

**WASTE STREAM****3S101****Decommissioning: Station Maintenance LLW****SITE** Sizewell B**SITE OWNER** EDFE NGL**WASTE CUSTODIAN** EDFE NGL**WASTE TYPE** LLW**WASTE VOLUMES**

		Reported
Stocks:	At 1.4.2019.....	0 m <sup>3</sup>
Future arisings -	1.4.2019 - 31.3.2035.....	0 m <sup>3</sup>
	1.4.2035 - 31.3.2036.....	46.1 m <sup>3</sup>
	1.4.2036 - 31.3.2037.....	61.6 m <sup>3</sup>
	1.4.2037 - 31.3.2038.....	61.4 m <sup>3</sup>
	1.4.2038 - 31.3.2039.....	61.4 m <sup>3</sup>
	1.4.2039 - 31.3.2040.....	45.6 m <sup>3</sup>
	1.4.2040 - 31.3.2042.....	0 m <sup>3</sup>
	1.4.2042 - 31.3.2043.....	253.4 m <sup>3</sup>
	1.4.2043 - 31.3.2051.....	0 m <sup>3</sup>
	1.4.2051 - 31.3.2052.....	15.1 m <sup>3</sup>
Total future arisings:		544.5 m <sup>3</sup>
Total waste volume:		544.5 m <sup>3</sup>

Comment on volumes: Waste volumes will be variable depending on station operating conditions.

Uncertainty factors on volumes: Stock (upper): x Arisings (upper) x 1.75  
 Stock (lower): x Arisings (lower) x 0.25

**WASTE SOURCE** Hard and soft trash arising from maintenance.**PHYSICAL CHARACTERISTICS**

General description: The materials may include slightly contaminated plastics, paper, rubber, wood, glass, metals and clothing. There may also be filters and redundant equipment. No large items that may require special handling are expected to arise routinely.

Physical components (%wt): Metal (2%wt), soil/rubble (1%wt), soft organics (11%wt), plastic/rubber (85%wt), wood (1%wt).

Sealed sources: The waste does not contain sealed sources.

Bulk density (t/m<sup>3</sup>): 0.75

Comment on density: The density is likely to lie between 0.5 and 1 t/m<sup>3</sup>.

**CHEMICAL COMPOSITION**

General description and components (%wt): Metal (2%wt), soil/rubble (1%wt), soft organics (11%wt), plastic/rubber (85%wt), wood (1%wt).

Chemical state: Neutral

Chemical form of radionuclides: -

Metals and alloys (%wt): -

Stainless steel.....	~1.0	
Other ferrous metals.....	~1.0	Misc. items and drums
Iron.....	NE	
Aluminium.....	NE	
Beryllium.....	NE	
Cobalt.....	NE	
Copper.....	NE	
Lead.....	NE	
Magnox/Magnesium.....	NE	

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	Nickel.....	NE
	Titanium.....	NE
	Uranium.....	NE
	Zinc.....	NE
	Zircaloy/Zirconium.....	NE
	Other metals.....	NE
Organics (%wt):	Cellulosic includes paper and cotton. Other organics includes ash. PVC, neoprene and latex amongst others.	
	Total cellulosics.....	~12.0
	Paper, cotton.....	~11.0
	Wood.....	~1.0
	Halogenated plastics .....	~20.0
	Total non-halogenated plastics.....	~60.0
	Condensation polymers.....	~0
	Others.....	~60.0
	Organic ion exchange materials....	~0
	Total rubber.....	~5.0
	Halogenated rubber .....	~3.0
	Non-halogenated rubber.....	~2.0
	Hydrocarbons.....	NE
	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.	0
	Inorganic sludges and flocs.....	0
	Soil.....	0
	Brick/Stone/Rubble.....	~1.0
	Cementitious material.....	0
	Sand.....	0
	Glass/Ceramics.....	NE
	Graphite.....	0
	Desiccants/Catalysts.....	NE
	Asbestos.....	NE
	Non/low friable.....	
	Moderately friable.....	
	Highly friable.....	
	Free aqueous liquids.....	0
	Free non-aqueous liquids.....	0

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	Powder/Ash.....	0	
Inorganic anions (%wt):	Only trace quantities, if any, will be present.		
	Fluoride.....	TR	
	Chloride.....	TR	
	Iodide.....	TR	
	Cyanide.....	0	
	Carbonate.....	TR	
	Nitrate.....	TR	
	Nitrite.....	NE	
	Phosphate.....	TR	
	Sulphate.....	TR	
	Sulphide.....	TR	
Materials of interest for waste acceptance criteria:	Some of the materials would burn under appropriate conditions. The waste might include very small quantities of asbestos occasionally.		
	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.....		
	Corrosive materials.....	0	
	Pyrophoric materials.....	0	
	Generating toxic gases.....	0	
	Reacting with water.....	0	
	Active particles.....	0	Not expected.
	Soluble solids as bulk chemical compounds.....	0	
Hazardous substances / non hazardous pollutants:	None expected.		
	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	

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Barium.....	NE
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.....	NE
EEE Type 2.....	NE
EEE Type 3.....	NE
EEE Type 4.....	NE
EEE Type 5.....	NE

Complexing agents (%wt):

Not yet determined	
EDTA.....	NE
DPTA.....	NE
NTA.....	NE
Polycarboxylic acids.....	NE
Other organic complexants.....	NE
Total complexing agents.....	NE

Not expected.

**TREATMENT, PACKAGING AND DISPOSAL**

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

Treatment	On-site / Off site	Stream volume %
Low force compaction		
Supercompaction (HFC)	Off-site	~10.0
Incineration	Off-site	~70.0
Solidification	On-site	<5.0
Decontamination		
Metal treatment	Off-site	~10.0
Size reduction		
Decay storage		
Recycling / reuse		
Other / various		
None		~5.0

Comment on planned treatments:

Material breakdown is not fully underpinned but future arisings are expected to be similar to routine operational low level waste arisings. In line with the waste hierarchy, wastes will be treated preferentially by incineration, metal decontamination/melting, supercompaction, optimal packaging in HHISOs or immobilisation by encapsulation where necessary, prior to ultimate disposal at the LLW Repository. These treatments will be carried out off-site under contract with companies such as LLWR Ltd, EDF Cyclife, Tradebe and Inutec. The percentages are based on the history of consignments across the fleet of EDF Energy Nuclear Generation stations.

**WASTE STREAM****3S101****Decommissioning: Station Maintenance LLW****Disposal Routes:**

Disposal Route	Stream volume %
Expected to be consigned to the LLW Repository	15.0
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	70.0
Expected to be consigned to a Metal Treatment Facility	10.0
Expected to be consigned as Out of Scope	
Expected to be recycled / reused	5.0
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	20.0	~13.42	9
2m box (no shielding)			
4m box (no shielding)			
Other			

**Other information:**

Waste loading is representative of the raw waste following further planned treatments. The residual LLW from incineration and metal decontamination is assumed to be captured within the data provided by LLWR in waste stream 6H02 - LLW (Minor Users).

**Waste Planned for Disposal at the LLW Repository:**

Container voidage: -

Waste Characterisation Form (WCH):

The waste meets the LLWR's Waste Acceptance Criteria (WAC).  
The waste does not have a current WCH.

Waste consigned for disposal to LLWR in year of generation:

Yes.

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: -

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Other information:

-

**RADIOACTIVITY**

Source:

The main sources of activity in the waste will be variable.

Uncertainty:

The activity values quoted are indicative of the activities that may be expected. The activity estimates are thought to be accurate to within a factor of 10.

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:

Theoretical assessment.

Other information:

Specific activity is a function of station operating history. The values quoted are indicative of the activities that might be expected. "Other" beta/gamma activities expected to be present are (in TBq/m<sup>3</sup>):- Co57 (2E-8) and Co58 (1E-08)."

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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			1E-04	CC 2	Gd 153				
Be 10				8	Ho 163				
C 14			3E-05	CC 2	Ho 166m				
Na 22				4	Tm 170				
Al 26				4	Tm 171				
Cl 36			1E-09	CC 2	Lu 174				
Ar 39					Lu 176				
Ar 42					Hf 178n				
K 40					Hf 182				
Ca 41				8	Pt 193				
Mn 53					Tl 204				
Mn 54			1E-06	CC 2	Pb 205				
Fe 55			5E-06	CC 2	Pb 210				8
Co 60			7E-06	CC 2	Bi 208				
Ni 59				8	Bi 210m				
Ni 63			8E-08	CC 2	Po 210				8
Zn 65			4E-08	CC 2	Ra 223				
Se 79				8	Ra 225				
Kr 81					Ra 226				8
Kr 85					Ra 228				
Rb 87					Ac 227				
Sr 90			3E-07	CC 2	Th 227				
Zr 93				8	Th 228				
Nb 91					Th 229				8
Nb 92					Th 230				8
Nb 93m				8	Th 232				8
Nb 94				8	Th 234				
Mo 93				8	Pa 231				8
Tc 97					Pa 233				
Tc 99				8	U 232				
Ru 106			8E-07	CC 2	U 233				8
Pd 107				8	U 234				8
Ag 108m				8	U 235				8
Ag 110m			2E-08	CC 2	U 236				8
Cd 109					U 238				8
Cd 113m					Np 237				8
Sn 119m					Pu 236				
Sn 121m				8	Pu 238		2E-09	CC 2	
Sn 123					Pu 239				8
Sn 126				8	Pu 240				8
Sb 125			7E-07	CC 2	Pu 241		2E-07	CC 2	
Sb 126					Pu 242				8
Te 125m					Am 241				8
Te 127m			2E-09	CC 2	Am 242m				8
I 129				8	Am 243				8
Cs 134			2E-06	CC 2	Cm 242				8
Cs 135				8	Cm 243				8
Cs 137			6E-06	CC 2	Cm 244				8
Ba 133					Cm 245				8
La 137					Cm 246				8
La 138					Cm 248				
Ce 144			4E-07	CC 2	Cf 249				
Pm 145					Cf 250				
Pm 147				8	Cf 251				
Sm 147					Cf 252				
Sm 151				8	Other a				8
Eu 152				8	Other b/g		3E-08	CC 2	
Eu 154				8	<b>Total a</b>	<b>0</b>	<b>2E-09</b>	<b>CC 2</b>	
Eu 155				8	<b>Total b/g</b>	<b>0</b>	<b>1.54E-04</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