

WASTE STREAM	9E17	Sludge
---------------------	-------------	---------------

Stainless steel.....	TR
Other ferrous metals.....	TR
Iron.....	
Aluminium.....	0.61
Beryllium.....	0
Cobalt.....	
Copper.....	0.02
Lead.....	<0.01
Magnox/Magnesium.....	TR
Nickel.....	
Titanium.....	
Uranium.....	
Zinc.....	0.06
Zircaloy/Zirconium.....	TR
Other metals.....	TR

Only trace quantities expected, if any.

Organics (%wt):

Oil and grease will be present, probably at between 10 and 15% wt. Halogenated plastics or rubbers will not be present.

Total cellulose.....	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.....	~15.0
Oil or grease	~15.0
Fuel.....	
Asphalt/Tarmac (cont.coal tar)...	
Asphalt/Tarmac (no coal tar)....	
Bitumen.....	
Others.....	

Other materials (%wt):

Traces of graphite may be present.	
Inorganic ion exchange materials.	0
Inorganic sludges and flocs.....	~~35.0
Soil.....	0
Brick/Stone/Rubble.....	0
Cementitious material.....	
Sand.....	NE

WASTE STREAM**9E17****Sludge**

	Glass/Ceramics.....	0
	Graphite.....	TR
	Desiccants/Catalysts.....	
	Asbestos.....	0
	Non/low friable.....	
	Moderately friable.....	
	Highly friable.....	
	Free aqueous liquids.....	~50.0
	Free non-aqueous liquids.....	TR
	Powder/Ash.....	0
Inorganic anions (%wt):	Not fully assessed. Carbonates may be present.	
	Fluoride.....	TR
	Chloride.....	<0.01
	Iodide.....	TR
	Cyanide.....	0
	Carbonate.....	1.2
	Nitrate.....	TR
	Nitrite.....	TR
	Phosphate.....	TR
	Sulphate.....	0.63
	Sulphide.....	TR
Materials of interest for waste acceptance criteria:	The waste is unlikely to present a fire hazard. There might be trace quantities of biological material.	
	Combustible metals.....	TR
	Low flash point liquids.....	0
	Explosive materials.....	0
	Phosphorus.....	0
	Hydrides.....	0
	Biological etc. materials.....	TR
	Biodegradable materials.....	
	Putrescible wastes.....	0
	Non-putrescible wastes.....	
	Corrosive materials.....	0
	Pyrophoric materials.....	0
	Generating toxic gases.....	NE
	Reacting with water.....	TR
	Active particles.....	
	Soluble solids as bulk chemical compounds.....	
Hazardous substances / non hazardous pollutants:	None expected.	
	Acrylamide.....	
	Benzene.....	

WASTE STREAM**9E17****Sludge**

Chlorinated solvents.....
 Formaldehyde.....
 Organometallics.....
 Phenol.....
 Styrene.....
 Tri-butyl phosphate.....
 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): Yes
 EDTA.....
 DPTA.....
 NTA.....
 Polycarboxylic acids.....
 Other organic complexants.....
 Total complexing agents..... TR

PACKAGING AND CONDITIONING

Conditioning method: -
 Plant Name: -
 Location: Oldbury Power Station
 Plant startup date: -
 Total capacity (m³/y incoming waste): ~100.0
 Target start date for packaging this stream: 2020

WASTE STREAM	9E17	Sludge
---------------------	-------------	---------------

Throughput for this stream (m³/y incoming waste): -

Other information: -

Likely container type:	Container	Waste packaged (%vol)	Waste loading (m ³)	Payload (m ³)	Number of packages
	3m ³ RS box	100.0	7.63	2.5	3

Likely container type comment: Waste will be transferred to a Type VI yellow box and dried.

Range in container waste volume: -

Other information on containers: -

Likely conditioning matrix: -

Other information: -

Conditioned density (t/m³): -

Conditioned density comment: -

Other information on conditioning: -

Opportunities for alternative disposal routing:

Treatment	Stream volume (%)	Comment
-	-	-

RADIOACTIVITY

Source: Sludge contains fission products, activation products and actinides from filtration of effluents and liquors.

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: The activities quoted were derived from available measurements.

Other information: -

WASTE STREAM 9E17 Sludge

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	1.31E-03	CC 2	2.84E-03	CC 2	Gd 153		8		8
Be 10		8		8	Ho 163		8		8
C 14	2E-04	CC 2	2E-04	CC 2	Ho 166m		8		8
Na 22		8		8	Tm 170		8		8
Al 26	5E-07	CC 2	5E-07	CC 2	Tm 171		8		8
Cl 36	2E-07	CC 2	2E-07	CC 2	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	Tl 204		8		8
Mn 54		8		8	Pb 205		8		8
Fe 55	2.66E-05	CC 2	3.88E-04	CC 2	Pb 210		8		8
Co 60	4.4E-05	CC 2	2.63E-04	CC 2	Bi 208		8		8
Ni 59		8		8	Bi 210m		8		8
Ni 63	8.56E-05	CC 2	9.93E-05	CC 2	Po 210		8		8
Zn 65	9.37E-08	CC 8	1.42E-05	CC 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	3.42E-04	CC 2	5.86E-04	CC 2	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		8		8	Th 234	6E-08	CC 2	6E-08	CC 2
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	9.05E-08	CC 2	9.01E-08	CC 2
Ag 108m	1.97E-06	CC 2	2E-06	CC 2	U 235		8		8
Ag 110m		8		8	U 236	<4E-09	C 3	<4E-09	C 3
Cd 109		8		8	U 238	6E-08	CC 2	6E-08	CC 2
Cd 113m		8		8	Np 237		8		8
Sn 119m		8		8	Pu 236		8		8
Sn 121m		8		8	Pu 238	1.87E-05	CC 2	1.99E-05	CC 2
Sn 123		8		8	Pu 239	1E-05	CC 2	1E-05	CC 2
Sn 126		8		8	Pu 240	2E-05	CC 2	2E-05	CC 2
Sb 125		8		8	Pu 241	7.37E-04	CC 2	1.91E-03	CC 2
Sb 126		8		8	Pu 242		8		8
Te 125m		8		8	Am 241	1.09E-04	CC 2	9.3E-05	CC 2
Te 127m		8		8	Am 242m		8		8
I 129		8		8	Am 243		8		8
Cs 134	3.24E-04	CC 2	6.43E-03	CC 2	Cm 242	3.23E-09	CC 2	1.69E-06	CC 2
Cs 135		8		8	Cm 243	1.64E-09	CC 2	1.95E-09	CC 2
Cs 137	1.64E-02	CC 2	1.95E-02	CC 2	Cm 244	7.95E-07	CC 2	1.92E-06	CC 2
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		8		8	Cf 249		8		8
Pm 145		8		8	Cf 250		8		8
Pm 147	4.04E-06	CC 2	5.37E-05	CC 2	Cf 251		8		8
Sm 147		8		8	Cf 252		8		8
Sm 151	7.56E-06	CC 2	8.93E-06	CC 2	Other a				
Eu 152		8		8	Other b/g	2.82E-09	CC 2	3.67E-06	CC 2
Eu 154	5.26E-06	CC 2	1.85E-05	CC 2	Total a	1.59E-04	CC 2	1.47E-04	CC 2
Eu 155		8		8	Total b/g	1.95E-02	CC 2	3.23E-02	CC 2

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