

WASTE STREAM	4C19	Pond Water Filtration Sludge
--------------	------	------------------------------

SITE Torness

SITE OWNER EDF Energy Nuclear Generation Ltd (EDFE NGL)

WASTE CUSTODIAN EDF Energy Nuclear Generation Ltd (EDFE NGL)

WASTE TYPE ILW

WASTE VOLUMES

	Reported (m ³)	OR	Conditioned (m ³)	Packaged (m ³)
Stocks:	At 1.4.2025	= 2.6		
Future arisings:	1.4.2025 - 31.3.2028	= 0.3		
	1.4.2028 - 31.3.2030	= 0.2		
Total future arisings:		0.5		
Total waste volume:		3.1		

Number of waste packages in stock: At 1.4.2025..... - packages

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

Additional information on quantities: -

Uncertainty factors on volumes: Stock (upper): x 1.25 Arisings (upper): x 1.50
Stock (lower): x 0.75 Arisings (lower): x 0.50

WASTE SOURCE Sludge and filter pre-coat material.

PHYSICAL CHARACTERISTICS

General description: Sludge and any filter precoat material. There are no large items that may require special handling.

Changes since waste generated: -

Bulk density (t/m³): ~ 1.0

Comment on density: -

CHEMICAL COMPOSITION

General description and components (%wt): Predominantly Filter precoat which is essentially mineral silica (silicon dioxide). There will also be debris filtered from pond water. Other materials not assessed.

Chemical state: Neutral

Sheet metal proportion / thickness: -

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	NE	-	
Other ferrous metals.....	NE	-	
Iron.....	NE	-	
Aluminium.....	NE	-	
Beryllium.....	NE	-	
Cobalt.....	NE	-	
Copper.....	NE	-	
Lead.....	NE	-	
Magnox/Magnesium.....	NE	-	
Nickel.....	NE	-	
Titanium.....	NE	-	
Uranium.....	NE	-	
Zinc.....	NE	-	
Zircaloy/Zirconium.....	NE	-	
Other metals.....	NE	-	

Organics (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
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.....	= 0	-	
Oil or grease.....	-	-	
Fuel.....	-	-	
Asphalt/Tarmac (cont.coal tar).....	-	-	
Asphalt/Tarmac (no coal tar).....	-	-	
Bitumen.....	-	-	
Others.....	-	-	
Other organics.....	NE	-	

Other materials (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Inorganic ion exchange materials.....	= 0	-	
Inorganic sludges and flocs.....	= 100.0	-	
Soil.....	= 0	-	
Brick/Stone/Rubble.....	= 0	-	
Cementitious material.....	= 0	-	
Sand.....	= 0	-	
Glass/Ceramics.....	-	-	
Graphite.....	= 0	-	
Desiccants/Catalysts.....	= 0	-	
Asbestos.....	= 0	-	
Non/low friable.....	-	-	
Moderately friable.....	-	-	
Highly friable.....	-	-	
Free aqueous liquids.....	P	-	
Free non-aqueous liquids.....	P	-	
Powder/Ash.....	= 0	-	

COMPONENTS OF MATERIALS, WASTE PROPERTIES, MATERIALS NOT CONTRIBUTING TO MASS

Inorganic anions (%wt):

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

Materials of interest for waste acceptance criteria:

	(%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.....	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	-
Barium.....	NE	-
Boron.....	NE	-
Boron (in Boral).....		-
Boron (non-Boral).....		-
Cadmium.....	NE	-
Caesium.....	NE	-
Selenium.....	NE	-
Chromium.....	NE	-
Molybdenum.....	NE	-
Thallium.....	NE	-
Tin.....	NE	-
Vanadium.....	NE	-
Mercury compounds.....	NE	-
Others.....	NE	-

Complexing agents (%wt):

Not yet determined		
	(%wt)	Type(s) and comment
EDTA.....	NE	-
DPTA.....	NE	-
NTA.....	NE	-
Polycarboxylic acids.....	NE	-
Other organic complexants.....	NE	Expect only trace quantities, if any.
Total complexing agents.....	NE	-

Physical components:

	Number	Type(s) and comment
Sources.....	= 0	-
Electronic & Electrical Equipment (EEE)		-
EEE Type 1.....		-
EEE Type 2.....		-
EEE Type 3.....		-
EEE Type 4.....		-
EEE Type 5.....		-

TREATMENT, PACKAGING AND DISPOSAL

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

Treatment	On-site / Off-site	Stream volume %
Size reduction Decay storage Low force compaction Supercompaction (HFC) Incineration Drying/dewatering/liquid separation Tie down/fixatives/strippable coating/painting application Decontamination Metal treatment Recycling / reuse Thermal treatment, including vitrification Encapsulation Polymer encapsulation Other physical treatment Other chemical treatment Containerisation Treatment not yet determined None	On-site	~ 100.0

Comments on planned treatments:

-

Conditioning method:

-

Conditioning plants:

Plant Name	Location
Torness Operational Waste Processing Facility (OWPF)	Torness

Likely conditioning matrix:

-

Further information on the conditioning matrix:

A 9:1 BFS/OPC matrix to formula FS044A is expected.

Waste Packaging:

Likely container type:	Container	Waste packaged (vol%)	Waste loading (m³)	Payload (m³)	Number of packages	Estimated start date for packaging
	500 l drum	100.0	0.33	0.47	10	-

Range in container waste loading:

Other information on packaging and conditioning: -

Conditioned density (t/m³): ~ 1.8

Conditioned density comment: Density in the range 1.68 - 1.84 t/m³ is expected.

Management Routes:

Disposal Route	Stream volume %	Raw density t/m³	Start date
Expected to be consigned to a Near Site, Near Surface Disposal Facility (Scotland)	= 100.0		
Expected to be Non-NSD HAW managed under Scottish Government's policy			
Expected to be disposed to LLW Vaults NRS Dounreay			
Expected to be consigned to the Geological Disposal Facility			
Expected to be consigned to a Near Surface Disposal Facility			
Expected to be consigned to the LLW Repository			
Expected to be consigned to a Landfill Facility			
Expected to be disposed On-Site			
Expected to be managed by In-Situ Disposal			
Expected to be consigned to an Incineration Facility			
Expected to be consigned to a Metal Treatment Facility			
Expected to be Out of Scope			
Expected to be recycled / reused			
Disposal route not known			

Classification codes for waste expected to be consigned to a landfill facility:

Opportunities for alternative disposal routing: No

Baseline Management Route	Opportunity Management Route	Stream volume (%)	Opportunity Confidence	Comment
-	-	-	-	-

RADIOACTIVITY

Source: Contaminated filter precoat. Contamination by activation products will be the main source of activity.

Uncertainty: Requires further assessment.

Measurement of radioactivities: Not yet assessed.

Chemical form of radionuclides: H-3: Contamination by tritiated water
C-14: Contamination by activated graphite
Cl-36: To be determined
Se-79: To be determined
Tc-99: To be determined
I-129: To be determined
Ra: To be determined
Th: To be determined
U: To be determined
Np: To be determined
Pu: To be determined

WASTE STREAM 4C19 Pond Water Filtration Sludge									
Nuclide	Mean radioactivity, TBq/m³				Nuclide	Mean radioactivity, TBq/m³			
	Waste at 1.4.2025	Bands and Code	Future Arisings	Bands and Code		Waste at 1.4.2025	Bands and Code	Future Arisings	Bands and Code
H 3		6		6	Gd 153				
Be 10		8		8	Ho 163				
C 14		8		8	Ho 166m				
Na 22		4		4	Tm 170				
Al 26		4		4	Tm 171				
Cl 36		6		6	Lu 174				
Ar 39					Lu 176				
Ar 42					Hf 178n				
K 40					Hf 182				
Ca 41		8		8	Pt 193				
Mn 53					Ti 204				
Mn 54	6.33E-03	C C 2	1.06E-01	C C 2	Pb 205				
Fe 55	2.00E+00	C C 2	1.64E+01	C C 2	Pb 210		8		8
Co 60	2.52E-02	C C 2	9.50E-02	C C 2	Bi 208				
Ni 59		6		6	Bi 210m				
Ni 63		6		6	Po 210		8		8
Zn 65	1.00E-02	C C 2	1.95E-01	C C 2	Ra 223				
Se 79		6		6	Ra 225				
Kr 81					Ra 226		8		8
Kr 85					Ra 228				
Rb 87					Ac 227				
Sr 90		6		6	Th 227				
Zr 93		6		6	Th 228				
Nb 91					Th 229		8		8
Nb 92					Th 230		8		8
Nb 93m		8		8	Th 232		8		8
Nb 94		6		6	Th 234				
Mo 93		8		8	Pa 231		8		8
Tc 97					Pa 233				
Tc 99		6		6	U 232				
Ru 106	< 1.00E-02	C 3	< 1.48E-01	C 3	U 233		8		8
Pd 107		8		8	U 234		6		6
Ag 108m	< 2.00E-05	C 3	< 2.00E-05	C 3	U 235		6		6
Ag 110m	2.08E-04	C C 2	3.95E-03	C C 2	U 236		6		6
Cd 109					U 238		6		6
Cd 113m					Np 237		6		6
Sn 119m					Pu 236				
Sn 121m		8		8	Pu 238	2.00E-04	C C 2	2.24E-04	C C 2
Sn 123					Pu 239	2.00E-04	C C 2	2.00E-04	C C 2
Sn 126		6		6	Pu 240	4.00E-04	C C 2	4.00E-04	C C 2
Sb 125	< 9.00E-06	C 3	< 5.92E-05	C 3	Pu 241	4.00E-02	C C 2	7.40E-02	C C 2
Sb 126					Pu 242		6		6
Te 125m					Am 241	1.64E-03	C C 2	1.64E-03	C C 2
Te 127m					Am 242m		6		6
I 129		6		6	Am 243		6		6
Cs 134	2.20E-04	C C 2	1.89E-03	C C 2	Cm 242	1.00E-05	C C 2	2.36E-04	C C 2
Cs 135		6		6	Cm 243	1.00E-06	C C 2	1.38E-06	C C 2
Cs 137	4.79E-03	C C 2	6.56E-03	C C 2	Cm 244	4.00E-05	C C 2	6.60E-05	C C 2
Ba 133					Cm 245		8		8
La 137					Cm 246		8		8
La 138					Cm 248				
Ce 144	< 3.00E-03	C 3	< 5.30E-02	C 3	Cf 249				
Pm 145					Cf 250				
Pm 147		6		6	Cf 251				
Sm 147					Cf 252				
Sm 151		6		6	Unsp a	< 1.00E-09	8	< 1.00E-09	8
Eu 152	< 3.00E-05	C 3	< 5.73E-05	C 2	Unsp b/g	1.00E-03	C C 2	1.00E-03	C C 2
Eu 154	5.43E-04	C C 2	1.38E-03	C C 2	Total a	2.49E-03	*	2.77E-03	*
Eu 155	3.18E-04	C C 2	1.30E-03	C C 2	Total b/g	2.10E+00	*	1.71E+01	*

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 the 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
* Total calculated from the 114 declared radionuclides