WASTE STREAM 3J22 Miscellaneous Sludges

SITE	Dungeness B
SITE OWNER	EDFE NGL
WASTE CUSTODIAN	EDFE NGL
WASTE TYPE	LLW
Is the waste subject to Scottish Policy:	No

WASTE VOLUMES

		Reported
Stocks:	At 1.4.2022.....	0 m³
Future arisings -	1.4.2022 - 31.3.2028.....	~3.0 m³
Total future arisings:		3.0 m³
Total waste volume:		3.0 m³

Comment on volumes: Future arisings unpredictable.

Uncertainty factors on volumes:

Stock (upper):	x	Arisings (upper)	x 1.5
Stock (lower):	x	Arisings (lower)	x 0.5

WASTE SOURCE Waste arises from the treatment of active effluent. Occasionally sludge cannot be transferred to purpose built storage vessels and is removed from process/treatment vessels into drums, IBCs or similar containers for storage prior to characterisation and disposal.

PHYSICAL CHARACTERISTICS

General description:	Sludge recovered from active effluent treatment plant vessels.
Physical components (%vol):	Sludge (100% vol), no other items have been identified.
Sealed sources:	The waste does not contain sealed sources.
Bulk density (t/m³):	~2
Comment on density:	Waste density is an estimate.

CHEMICAL COMPOSITION

General description and components (%wt): A variety of materials.

Chemical state: Neutral

Chemical form of radionuclides:
H-3: Not assessed
C-14: Not assessed
Cl-36: Not assessed
Se-79: Not assessed
Tc-99: Not assessed
I-129: Not assessed
Ra: Not assessed
Th: Not assessed
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.....	NE		
Other ferrous metals.....	NE		
Iron.....	NE		
Aluminium.....	NE		
Beryllium.....	NE		
Cobalt.....	NE		

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Copper	NE
Lead	NE
Magnox/Magnesium	NE
Nickel	NE
Titanium	NE
Uranium	NE
Zinc	NE
Zircaloy/Zirconium	NE
Other metals	NE

Organics (%wt): Oil contaminated sludges present

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulosics	NE		
Paper, cotton			
Wood			
Halogenated plastics	NE		
Total non-halogenated plastics	NE		
Condensation polymers			
Others			
Organic ion exchange materials	NE		
Total rubber	NE		
Halogenated rubber			
Non-halogenated rubber			
Hydrocarbons	NE		
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	NE		
Inorganic sludges and flocs	100.0		
Soil	NE		
Brick/Stone/Rubble	NE		
Cementitious material	NE		
Sand	NE		
Glass/Ceramics	NE		
Graphite	NE		
Desiccants/Catalysts	NE		

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Asbestos	0
Non/low friable	
Moderately friable	
Highly friable	
Free aqueous liquids	P
Free non-aqueous liquids	NE
Powder/Ash	0

Inorganic anions (%wt): Inorganic anions may be present

	(%wt)	Type(s) and comment
Fluoride	NE	
Chloride	NE	
Iodide	NE	
Cyanide	0	
Carbonate	NE	
Nitrate	NE	
Nitrite	NE	
Phosphate	NE	
Sulphate	NE	
Sulphide	NE	

Materials of interest for waste acceptance criteria: Expect only trace quantities if any. Oil and grease may be present.

	(%wt)	Type(s) and comment
Combustible metals	0	
Low flash point liquids	0	
Explosive materials	0	
Phosphorus	0	
Hydrides	0	
Biological etc. materials	NE	
Biodegradable materials	NE	
Putrescible wastes		
Non-putrescible wastes		
Corrosive materials	0	
Pyrophoric materials	0	
Generating toxic gases	0	
Reacting with water	0	
Higher activity particles	0	Not expected
Soluble solids as bulk chemical compounds	0	

Hazardous substances / non hazardous pollutants: -

	(%wt)	Type(s) and comment
Acrylamide	NE	

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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)	NE
Boron (non-Boral)	NE
Cadmium	NE
Caesium	NE
Selenium	NE
Chromium	NE
Molybdenum	NE
Thallium	TR
Tin	NE
Vanadium	NE
Mercury compounds	NE
Others	NE
Electronic Electrical Equipment (EEE)	
EEE Type 1	0
EEE Type 2	0
EEE Type 3	0
EEE Type 4	0
EEE Type 5	0

Complexing agents (%wt): Not yet determined

	(%wt)	Type(s) and comment
EDTA	NE	
DPTA	NE	
NTA	NE	
Polycarboxylic acids	NE	
Other organic complexants	NE	
Total complexing agents	0	

Potential for the waste to contain discrete items: No.

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TREATMENT, PACKAGING AND DISPOSAL

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

Treatment	On-site / Off site	Stream volume %
Low force compaction		
Supercompaction (HFC)		
Incineration		
Solidification		
Decontamination		
Metal treatment		
Size reduction		
Decay storage		
Recyling / reuse		
Other / various	Off-site	100.0
None		

Comment on planned treatments: Preferred strategy not yet identified. In line with the waste hierarchy, waste will be preferentially treated by incineration, drying & supercompaction or cementation prior to disposal.

Disposal Routes:

Disposal Route	Stream volume %	Disposal density t/m3
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	100.0	

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

Upcoming (2022/23-2024/25) Waste Routing (if expected to change from above):

Disposal Route	Stream volume %		
	2022/23	2023/24	2024/25
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			

Opportunities for alternative disposal routing: -

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

Waste Packaging for Disposal: (Not applicable to this waste stream)

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Container	Stream volume %	Waste loading m³	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			
2m box (no shielding)			
4m box (no shielding)			
Other			

Other information: Disposal route to be confirmed.

Waste Planned for Disposal at the LLW Repository: (Not applicable to this waste stream)

Container voidage: -

Waste Characterisation Form (WCH): The waste does not meet the LLWR's Waste Acceptance Criteria (WAC).

Mobile wasteform, unsuitable for disposal to LLWR without further treatment.

Waste consigned for disposal to LLWR in year of generation: No. Awaiting characterisation prior to determination of BAT for disposal.

Non-Containerised Waste for In-Vault Grouting: (Not applicable to this waste stream)

Stream volume (%): -

Waste stream variation: -

Bounding cuboidal volume:

Inaccessible voidage: -

Other information: -

RADIOACTIVITY

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

Uncertainty: -

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: Nuclides likely to be present in significant quantities estimated from sludge waste stream 3J02.

Other information: -

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Nuclide	Mean radioactivity, TBq/m³				Nuclide	Mean radioactivity, TBq/m³			
	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				6	Gd 153				
Be 10					Ho 163				
C 14					Ho 166m				
Na 22				4	Tm 170				
Al 26				4	Tm 171				
Cl 36					Lu 174				
Ar 39					Lu 176				
Ar 42					Hf 178n				
K 40					Hf 182				
Ca 41					Pt 193				
Mn 53					Tl 204				
Mn 54				7	Pb 205				
Fe 55				7	Pb 210				
Co 60				7	Bi 208				
Ni 59				6	Bi 210m				
Ni 63				7	Po 210				
Zn 65				6	Ra 223				
Se 79					Ra 225				
Kr 81					Ra 226				
Kr 85					Ra 228				
Rb 87					Ac 227				
Sr 90				6	Th 227				
Zr 93					Th 228				
Nb 91					Th 229				
Nb 92					Th 230				
Nb 93m					Th 232				
Nb 94				6	Th 234				
Mo 93					Pa 231				
Tc 97					Pa 233				
Tc 99					U 232				
Ru 106				6	U 233				
Pd 107					U 234				
Ag 108m					U 235				
Ag 110m				6	U 236				
Cd 109					U 238				
Cd 113m					Np 237				
Sn 119m					Pu 236				
Sn 121m					Pu 238				6
Sn 123					Pu 239				6
Sn 126					Pu 240				6
Sb 125				6	Pu 241				6
Sb 126					Pu 242				
Te 125m					Am 241				6
Te 127m					Am 242m				6
I 129					Am 243				
Cs 134				6	Cm 242				6
Cs 135					Cm 243				
Cs 137				6	Cm 244				6
Ba 133					Cm 245				
La 137					Cm 246				
La 138					Cm 248				
Ce 144				6	Cf 249				
Pm 145					Cf 250				
Pm 147				6	Cf 251				
Sm 147					Cf 252				
Sm 151				6	Other a				6
Eu 152					Other b/g				7
Eu 154				6	**Total a**			**NE**	**7**
Eu 155				6	**Total b/g**			**NE**	**7**

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