

WASTE STREAM**9B87/C****Miscellaneous Contaminated Items**

Copper..... NE
 Lead..... NE
 Magnox/Magnesium..... ~10.0
 Nickel.....
 Titanium.....
 Uranium.....
 Zinc..... NE
 Zircaloy/Zirconium..... NE
 Other metals..... NE

The presence of "other" metals has not been assessed.

Organics (%wt):

The quantities of organic materials have not been assessed but plastics will be present. PVC may be present in trace quantities.

Total cellulosics..... NE
 Paper, cotton..... NE
 Wood..... NE
 Halogenated plastics NE
 Total non-halogenated plastics..... NE
 Condensation polymers..... NE
 Others..... NE
 Organic ion exchange materials.... 0
 Total rubber..... NE
 Halogenated rubber NE
 Non-halogenated rubber..... NE
 Hydrocarbons.....
 Oil or grease
 Fuel.....
 Asphalt/Tarmac (cont.coal tar)...
 Asphalt/Tarmac (no coal tar)....
 Bitumen.....
 Others.....
 Other organics..... NE

Other materials (%wt):

-
 Inorganic ion exchange materials. 1.0
 Inorganic sludges and flocs..... ~13.0
 Soil..... 0
 Brick/Stone/Rubble..... ~19.0
 Cementitious material..... 0
 Sand..... ~8.0
 Glass/Ceramics..... 0
 Graphite..... NE
 Desiccants/Catalysts.....
 Asbestos..... NE
 Non/low friable.....
 Moderately friable.....

	Highly friable.....	
	Free aqueous liquids.....	0
	Free non-aqueous liquids.....	0
	Powder/Ash.....	P
Inorganic anions (%wt):	None of the listed inorganic anions are expected to be present at greater than 1%.	
	Fluoride.....	<1.0
	Chloride.....	<1.0
	Iodide.....	<1.0
	Cyanide.....	0
	Carbonate.....	<1.0
	Nitrate.....	<1.0
	Nitrite.....	<1.0
	Phosphate.....	<1.0
	Sulphate.....	<1.0
	Sulphide.....	<1.0
Materials of interest for waste acceptance criteria:	No materials likely to pose a fire or other non-radiological hazard have been identified.	
	Combustible metals.....	NE
	Low flash point liquids.....	0
	Explosive materials.....	0
	Phosphorus.....	0
	Hydrides.....	0
	Biological etc. materials.....	NE
	Biodegradable materials.....	
	Putrescible wastes.....	0
	Non-putrescible wastes.....	
	Corrosive materials.....	NE
	Pyrophoric materials.....	0
	Generating toxic gases.....	NE
	Reacting with water.....	NE
	Active particles.....	
	Soluble solids as bulk chemical compounds.....	
Hazardous substances / non hazardous pollutants:	-	
	Acrylamide.....	
	Benzene.....	
	Chlorinated solvents.....	
	Formaldehyde.....	
	Organometallics.....	
	Phenol.....	
	Styrene.....	
	Tri-butyl phosphate.....	

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Other organophosphates.....

Vinyl chloride.....

Arsenic.....

Barium.....

Boron.....

Cadmium.....

Caesium.....

Selenium.....

Chromium.....

Molybdenum.....

Thallium.....

Tin.....

Vanadium.....

Mercury compounds.....

Others.....

Electronic Electrical Equipment (EEE)

EEE Type 1.....

EEE Type 2.....

EEE Type 3.....

EEE Type 4.....

EEE Type 5.....

Complexing agents (%wt):

EDTA.....

DPTA.....

NTA.....

Polycarboxylic acids.....

Other organic complexants.....

Total complexing agents..... TR

PACKAGING AND CONDITIONING

Container type:	Container	Waste packaged (%vol)	Waste loading (m ³)	Payload (m ³)	Number of packages
	500 l RS drum (0mm Pb)	100.0	0.27	0.27	2

Container type comment: -

Range in container waste volume: No significant variability is expected.

Other information on containers: The container material is cast iron.

Conditioned density (t/m³): -

Conditioned density comment: -

Other information on conditioning: -

RADIOACTIVITY

Source:	The waste usually arises from the irradiated fuel handling, active filtration systems and pond operations. Components that have been associated with fuel pond operations and waste from the primary gas circuits are likely to be of high activity.
Uncertainty:	Specific activities of both waste packages were determined using gamma spectroscopy and fingerprints. The above values (Tbq/m ³) are representative of the waste across the packages and each package's specific activity falls within the quoted uncertainty bands.
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:	Specific activities of both waste packages were measured and derived using gamma spectroscopy and the application of fingerprints.
Other information:	-

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Nuclide	Mean radioactivity, TBq/m ³				Nuclide	Mean radioactivity, TBq/m ³			
	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	2.02E-02	CC 2			Gd 153		8		
Be 10		8			Ho 163		8		
C 14	5.8E-04	CC 2			Ho 166m	2.6E-07	CC 2		
Na 22		8			Tm 170		8		
Al 26		8			Tm 171	3.67E-08	CC 2		
Cl 36	4.61E-09	CC 2			Lu 174		8		
Ar 39	3.41E-05	CC 2			Lu 176		8		
Ar 42	1.03E-09	CC 2			Hf 178n	5.46E-07	CC 2		
K 40		8			Hf 182		8		
Ca 41	1.24E-05	CC 2			Pt 193	2.15E-05	CC 2		
Mn 53		8			Tl 204	5.87E-07	CC 2		
Mn 54	1.65E-09	CC 2			Pb 205		8		
Fe 55	2.2E-03	CC 2			Pb 210		8		
Co 60	1.97E-03	BB 1			Bi 208		8		
Ni 59	8.9E-06	CC 2			Bi 210m		8		
Ni 63	5.39E-03	CC 2			Po 210		8		
Zn 65	1.06E-09	CC 2			Ra 223		8		
Se 79		8			Ra 225		8		
Kr 81		8			Ra 226		8		
Kr 85	6.35E-05	CC 2			Ra 228		8		
Rb 87		8			Ac 227		8		
Sr 90	6.87E-04	CC 2			Th 227		8		
Zr 93	5.87E-07	CC 2			Th 228	6.21E-08	CC 2		
Nb 91		8			Th 229		8		
Nb 92		8			Th 230	6.21E-09	CC 2		
Nb 93m	9.57E-07	CC 2			Th 232		8		
Nb 94	5.89E-08	CC 2			Th 234	1E-05	CC 2		
Mo 93	1.7E-09	CC 2			Pa 231		8		
Tc 97		8			Pa 233	1.22E-06	CC 2		
Tc 99	1.79E-09	CC 2			U 232	6.06E-08	CC 2		
Ru 106	4.25E-08	CC 2			U 233	1.17E-07	CC 2		
Pd 107	2.13E-09	CC 2			U 234	2.85E-05	CC 2		
Ag 108m	6.73E-06	CC 2			U 235	7.54E-07	CC 2		
Ag 110m		8			U 236	2.78E-06	CC 2		
Cd 109	9.84E-09	CC 2			U 238	1E-05	CC 2		
Cd 113m	1.79E-07	CC 2			Np 237	1.22E-06	CC 2		
Sn 119m		8			Pu 236	3.48E-09	CC 2		
Sn 121m	2.74E-08	CC 2			Pu 238	2.11E-03	CC 2		
Sn 123		8			Pu 239	3.82E-03	CC 2		
Sn 126	7.93E-09	CC 2			Pu 240	3.79E-03	CC 2		
Sb 125	2.26E-06	CC 2			Pu 241	5.02E-02	CC 2		
Sb 126	1.11E-09	CC 2			Pu 242	5.03E-06	CC 2		
Te 125m	5.66E-07	CC 2			Am 241	2.75E-04	CC 2		
Te 127m		8			Am 242m	3.25E-05	CC 2		
I 129		8			Am 243	9.46E-06	CC 2		
Cs 134	5.82E-07	CC 2			Cm 242	2.66E-05	CC 2		
Cs 135	1.59E-08	CC 2			Cm 243	3.7E-06	CC 2		
Cs 137	1.45E-03	BB 1			Cm 244	6.08E-05	CC 2		
Ba 133	1.23E-05	CC 2			Cm 245	4.02E-09	CC 2		
La 137		8			Cm 246		8		
La 138		8			Cm 248		8		
Ce 144	3.43E-09	CC 2			Cf 249		8		
Pm 145		8			Cf 250		8		
Pm 147	1.65E-05	CC 2			Cf 251		8		
Sm 147		8			Cf 252		8		
Sm 151	2.28E-05	CC 2			Other a				
Eu 152	5.63E-07	CC 2			Other b/g				
Eu 154	2.05E-05	CC 2			Total a	1.01E-02	CC 2	0	
Eu 155	3.31E-06	CC 2			Total b/g	8.30E-02	CC 2	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