

WASTE STREAM**9C53****Miscellaneous Contaminated Items**

SITE Dungeness A
SITE OWNER Nuclear Decommissioning Authority
WASTE CUSTODIAN Magnox Limited
WASTE TYPE ILW

WASTE VOLUMES

		Reported
Stocks:	At 1.4.2019.....	2.7 m ³
Total future arisings:		0 m ³
Total waste volume:		2.7 m ³

Comment on volumes: The quoted volumes do not take into account any volume reduction by supercompaction. The Station ceased generation on 31/12/2006.

Uncertainty factors on volumes: Stock (upper): x 1.2 Arisings (upper) x
 Stock (lower): x 0.8 Arisings (lower) x

WASTE SOURCE Waste originating from reactor pilecap and associated areas and from reactor outages.

PHYSICAL CHARACTERISTICS

General description: Plastic, rubble, wood, glass, steel and drums containing the waste. The waste will include any large plant items that need to be replaced.

Physical components (%vol): Scrapped plant items, protective sheeting, decontamination materials, filters and drums containing the waste.

Sealed sources: -

Bulk density (t/m³): 0.5

Comment on density: Density based on typical weight of 200 litre drum.

CHEMICAL COMPOSITION

General description and components (%wt): The waste consists of plastic, rubble, wood, glass and steel in the form of scrapped plant, protective sheeting, decontamination materials and filters. The filters may contain a quantity of aluminium. Metal (~8% wt), plastic (~30% wt), wood (~8% wt), glass/rubble (~12% wt), drums (~22% wt) and others (~20% wt - including about 1% wt asbestos and some rubber).

Chemical state: Neutral

Chemical form of radionuclides: H-3: The chemical form of tritium has not been determined.
 C-14: The chemical form of carbon-14 has not been determined but may be graphite.
 Cl-36: The chemical form of chlorine 36 has not been determined but may be chloride.
 U: The chemical form of uranium has not been determined but may be uranium oxides.
 Pu: The chemical form of plutonium has not been determined but may be plutonium oxides.

Metals and alloys (%wt): Metal thickness may vary from ~1 mm to ~30 mm.

Stainless steel.....	~8.0	Nickel and chromium present as constituents of stainless steel.
Other ferrous metals.....	~22.0	
Iron.....		
Aluminium.....	<1.0	
Beryllium.....	TR	
Cobalt.....		
Copper.....	TR	
Lead.....	TR	
Magnox/Magnesium.....	TR	
Nickel.....		
Titanium.....		
Uranium.....		

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Zinc..... TR

Zircaloy/Zirconium..... TR

Other metals..... NE

No "other" metals have been identified.

Organics (%wt):

The waste contains cellulose in the form of wood (~8% wt) and plastics (~30% wt). The waste may contain halogenated rubber as neoprene, and contain halogenated plastics as PVC.

Total cellulosics..... ~8.0

 Paper, cotton..... 0

 Wood..... ~8.0

Halogenated plastics ~30.0

PVC

Total non-halogenated plastics..... NE

 Condensation polymers..... NE

 Others..... NE

Organic ion exchange materials.... 0

Total rubber..... <19.0

 Halogenated rubber <9.5

Neoprene

 Non-halogenated rubber..... <9.5

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. NE

Inorganic sludges and flocs..... NE

Soil..... ~3.0

Brick/Stone/Rubble..... ~3.0

Cementitious material.....

Sand..... ~3.0

Glass/Ceramics..... ~3.0

Graphite..... NE

Desiccants/Catalysts.....

Asbestos..... ~1.0

 Non/low friable.....

 Moderately friable.....

 Highly friable.....

Free aqueous liquids..... 0

Free non-aqueous liquids..... 0

Powder/Ash..... 0

Inorganic anions (%wt):

May be present in trace quantities.

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Fluoride.....	TR
Chloride.....	TR
Iodide.....	TR
Cyanide.....	0
Carbonate.....	TR
Nitrate.....	TR
Nitrite.....	TR
Phosphate.....	TR
Sulphate.....	TR
Sulphide.....	TR

Materials of interest for
waste acceptance criteria:

Asbestos may be present.

Combustible metals.....	0
Low flash point liquids.....	0
Explosive materials.....	0
Phosphorus.....	0
Hydrides.....	0
Biological etc. materials.....	0
Biodegradable materials.....	
Putrescible wastes.....	0
Non-putrescible wastes.....	
Corrosive materials.....	0
Pyrophoric materials.....	0
Generating toxic gases.....	0
Reacting with water.....	0
Active particles.....	
Soluble solids as bulk chemical compounds.....	

Hazardous substances /
non hazardous pollutants:

Asbestos at ~1% wt may be present.

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

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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: Dungeness A Site
 Plant startup date: -
 Total capacity (m³/y incoming waste): -
 Target start date for packaging this stream: -
 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
	500 l RS drum (0mm Pb)	100.0	0.45	0.49	6

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Likely container type comment: -

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: Contaminated and activated waste from the reactors and associated plant.

Uncertainty: Specific activity is a function of Station operating history.

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: There have been no measurements of activity for this stream but the radionuclides expected to be present have been indicated in the table.

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		6			Gd 153		8		
Be 10		8			Ho 163		8		
C 14		6			Ho 166m		8		
Na 22		8			Tm 170		8		
Al 26		8			Tm 171		8		
Cl 36		6			Lu 174		8		
Ar 39		8			Lu 176		8		
Ar 42		8			Hf 178n		8		
K 40		8			Hf 182		8		
Ca 41		8			Pt 193		8		
Mn 53		8			Tl 204		8		
Mn 54		6			Pb 205		8		
Fe 55		6			Pb 210		8		
Co 60		6			Bi 208		8		
Ni 59		8			Bi 210m		8		
Ni 63		6			Po 210		8		
Zn 65		6			Ra 223		8		
Se 79		8			Ra 225		8		
Kr 81		8			Ra 226		8		
Kr 85		8			Ra 228		8		
Rb 87		8			Ac 227		8		
Sr 90		6			Th 227		8		
Zr 93		8			Th 228		8		
Nb 91		8			Th 229		8		
Nb 92		8			Th 230		8		
Nb 93m		8			Th 232		8		
Nb 94		8			Th 234		8		
Mo 93		8			Pa 231		8		
Tc 97		8			Pa 233		8		
Tc 99		8			U 232		8		
Ru 106		6			U 233		8		
Pd 107		8			U 234		6		
Ag 108m		6			U 235		6		
Ag 110m		6			U 236		8		
Cd 109		8			U 238		6		
Cd 113m		8			Np 237		8		
Sn 119m		8			Pu 236		8		
Sn 121m		8			Pu 238		6		
Sn 123		8			Pu 239		6		
Sn 126		8			Pu 240		6		
Sb 125		6			Pu 241		6		
Sb 126		8			Pu 242		8		
Te 125m		8			Am 241		6		
Te 127m		8			Am 242m		8		
I 129		8			Am 243		8		
Cs 134		6			Cm 242		6		
Cs 135		8			Cm 243		6		
Cs 137		6			Cm 244		6		
Ba 133		6			Cm 245		8		
La 137		8			Cm 246		8		
La 138		8			Cm 248		8		
Ce 144		6			Cf 249		8		
Pm 145		8			Cf 250		8		
Pm 147		6			Cf 251		8		
Sm 147		8			Cf 252		8		
Sm 151		8			Other a				
Eu 152		6			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