WASTE STREAM 2D55 Stored Filters

SITE	Sellafield
SITE OWNER	Nuclear Decommissioning Authority
WASTE CUSTODIAN	Sellafield Limited
WASTE TYPE	ILW

WASTE VOLUMES

		Reported
Stocks:	At 1.4.2019.....	14.0 m³
Total future arisings:		0 m³
Total waste volume:		14.0 m³

Comment on volumes: There are no future arisings of filters, but there may be some operational waste generated when filters are removed. These filters are being stored in the First Generation Reprocessing Plant. It is anticipated that the filters will not be removed and treated until around 2050.

Uncertainty factors on volumes:				
	Stock (upper):	x 1.1	Arisings (upper)	x
	Stock (lower):	x 0.9	Arisings (lower)	x

WASTE SOURCE Filters from District Hazard Filter Room.

PHYSICAL CHARACTERISTICS

General description:	Cotton-reinforced blue asbestos filter units. The filters are large. Dimensions of units: 4'6" long, 3'8" wide, 2'2" high.
Physical components (%vol):	14 filter units consisting of steel frames and each frame containing six 'Porton-type' filter inserts.
Sealed sources:	The waste does not contain sealed sources.
Bulk density (t/m³):	NE
Comment on density:	The density has not been estimated by Sellafield Ltd.

CHEMICAL COMPOSITION

General description and components (%wt):	Mild steel; cotton re-inforced blue asbestos. Fission product and uranium contamination, probably as oxides. Percentages not estimated, mostly steel.
Chemical state:	Neutral
Chemical form of radionuclides:	H-3: Not likely to be present. C-14: Not likely to be present. Cl-36: Not likely to be present. Se-79: Not likely to be present. Tc-99: Not likely to be present. I-129: Not likely to be present. Ra: Not likely to be present. Th: Not likely to be present. U: Probably present as oxides. Np: Not likely to be present. Pu: Not estimated.
Metals and alloys (%wt):	Filters sizes are nominally 4' 6"x 3' 8"x 2' 6". Steel comprises frames for filters.

Stainless steel.....	0
Other ferrous metals.....	P
Iron.....	
Aluminium.....	0
Beryllium.....	0
Cobalt.....	0
Copper.....	0
Lead.....	0
Magnox/Magnesium.....	0

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	Nickel	0
	Titanium	
	Uranium	P
	Zinc	0
	Zircaloy/Zirconium	0
	Other metals	0
Organics (%wt):	Cotton re-inforced blue asbestos and "rubazote" as 1/4" thick rubber seals are present.	
	Total cellulosics	P
	Paper, cotton	P
	Wood	0
	Halogenated plastics	0
	Total non-halogenated plastics	0
	Condensation polymers	0
	Others	0
	Organic ion exchange materials	0
	Total rubber	NE
	Halogenated rubber	0
	Non-halogenated rubber	P
	Hydrocarbons	
	Oil or grease	
	Fuel	
	Asphalt/Tarmac (cont.coal tar)	
	Asphalt/Tarmac (no coal tar)	
	Bitumen	
	Others	
	Other organics	P
Other materials (%wt):	-	
	Inorganic ion exchange materials.	0
	Inorganic sludges and flocs	0
	Soil	0
	Brick/Stone/Rubble	0
	Cementitious material	0
	Sand	
	Glass/Ceramics	0
	Graphite	0
	Desiccants/Catalysts	
	Asbestos	P
	Non/low friable	
	Moderately friable	
	Highly friable	
	Free aqueous liquids	0
	Free non-aqueous liquids	0
	Powder/Ash	0

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Inorganic anions (%wt): Inorganic anions are not expected to be present.

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: Blue asbestos is present.

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
Active particles	NE
Soluble solids as bulk chemical compounds	NE

Hazardous substances / non hazardous pollutants: Very low quantities of lead primer paint are possible. Blue asbestos.

Acrylamide	
Benzene	NE
Chlorinated solvents	
Formaldehyde	
Organometallics	
Phenol	NE
Styrene	
Tri-butyl phosphate	NE
Other organophosphates	
Vinyl chloride	NE
Arsenic	NE
Barium	

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	Boron..... NE	
	Cadmium..... NE	
	Caesium.....	
	Selenium..... NE	
	Chromium..... NE	
	Molybdenum..... NE	
	Thallium.....	
	Tin..... NE	
	Vanadium..... NE	
	Mercury compounds.....	
	Others..... NE	
	Electronic Electrical Equipment (EEE)	
	EEE Type 1.....	
	EEE Type 2.....	
	EEE Type 3.....	
	EEE Type 4.....	
	EEE Type 5.....	
Complexing agents (%wt):	Not yet determined	
	EDTA.....	
	DPTA.....	
	NTA.....	
	Polycarboxylic acids……	
	Other organic complexants..... NE	Complexing agents not likely to be present, but this has not been assessed.
	Total complexing agents..... NE	

PACKAGING AND CONDITIONING

Conditioning method:	The conditioning method has not yet been determined.
Plant Name:	Not yet determined.
Location:	Sellafield.
Plant startup date:	-
Total capacity (m^3/y incoming waste):	-
Target start date for packaging this stream:	-
Throughput for this stream (m^3/y incoming waste):	-
Other information:	Not yet determined.

Likely container type:

Container	Waste packaged (%vol)	Waste loading (m^3)	Payload (m^3)	Number of packages
Sellafield 3m^3 box	100.0	2.7	2.7	6

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Likely container type comment:	-
Range in container waste volume:	-
Other information on containers:	Not yet determined.
Likely conditioning matrix:	Not specified
Other information:	-
Conditioned density (t/m³):	NE
Conditioned density comment:	-
Other information on conditioning:	-
Opportunities for alternative disposal routing:	Not yet determined

Treatment	Stream volume (%)	Comment
-	-	-

RADIOACTIVITY

Source:	Cs-137/Ba-137m, Sr-90/Y-90, Co-60, Eu-154, Eu-155, U, Pu and Am isotopes collected on filters.
Uncertainty:	The activity has not been estimated.
Definition of total alpha and total beta/gamma:	No total alpha or beta/gamma activities calculated.
Measurement of radioactivities:	-
Other information:	-

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Nuclide	Mean radioactivity, TBq/m³				Nuclide	Mean radioactivity, TBq/m³			
	Waste at 1.4.2019	Bands and Code	Future arisings	Bands and Code		Waste at 1.4.2019	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				
Co 60		6			Bi 208				
Ni 59					Bi 210m				
Ni 63					Po 210				
Zn 65					Ra 223				
Se 79					Ra 225				
Kr 81					Ra 226				
Kr 85					Ra 228				
Rb 87					Ac 227				
Sr 90		6			Th 227				
Zr 93					Th 228				
Nb 91					Th 229				
Nb 92					Th 230				
Nb 93m					Th 232				
Nb 94					Th 234				
Mo 93					Pa 231				
Tc 97					Pa 233				
Tc 99					U 232				
Ru 106					U 233				
Pd 107					U 234				
Ag 108m					U 235		6		
Ag 110m					U 236				
Cd 109					U 238		6		
Cd 113m					Np 237				
Sn 119m					Pu 236				
Sn 121m					Pu 238		6		
Sn 123					Pu 239		6		
Sn 126					Pu 240		6		
Sb 125					Pu 241		6		
Sb 126					Pu 242		6		
Te 125m					Am 241		6		
Te 127m					Am 242m		6		
I 129					Am 243				
Cs 134					Cm 242				
Cs 135					Cm 243				
Cs 137		6			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					Other a				
Eu 152					Other b/g				
Eu 154		6			**Total a**	**NE**		**0**	
Eu 155		6			**Total b/g**	**NE**		**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 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