



**WASTE STREAM****3L24 Bypass Blowdown Filters**

	Nickel.....	0
	Titanium.....	0
	Uranium.....	0
	Zinc.....	0
	Zircaloy/Zirconium.....	0
	Other metals.....	0
Organics (%wt):	-	
	Total cellulose.....	0
	Paper, cotton.....	
	Wood.....	
	Halogenated plastics .....	0
	Total non-halogenated plastics.....	0
	Condensation polymers.....	
	Others.....	
	Organic ion exchange materials....	0
	Total rubber.....	0
	Halogenated rubber .....	
	Non-halogenated rubber.....	
	Hydrocarbons.....	0
	Oil or grease .....	
	Fuel.....	
	Asphalt/Tarmac (cont.coal tar)...	
	Asphalt/Tarmac (no coal tar)....	
	Bitumen.....	
	Others.....	
	Other organics.....	0
Other materials (%wt):	-	
	Inorganic ion exchange materials.	0
	Inorganic sludges and flocs.....	0
	Soil.....	0
	Brick/Stone/Rubble.....	0
	Cementitious material.....	0
	Sand.....	0
	Glass/Ceramics.....	0
	Graphite.....	TR
	Desiccants/Catalysts.....	0
	Asbestos.....	0
	Non/low friable.....	
	Moderately friable.....	
	Highly friable.....	
	Free aqueous liquids.....	0
	Free non-aqueous liquids.....	0
	Powder/Ash.....	0

**WASTE STREAM****3L24 Bypass Blowdown Filters**

## Inorganic anions (%wt):

-	
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:

-	
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.....	P
Soluble solids as bulk chemical compounds.....	0

May be present

## Hazardous substances / non hazardous pollutants:

-	
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

**WASTE STREAM**

**3L24 Bypass Blowdown Filters**

Boron..... NE  
 Cadmium..... NE  
 Caesium..... NE  
 Selenium..... NE  
 Chromium..... NE  
 Molybdenum..... NE  
 Thallium..... NE  
 Tin..... NE  
 Vanadium..... NE  
 Mercury compounds..... NE  
 Others..... NE  
 Electronic Electrical Equipment (EEE)  
     EEE Type 1..... 0  
     EEE Type 2..... 0  
     EEE Type 3..... 0  
     EEE Type 4..... 0  
     EEE Type 5..... 0

Complexing agents (%wt):

No  
 EDTA..... NE  
 DPTA..... NE  
 NTA..... NE  
 Polycarboxylic acids..... NE  
 Other organic complexants..... NE  
 Total complexing agents..... 0

**LAW TREATMENT, PACKAGING AND DISPOSAL**

**Waste that is currently ILW:** Waste filters are ILW but can be decay stored and then decontaminated off site to become LLW. The time taken for the waste to become LLW is varied.

Planned on-site / off-site treatments(s):

Treatment	On-site / Off site	Stream volume %
Low force compaction	On-site	100.0
Supercompaction (HFC)		
Incineration		
Solidification		
Decontamination		
Metal treatment		
Size reduction		
Decay storage		
Recycling / reuse		
Other / various		
None		

Comment on planned treatments:

-

**WASTE STREAM****3L24 Bypass Blowdown Filters**

Disposal Routes:	Disposal Route	Stream volume %
		Expected to be consigned to the LLW Repository Expected to be consigned to a Landfill Facility Expected to be consigned to an On-Site Disposal Facility Expected to be consigned to an Incineration Facility Expected to be consigned to a Metal Treatment Facility Expected to be consigned as Out of Scope Expected to be recycled / reused Disposal route not known

**Upcoming (2019/20-2021/22) waste routing (if expected to change from above)**

Disposal Route	Stream volume %		
	2019/20	2020/21	2021/22
Expected to be consigned to the LLW Repository Expected to be consigned to a Landfill Facility Expected to be consigned to an On-Site Disposal Facility Expected to be consigned to an Incineration Facility Expected to be consigned to a Metal Treatment Facility Expected to be consigned as Out of Scope Expected to be recycled / reused Disposal route not known			

**Waste Packaging for Disposal:**

Container	Stream volume %	Waste loading m <sup>3</sup>	Number of packages
1/3 Height IP-1 ISO 2/3 Height IP-2 ISO 1/2 Height WAMAC IP-2 ISO 1/2 Height IP-2 Disposal/Re-usable ISO 2m box (no shielding) 4m box (no shielding) Other	100.0	~11.2	2

Other information: Waste is transported to an off-site treatment facility (Inutec) for treatment and disposal as LLW.

**Waste Consigned to the LLW Repository:**

Container voidage: -

Waste Characterisation Form (WCH): The waste does not meet the LLWR's Waste Acceptance Criteria (WAC).  
Awaiting decay storage to radionuclide activity levels suitable for disposal to LLWR.

Waste consigned for disposal to LLWR in year of generation: No. Stored safely for decay storage prior to disposal.

Potential for the waste to contain discrete items: Yes

**Non-Containerised Waste for In-Vault Grouting:** (Not applicable to this waste stream)

Stream volume (%): -

Waste stream variation: -

Bounding cuboidal volume:

Inaccessible voidage: -

**WASTE STREAM****3L24****Bypass Blowdown Filters**

Other information:

-

**RADIOACTIVITY**

Source:

Contamination by activation products will be the main source of activity.

Uncertainty:

Specific activity is a function of station operating history. The values quoted are indicative of the activities that might be expected.

Definition of total alpha and total beta/gamma:

Where totals are shown on the table of radionuclide activities they are the sums of the listed alpha or beta/gamma emitting radionuclides plus 'other alpha' or 'other beta/gamma'.

Measurement of radioactivities:

A combination of sample analysis and theoretical assessments. The specific activities stated for future arisings are typical values for a filter at the time of arising.

Other information:

-

**WASTE STREAM 3L24 Bypass Blowdown Filters**

Nuclide	Mean radioactivity, TBq/m <sup>3</sup>				Nuclide	Mean radioactivity, TBq/m <sup>3</sup>			
	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	5.11E-03	CC 2	6.76E-03	CC 2	Gd 153				
Be 10					Ho 163				
C 14	4.32E-04	CC 2	4.32E-04	CC 2	Ho 166m				
Na 22		4		4	Tm 170				
Al 26		4		4	Tm 171				
Cl 36	2.64E-03	CC 2	2.64E-03	CC 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	5.49E-05	CC 2	3.15E-03	CC 2	Pb 205				
Fe 55	1.51E-02	CC 2	5.44E-02	CC 2	Pb 210				
Co 60	2.22E-03	CC 2	4.28E-03	CC 2	Bi 208				
Ni 59					Bi 210m				
Ni 63	1.74E-03	CC 2	1.80E-03	CC 2	Po 210				
Zn 65	2.55E-06	CC 2	4.54E-04	CC 2	Ra 223				
Se 79					Ra 225				
Kr 81					Ra 226				
Kr 85					Ra 228				
Rb 87					Ac 227				
Sr 90	7.21E-05	CC 2	8.12E-05	CC 2	Th 227				
Zr 93					Th 228				
Nb 91					Th 229				
Nb 92					Th 230				
Nb 93m					Th 232				
Nb 94	8.99E-06	CC 2	8.99E-06	CC 2	Th 234				
Mo 93					Pa 231				
Tc 97					Pa 233				
Tc 99					U 232				
Ru 106	1.92E-06	CC 2	5.93E-05	CC 2	U 233				
Pd 107					U 234	2.78E-09	CC 2	2.78E-09	CC 2
Ag 108m	8.07E-06	CC 2	8.13E-06	CC 2	U 235	4.42E-11	CC 2	4.42E-11	CC 2
Ag 110m	1.03E-07	CC 2	1.63E-05	CC 2	U 236	7.11E-10	CC 2	7.11E-10	CC 2
Cd 109					U 238	8.26E-10	CC 2	8.26E-10	CC 2
Cd 113m					Np 237				
Sn 119m					Pu 236				
Sn 121m					Pu 238	1.64E-07	CC 2	1.70E-07	CC 2
Sn 123					Pu 239		6		6
Sn 126					Pu 240	<2.87E-07	C 3	<2.87E-07	C 3
Sb 125	4.45E-06	CC 2	1.58E-05	CC 2	Pu 241	1.26E-05	CC 2	1.61E-05	CC 2
Sb 126					Pu 242				
Te 125m					Am 241	4.41E-07	CC 2	4.44E-07	CC 2
Te 127m					Am 242m				
I 129	3.30E-11	CC 2	3.30E-11	CC 2	Am 243				
Cs 134	2.5E-05	CC 2	1.35E-04	CC 2	Cm 242	5.39E-11	CC 2	1.28E-07	CC 2
Cs 135					Cm 243		6		6
Cs 137	1.17E-04	CC 2	1.32E-04	CC 2	Cm 244	<2.35E-08	C 3	<2.64E-08	C 3
Ba 133					Cm 245				
La 137					Cm 246				
La 138					Cm 248				
Ce 144	3.40E-07	CC 2	2.89E-05	CC 2	Cf 249				
Pm 145					Cf 250				
Pm 147	3.86E-06	CC 2	1.45E-05	CC 2	Cf 251				
Sm 147					Cf 252				
Sm 151					Other a		8		8
Eu 152	1.12E-05	CC 2	1.46E-05	CC 2	Other b/g	5.00E-06	CC 2	4.65E-02	CC 2
Eu 154	7.44E-06	CC 2	1.11E-05	CC 2	<b>Total a</b>	<b>9.19E-07</b>	<b>CC 2</b>	<b>1.06E-06</b>	<b>CC 2</b>
Eu 155	4.68E-06	CC 2	9.42E-06	CC 2	<b>Total b/g</b>	<b>2.75E-02</b>	<b>CC 2</b>	<b>1.21E-01</b>	<b>CC 2</b>

**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