary coolant or liquid radwaste streams. These systems contain filters for cleanup of particulate contaminants.

PHYSICAL CHARACTERISTICS

General description: The wastes are spent filter cartridges that are composed principally of a stainless steel support with a glass fibre filter element and organic materials for binding.

Changes since waste generated: -

Bulk density (t/m³): = 4.3

Comment on density: Based on raw weight and volume in waste characterisation form.

CHEMICAL COMPOSITION

General description and components (%wt): Stainless steel (98%wt), glass fibre, binding materials (~2%).

Chemical state: Neutral

Sheet metal proportion / thickness: Overall dimensions for the filter are 200mm diameter by 500mm length. The filter has top and bottom discs that are connected by three rods and a metal gauze containing the filter matrix.

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	~ 98.0	304	
Other ferrous metals.....	= 0	-	
Iron.....	= 0	-	
Aluminium.....	TR	-	
Beryllium.....	= 0	-	
Cobalt.....	= 0	-	
Copper.....	TR	-	
Lead.....	= 0	-	
Magnox/Magnesium.....	= 0	-	
Nickel.....	-	-	
Titanium.....	= 0	-	
Uranium.....	= 0	-	
Zinc.....	TR	-	
Zircaloy/Zirconium.....	= 0	-	
Other metals.....	TR	-	

Organics (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulotics.....	= 0	-	
Paper, cotton.....	= 0	-	
Wood.....	= 0	-	
Halogenated plastics.....	= 1.0	-	
Total non-halogenated plastics.....	P	-	
Condensation polymers.....	0	-	
Others.....	0	-	
Organic ion exchange materials.....	NE	-	
Total rubber.....	= 0	-	
Halogenated rubber.....	= 0	-	
Non-halogenated rubber.....	= 0	-	
Hydrocarbons.....	= 0	-	
Oil or grease.....	= 0	-	
Fuel.....	-	-	
Asphalt/Tarmac (cont.coal tar).....	-	-	
Asphalt/Tarmac (no coal tar).....	-	-	
Bitumen.....	-	-	
Others.....	-	-	
Other organics.....	NE	-	

Other materials (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Inorganic ion exchange materials.....	TR	A small amount of Ion exchange resin (< 5 grams) could be present on filters from one slot, which is approximately 1kg over the life of the waste.	
Inorganic sludges and flocs.....	0	-	
Soil.....	0	-	
Brick/Stone/Rubble.....	0	-	
Cementitious material.....	0	-	
Sand.....	NE	-	
Glass/Ceramics.....	~ 1.0	-	
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.....	TR	-
Chloride.....	TR	-
Iodide.....	TR	-
Cyanide.....	NE	-
Carbonate.....	TR	-
Nitrate.....	TR	-
Nitrite.....	NE	-
Phosphate.....	TR	-
Sulphate.....	TR	-
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.....	NE	-
Benzene.....	NE	-
Chlorinated solvents.....	NE	-
Formaldehyde.....	NE	-
Organometallics.....	NE	-
Phenol.....	NE	-
Styrene.....	NE	-
Tri-butyl phosphate.....	NE	-
Other organophosphates.....	NE	-
Vinyl chloride.....	NE	-
Arsenic.....	NE	-
Barium.....	NE	-
Boron.....	NE	-
Boron (in Boral).....	NE	-
Boron (non-Boral).....	NE	-
Cadmium.....	NE	-
Caesium.....	NE	-
Selenium.....	NE	-
Chromium.....	NE	-
Molybdenum.....	NE	-
Thallium.....	NE	-
Tin.....	NE	-
Vanadium.....	NE	-
Mercury compounds.....	NE	-
Others.....	NE	-

Complexing agents (%wt):

No		
	(%wt)	Type(s) and comment
EDTA.....	NE	-
DPTA.....	NE	-
NTA.....	NE	-
Polycarboxylic acids.....	NE	-
Other organic complexants.....	NE	Not expected to be present.
Total complexing agents.....	= 0	-

Physical components:

	Number	Type(s) and comment
Sources.....	= 0	-
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 None	Off-site	= 100.0

Comments on planned treatments:

On removal from plant the filters are placed in a mild steel canister. Canisters and filter are loaded into half-height ISO containers with other LLW and encapsulated/grouted at LLWR.

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 IP-2 Disposal/Re-usable ISO (TC01/TC02)	100.0	20.0	18.3	1	-

Range in container waste loading: Nominal value entered for waste loading. Filters are loaded into cansiters and placed into interstitial spaces in HHISO of other waste streams (mainly 3S06 LLW resin that is encapsulated in drums).

Other information on packaging and conditioning: -

Conditioned density (t/m³): = 1.8

Conditioned density comment: Based on conditioned weight and volume in WCH.

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)	= 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: Secondary filter cartridges from various systems. There will be contamination by fission products and activation products.

Uncertainty: The activity values quoted are indicative of the activities expected. Indicative data. Uncertainty is large. Activity levels are expected to be low.

Measurement of radioactivities: Activity based on fingerprint of waste stream.

Chemical form of radionuclides: H-3: Will be present in any retained water. Activity expected to be very low.
C-14: Not expected to be present in any measurable quantity.
Cl-36: -
Se-79: -
Tc-99: -
I-129: -
Ra: Not expected to be present in any measurable quantity.
Th: -
U: Trace (value unknown but not thought to be significant), probably as salts.
Np: -
Pu: Trace (value unknown but not thought to be significant), probably as salts.

WASTE STREAM		3S08		Secondary Cartridge Filters (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	1.01E-02	C C 2	1.01E-02	C C 2	Gd 153	2.33E-06	C C 2	2.33E-06	C C 2
Be 10		8		8	Ho 163		8		8
C 14	1.94E-04	C C 2	1.94E-04	C C 2	Ho 166m		8		8
Na 22		8		8	Tm 170		8		8
Al 26		8		8	Tm 171		8		8
Cl 36		8		8	Lu 174		8		8
Ar 39		8		8	Lu 176		8		8
Ar 42		8		8	Hf 178n		8		8
K 40		8		8	Hf 182		8		8
Ca 41		8		8	Pt 193		8		8
Mn 53		8		8	Ti 204		8		8
Mn 54	4.90E-04	C C 2	4.90E-04	C C 2	Pb 205		8		8
Fe 55	9.73E-03	C C 2	9.73E-03	C C 2	Pb 210		8		8
Co 60	8.66E-03	C C 2	8.66E-03	C C 2	Bi 208		8		8
Ni 59		8		8	Bi 210m		8		8
Ni 63	5.08E-03	C C 2	5.08E-03	C C 2	Po 210		8		8
Zn 65	2.72E-05	C C 2	2.72E-05	C C 2	Ra 223		8		8
Se 79		8		8	Ra 225		8		8
Kr 81		8		8	Ra 226		8		8
Kr 85		8		8	Ra 228		8		8
Rb 87		8		8	Ac 227		8		8
Sr 90		8		8	Th 227		8		8
Zr 93		8		8	Th 228		8		8
Nb 91		8		8	Th 229		8		8
Nb 92		8		8	Th 230		8		8
Nb 93m		8		8	Th 232		8		8
Nb 94	7.76E-06	C C 2	7.76E-06	C C 2	Th 234		8		8
Mo 93		8		8	Pa 231		8		8
Tc 97		8		8	Pa 233		8		8
Tc 99		8		8	U 232		8		8
Ru 106		8		8	U 233		8		8
Pd 107		8		8	U 234	1.48E-05	C C 2	1.48E-05	C C 2
Ag 108m		8		8	U 235		8		8
Ag 110m		8		8	U 236		8		8
Cd 109		8		8	U 238		8		8
Cd 113m		8		8	Np 237		8		8
Sn 119m		8		8	Pu 236		8		8
Sn 121m		8		8	Pu 238	7.76E-07	C C 2	7.76E-07	C C 2
Sn 123		8		8	Pu 239	2.33E-06	C C 2	2.33E-06	C C 2
Sn 126		8		8	Pu 240	3.11E-06	C C 2	3.11E-06	C C 2
Sb 125	5.42E-04	C C 2	5.42E-04	C C 2	Pu 241	5.01E-04	C C 2	5.01E-04	C C 2
Sb 126		8		8	Pu 242		8		8
Te 125m		8		8	Am 241		8		8
Te 127m		8		8	Am 242m		8		8
I 129		8		8	Am 243		8		8
Cs 134	9.20E-04	C C 2	9.20E-04	C C 2	Cm 242		8		8
Cs 135		8		8	Cm 243		8		8
Cs 137	1.35E-02	C C 2	1.35E-02	C C 2	Cm 244		8		8
Ba 133		8		8	Cm 245		8		8
La 137		8		8	Cm 246		8		8
La 138		8		8	Cm 248		8		8
Ce 144	3.88E-06	C C 2	3.88E-06	C C 2	Cf 249		8		8
Pm 145		8		8	Cf 250		8		8
Pm 147	3.11E-06	C C 2	3.11E-06	C C 2	Cf 251		8		8
Sm 147		8		8	Cf 252		8		8
Sm 151		8		8	Unsp a		8		8
Eu 152		8		8	Unsp b/g	6.09E-04	C C 2	6.09E-04	C C 2
Eu 154		8		8	Total a	2.10E-05	*	2.10E-05	*
Eu 155		8		8	Total b/g	5.04E-02	*	5.04E-02	*

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