



**WASTE STREAM**

**2S308/C**

**Conditioned WAGR Decommissioning ILW**

	Uranium.....	P
	Zinc.....	0
	Zircaloy/Zirconium.....	0
	Other metals.....	0
Organics (%wt):	Low levels of organic superplasticisers present in high density grout and cement.	
	Total cellulosics.....	0
	Paper, cotton.....	0
	Wood.....	0
	Halogenated plastics .....	0
	Total non-halogenated plastics.....	0
	Condensation polymers.....	0
	Others.....	0
	Organic ion exchange materials....	0
	Total rubber.....	0
	Halogenated rubber .....	0
	Non-halogenated rubber.....	0
	Hydrocarbons.....	
	Oil or grease .....	
	Fuel.....	
	Asphalt/Tarmac (cont.coal tar)...	
	Asphalt/Tarmac (no coal tar)....	
	Bitumen.....	
	Others.....	
	Other organics.....	TR
Other materials (%wt):	-	
	Inorganic ion exchange materials.	0
	Inorganic sludges and flocs.....	0
	Soil.....	0
	Brick/Stone/Rubble.....	0
	Cementitious material.....	58.0
	Sand.....	
	Glass/Ceramics.....	0
	Graphite.....	11.0
	Desiccants/Catalysts.....	
	Asbestos.....	P
	Non/low friable.....	
	Moderately friable.....	
	Highly friable.....	
	Free aqueous liquids.....	0
	Free non-aqueous liquids.....	0
	Powder/Ash.....	0
Inorganic anions (%wt):	Anions only present as components of cement grouts.	

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Fluoride.....	0
Chloride.....	0
Iodide.....	0
Cyanide.....	0
Carbonate.....	P
Nitrate.....	0
Nitrite.....	0
Phosphate.....	0
Sulphate.....	P
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.....	NE
Putrescible wastes.....	0
Non-putrescible wastes.....	NE
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:

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

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

**PACKAGING AND CONDITIONING**

Container type:	Container	Waste packaged (%vol)	Waste loading (m <sup>3</sup> )	Payload (m <sup>3</sup> )	Number of packages
	6m <sup>3</sup> concrete box (SD)	100.0	5.76	5.76	107

Container type comment: -

Range in container waste volume: -

Other information on containers: Normal density concrete containers conventional OPC (>2.35 t/m<sup>3</sup>); and high density magnetite concrete (>3.82 t/m<sup>3</sup>) used according to shielding requirements. The concrete is reinforced with steel bars.

Conditioned density (t/m<sup>3</sup>): 2.73

Conditioned density comment: -

Other information on conditioning: -

**RADIOACTIVITY**

Source: Activation of reactor components. Minor contamination with volatile fission products (Cs137).

Uncertainty: -

Definition of total alpha and total beta/gamma: .

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Measurement of  
radioactivities:

Gamma spectrometry used on waste items/ baskets to measure Co60. Other isotopes  
calculated from fingerprints derived from neutronics codes. Supplemented by Cs137  
analysis.

Other information:

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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	1.10E-02	AA 2	5.01E-03	AA 2	Gd 153				
Be 10					Ho 163				
C 14	6.04E-03	AA 2	6.03E-03	AA 2	Ho 166m				
Na 22					Tm 170				
Al 26					Tm 171				
Cl 36	1.14E-04	AA 2	1.14E-04	AA 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	6.05E-13	AB 2	7.09E-18	AA 2	Pb 205				
Fe 55	5.47E-03	AA 2	1.62E-04	AA 2	Pb 210				
Co 60	4.78E-02	AA 1	7.60E-03	AA 2	Bi 208				
Ni 59					Bi 210m				
Ni 63	9.84E-01	AA 2	8.92E-01	AA 2	Po 210				
Zn 65					Ra 223				
Se 79					Ra 225				
Kr 81					Ra 226				
Kr 85					Ra 228				
Rb 87					Ac 227				
Sr 90					Th 227				
Zr 93					Th 228				
Nb 91					Th 229				
Nb 92					Th 230				
Nb 93m					Th 232				
Nb 94	1.34E-04	AA 2	1.34E-04	AA 2	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				
Ag 110m					U 236				
Cd 109					U 238				
Cd 113m					Np 237				
Sn 119m					Pu 236				
Sn 121m					Pu 238				
Sn 123					Pu 239				
Sn 126					Pu 240				
Sb 125					Pu 241				
Sb 126					Pu 242				
Te 125m					Am 241				
Te 127m					Am 242m				
I 129					Am 243				
Cs 134					Cm 242				
Cs 135					Cm 243				
Cs 137	3.57E-04	AA 2	2.59E-04	AA 2	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	1.36E-06	AA 2	6.70E-07	AA 2	Other b/g				
Eu 154	2.98E-04	AA 2	9.61E-05	AA 2	<b>Total a</b>	<b>0</b>		<b>0</b>	
Eu 155					<b>Total b/g</b>	<b>1.06E+00</b>	<b>AA 2</b>	<b>9.11E-01</b>	<b>AA 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