

WASTE STREAM**3J03****Miscellaneous Contaminated Items****SITE** Dungeness B**SITE OWNER** EDFE NGL**WASTE CUSTODIAN** EDFE NGL**WASTE TYPE** ILW; SPD1

Is the waste subject to Scottish Policy: No

WASTE VOLUMES

Reported

Stocks: At 1.4.2022..... 0 m³Future arisings - 1.4.2022 - 31.3.2028..... 4.0 m³Total future arisings: 4.0 m³Total waste volume: 4.0 m³

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

| | | | | |
|---------------------------------|----------------|---|------------------|-------|
| Uncertainty factors on volumes: | Stock (upper): | x | Arisings (upper) | x 1.5 |
| | Stock (lower): | x | Arisings (lower) | x 0.5 |

WASTE SOURCE Redundant contaminated plant items and other materials contaminated beyond the limits for LLW.**PHYSICAL CHARACTERISTICS**

General description: Expected to be primarily metal items. Other items such as HEPA filters and bags of vacuum cleaner waste may also be present.

Physical components (%vol): No stock currently present therefore breakdown is not assessed.

Sealed sources: The waste does not contain sealed sources.

Bulk density (t/m³): ~1.5Comment on density: As cut for packaging. Density is expected to lie between 1t/m³ and 2t/m³**CHEMICAL COMPOSITION**

General description and components (%wt): The waste is expected to be principally steel but may include other components. Organic material may be present in small quantities e.g. traces of oil. Fission products, actinides and other activation products will be present as contaminants.

Chemical state: Neutral

Chemical form of radionuclides:

H-3: Diffused into materials
 C-14: Graphite
 Cl-36: Not Assessed
 Se-79: Not Assessed
 Tc-99: Not Assessed
 I-129: Not expected to be significant
 Ra: Not expected to be significant
 Th: Not expected to be significant
 U: Not Assessed
 Np: Not Assessed
 Pu: Not Assessed

Metals and alloys (%wt): -

| | (%wt) | Type(s) / Grade(s) with proportions | % of total C14 activity |
|---------------------------|-------|-------------------------------------|-------------------------|
| Stainless steel..... | ~50.0 | | |
| Other ferrous metals..... | ~50.0 | | |
| Iron..... | | | |
| Aluminium..... | NE | | |
| Beryllium..... | NE | | |
| Cobalt..... | NE | | |
| Copper..... | NE | | |

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Miscellaneous Contaminated Items

| | |
|-------------------------|----|
| Lead..... | NE |
| Magnox/Magnesium..... | 0 |
| Nickel..... | NE |
| Titanium..... | NE |
| Uranium..... | NE |
| Zinc..... | NE |
| Zircaloy/Zirconium..... | 0 |
| Other metals..... | NE |

Organics (%wt): There may be traces of oil. Note that items may be wrapped in polythene.

| | (%wt) | Type(s) and comment | % of total C14 activity |
|-------------------------------------|-------|---------------------|-------------------------|
| 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..... | TR | | |

Other materials (%wt): -

| | (%wt) | Type(s) and comment | % of total C14 activity |
|------------------------------------|-------|---------------------|-------------------------|
| Inorganic ion exchange materials.. | 0 | | |
| Inorganic sludges and flocs..... | 0 | | |
| Soil..... | 0 | | |
| Brick/Stone/Rubble..... | 0 | | |
| Cementitious material..... | 0 | | |
| Sand..... | 0 | | |
| Glass/Ceramics..... | | | |
| Graphite..... | 0 | | |
| Desiccants/Catalysts..... | 0 | | |
| Asbestos..... | 0 | | |

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| | |
|-------------------------------|---|
| Non/low friable..... | |
| Moderately friable..... | |
| Highly friable..... | |
| Free aqueous liquids..... | 0 |
| Free non-aqueous liquids..... | 0 |
| Powder/Ash..... | 0 |

Inorganic anions (%wt): None of the listed inorganic anions are expected to be present at greater than 1%.

| | (%wt) | Type(s) and comment |
|----------------|-------|---------------------|
| Fluoride..... | <1.0 | |
| Chloride..... | <1.0 | |
| Iodide..... | <1.0 | |
| Cyanide..... | NE | |
| Carbonate..... | <1.0 | |
| Nitrate..... | <1.0 | |
| Nitrite..... | NE | |
| Phosphate..... | <1.0 | |
| Sulphate..... | <1.0 | |
| Sulphide..... | <1.0 | |

Materials of interest for waste acceptance criteria: Materials likely to present a fire hazard or non-radioactive hazard are not anticipated.

| | (%wt) | Type(s) and comment |
|--|-------|---------------------|
| 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..... | 0 | |
| Corrosive materials..... | 0 | |
| Pyrophoric materials..... | 0 | |
| Generating toxic gases..... | 0 | |
| Reacting with water..... | 0 | |
| Higher activity particles..... | P | May be present |
| Soluble solids as bulk chemical compounds..... | 0 | |

Hazardous substances / non hazardous pollutants: -

| | (%wt) | Type(s) and comment |
|-----------------|-------|---------------------|
| Acrylamide..... | | |
| Benzene..... | NE | |

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| | |
|---------------------------------------|----|
| Chlorinated solvents..... | |
| Formaldehyde..... | |
| Organometallics..... | |
| Phenol..... | NE |
| Styrene..... | |
| Tri-butyl phosphate..... | NE |
| Other organophosphates..... | |
| Vinyl chloride..... | NE |
| Arsenic..... | NE |
| Barium..... | |
| Boron..... | NE |
| Boron (in Boral)..... | NE |
| Boron (non-Boral)..... | NE |
| 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): Not yet determined

| | (%wt) | Type(s) and comment |
|--------------------------------|-------|-------------------------------------|
| EDTA..... | | |
| DPTA..... | | |
| NTA..... | | |
| Polycarboxylic acids..... | NE | |
| Other organic complexants..... | NE | May be present in trace quantities. |
| Total complexing agents..... | NE | |

Potential for the waste to contain discrete items: Not yet determined.

PACKAGING AND CONDITIONING

Conditioning method: The waste is expected to be encapsulated without being supercompacted. Decontamination and cutting to reduce volumes may be appropriate for some wastes.

WASTE STREAM**3J03****Miscellaneous Contaminated Items**

Plant Name: None.
 Location: Dungeness B Power Station.
 Plant startup date: Between 2028 and 2033.
 Total capacity (m³/y incoming waste): ~500.0
 Target start date for packaging this stream: -
 Throughput for this stream (m³/y incoming waste): ~
 Other information: All the waste will be retrieved when a conditioning campaign is undertaken. There may be more than one campaign.

| Likely container type: | Container | Waste packaged (%vol) | Waste loading (m ³) | Payload (m ³) | Number of packages |
|------------------------|------------|-----------------------|---------------------------------|---------------------------|--------------------|
| | 500 l drum | 100.0 | ~0.24 | 0.47 | 17 |

Likely container type comment: -
 Range in container waste volume: -
 Other information on containers: Waste will be packaged in 500L drums with a conditioning factor of ~2.0
 Likely conditioning matrix: BFS/OPC
 Other information: PFA/OPC is another matrix that may be adopted.
 Conditioned density (t/m³): ~3.0
 Conditioned density comment: Expected to be between 2 and 4 t/m³. The maximum density of the conditioned waste will be less than 7.5 t/m³.
 Other information on conditioning: Appropriate plant will be provided at the Station in accordance with EDF Energy strategy. Decontamination followed by cutting to reduce volumes may be appropriate for some wastes.
 Opportunities for alternative disposal routing: No

| Baseline Management Route | Opportunity Management Route | Stream volume (%) | Estimated Date that Opportunity will be realised | Opportunity Confidence | Comment |
|---------------------------|------------------------------|-------------------|--|------------------------|---------|
| - | - | - | - | - | - |

RADIOACTIVITY

Source: Redundant contaminated plant items and materials, contaminated beyond the limits for LLW.
 Uncertainty: 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: -
 Other information: Estimates have been based on theoretical assessments. Other beta/gamma nuclides of arisings and stocks (in TBq/m³) include S35 (2E-2, 1E-16); Ca45 (8E-4, 9E-12); Cr51 (1E-3, 0); Co58 (2E-4, 0); Sr89 (6E-9, 0); Y91 (5E-8, 0); Zr95 (2E-4, 0); Nb95 (1E-4, 0); Ru103 (3E-4, 0); Ta182 (7E-3, 7E-14); Sc46 (2E-5, <1E-17); Fe59 (4E-5, <2E-24); Se75 (6E-4, 2E-14) and Sb124 (2E-5, <1E-20).

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Miscellaneous Contaminated Items

| Nuclide | Mean radioactivity, TBq/m ³ | | | | Nuclide | Mean radioactivity, TBq/m ³ | | | |
|---------|--|----------------|-----------------|----------------|------------------|--|-----------------|-----------------|----------------|
| | Waste at 1.4.2022 | Bands and Code | Future arisings | Bands and Code | | Waste at 1.4.2022 | Bands and Code | Future arisings | Bands and Code |
| H 3 | | | 9E-03 | CC 2 | Gd 153 | | | | |
| Be 10 | | | | 8 | Ho 163 | | | | |
| C 14 | | | 6E-04 | CC 2 | Ho 166m | | | | |
| Na 22 | | | | 4 | Tm 170 | | | | |
| Al 26 | | | | 4 | Tm 171 | | | | |
| Cl 36 | | | 7E-03 | 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 | | | 3E-03 | CC 2 | Pb 205 | | | | |
| Fe 55 | | | 4E-02 | CC 2 | Pb 210 | | | | 8 |
| Co 60 | | | 1E-02 | CC 2 | Bi 208 | | | | |
| Ni 59 | | | <1E-04 | C 3 | Bi 210m | | | | |
| Ni 63 | | | 3E-03 | CC 2 | Po 210 | | | | 8 |
| Zn 65 | | | 3E-04 | CC 2 | Ra 223 | | | | |
| Se 79 | | | 6.9E-10 | CC 2 | Ra 225 | | | | |
| Kr 81 | | | | | Ra 226 | | | | 8 |
| Kr 85 | | | | | Ra 228 | | | | |
| Rb 87 | | | | | Ac 227 | | | | |
| Sr 90 | | | 4E-04 | CC 2 | Th 227 | | | | |
| Zr 93 | | | 3E-08 | CC 2 | Th 228 | | | | |
| Nb 91 | | | | | Th 229 | | | | 8 |
| Nb 92 | | | | | Th 230 | | | | 8 |
| Nb 93m | | | 3E-09 | CC 2 | Th 232 | | | | 8 |
| Nb 94 | | | <4E-06 | C 3 | Th 234 | | | | |
| Mo 93 | | | | 8 | Pa 231 | | | | 8 |
| Tc 97 | | | | | Pa 233 | | | | |
| Tc 99 | | | 1E-07 | CC 2 | U 232 | | | | |
| Ru 106 | | | 1E-03 | CC 2 | U 233 | | | | 8 |
| Pd 107 | | | | 8 | U 234 | | 6E-08 | CC 2 | |
| Ag 108m | | | <8E-06 | C 3 | U 235 | | 1E-09 | CC 2 | |
| Ag 110m | | | 2E-04 | CC 2 | U 236 | | 1E-08 | CC 2 | |
| Cd 109 | | | | | U 238 | | 2E-08 | CC 2 | |
| Cd 113m | | | | | Np 237 | | 9E-09 | CC 2 | |
| Sn 119m | | | | | Pu 236 | | | | |
| Sn 121m | | | | 8 | Pu 238 | | 4E-06 | CC 2 | |
| Sn 123 | | | | | Pu 239 | | 5E-06 | CC 2 | |
| Sn 126 | | | 2.61E-09 | CC 2 | Pu 240 | | 8E-06 | CC 2 | |
| Sb 125 | | | 6E-06 | CC 2 | Pu 241 | | 4E-04 | CC 2 | |
| Sb 126 | | | | | Pu 242 | | <5E-08 | C 3 | |
| Te 125m | | | | | Am 241 | | 2E-05 | CC 2 | |
| Te 127m | | | | | Am 242m | | 3E-07 | CC 2 | |
| I 129 | | | | 8 | Am 243 | | 2E-07 | CC 2 | |
| Cs 134 | | | 6E-04 | CC 2 | Cm 242 | | 1E-06 | CC 2 | |
| Cs 135 | | | 5E-09 | CC 2 | Cm 243 | | 2E-08 | CC 2 | |
| Cs 137 | | | 1E-03 | CC 2 | Cm 244 | | 9E-07 | CC 2 | |
| Ba 133 | | | 2E-05 | CC 2 | Cm 245 | | | | 8 |
| La 137 | | | | | Cm 246 | | | | 8 |
| La 138 | | | | | Cm 248 | | | | |
| Ce 144 | | | 9E-07 | CC 2 | Cf 249 | | | | |
| Pm 145 | | | | | Cf 250 | | | | |
| Pm 147 | | | <8E-04 | C 3 | Cf 251 | | | | |
| Sm 147 | | | | | Cf 252 | | | | |
| Sm 151 | | | <1E-06 | C 3 | Other a | | | | 8 |
| Eu 152 | | | 2E-06 | CC 2 | Other b/g | | 3E-02 | CC 2 | |
| Eu 154 | | | 4E-06 | CC 2 | Total a | 0 | 3.93E-05 | CC 2 | |
| Eu 155 | | | 7E-06 | CC 2 | Total b/g | 0 | 1.07E-01 | 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