

WASTE STREAM**9G71****Diversion Culvert Silt****SITE**

Trawsfynydd

SITE OWNER

Nuclear Decommissioning Authority

WASTE CUSTODIAN

Magnox Limited

WASTE TYPE

LLW

WASTE VOLUMES

		Reported
Stocks:	At 1.4.2019.....	53.0 m ³
Total future arisings:		0 m ³
Total waste volume:		53.0 m ³

Comment on volumes:

-

Uncertainty factors on volumes:

Stock (upper): x 1.2

Arisings (upper) x

Stock (lower): x 0.8

Arisings (lower) x

WASTE SOURCE

Contaminated sediment separated from waste stream 9G49 which now contains only oil.

PHYSICAL CHARACTERISTICS

General description:

-

Physical components (%wt):

Wet silty/loamy material

Sealed sources:

The waste does not contain sealed sources.

Bulk density (t/m³):

1.7

Comment on density:

-

CHEMICAL COMPOSITION

General description and components (%wt):

Asbestos (<<0.1%), Wet silty/loamy material (99.9%)

Chemical state:

-

Chemical form of radionuclides:

H-3: The chemical form of tritium has not been determined.

C-14: The chemical form of carbon has not been determined.

Se-79: The selenium content is insignificant.

Tc-99: The technetium content is insignificant.

Ra: The radium content is insignificant.

Th: The thorium content is insignificant.

U: The uranium content is insignificant.

Np: The neptunium content is insignificant.

Pu: The plutonium content is insignificant.

Metals and alloys (%wt):

-

Stainless steel.....

Other ferrous metals.....

Iron.....

Aluminium.....

Beryllium.....

Cobalt.....

Copper.....

Lead.....

Magnox/Magnesium.....

Nickel.....

Titanium.....

Uranium.....

Zinc.....

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	Zircaloy/Zirconium.....		
	Other metals.....		
Organics (%wt):	-		
	Total cellulose.....	0	
	Paper, cotton.....		
	Wood.....		
	Halogenated plastics		
	Total non-halogenated plastics.....	0	
	Condensation polymers.....		
	Others.....		
	Organic ion exchange materials....		
	Total rubber.....	0	
	Halogenated rubber		
	Non-halogenated rubber.....		
	Hydrocarbons.....		
	Oil or grease		
	Fuel.....		
	Asphalt/Tarmac (cont.coal tar)...		
	Asphalt/Tarmac (no coal tar)....		
	Bitumen.....		
	Others.....		
	Other organics.....		
Other materials (%wt):	-		
	Inorganic ion exchange materials.		
	Inorganic sludges and flocs.....		
	Soil.....	99.9	silty loamy material and legacy road gully sludge.
	Brick/Stone/Rubble.....		
	Cementitious material.....		
	Sand.....		
	Glass/Ceramics.....		
	Graphite.....		
	Desiccants/Catalysts.....		
	Asbestos.....	<<0.10	
	Non/low friable.....	<<0.10	Asbestos fibres present Blue, brown and white Asbestos from gaskets, textured coating and lagging.
	Moderately friable.....	0	
	Highly friable.....	0	
	Free aqueous liquids.....		
	Free non-aqueous liquids.....		
	Powder/Ash.....		
Inorganic anions (%wt):	-		

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

Materials of interest for
 waste acceptance criteria:

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

Hazardous substances /
 non hazardous pollutants:

-
 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):

EDTA.....
 DPTA.....
 NTA.....
 Polycarboxylic acids.....
 Other organic complexants.....
 Total complexing agents..... 0

TREATMENT, PACKAGING AND DISPOSAL

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

Treatment	On-site / Off site	Stream volume %
Low force compaction		
Supercompaction (HFC)		
Incineration		93.0
Solidification		
Decontamination		
Metal treatment		
Size reduction		
Decay storage		
Recycling / reuse		
Other / various		
None		7.0

Comment on planned treatments:

7% of the stream is expected to be disposed of to landfill as VLLW

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Disposal Route	Stream volume %
Expected to be consigned to the LLW Repository	7.0
Expected to be consigned to a Landfill Facility	
Expected to be consigned to an On-Site Disposal Facility	93.0
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	

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: (Not applicable to this waste stream)

Container	Stream volume %	Waste loading m ³	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: -

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

Container voidage: -

Waste Characterisation Form (WCH):

It is assumed that the sediment will be dried and disposed of in 1m3 Bulk Bags.

Waste consigned for disposal to LLWR in year of generation: -

Potential for the waste to contain discrete items: -

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: -

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RADIOACTIVITY

Source: -

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: Specific activities have been calculated from measurements. Data taken from WCH 1MXN-3TRA-0-WCH-0-3891 and decayed 2 years for RWI 2019

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	1.18E-07	CC 1			Gd 153		8		
Be 10		8			Ho 163		8		
C 14		8			Ho 166m		8		
Na 22		8			Tm 170		8		
Al 26		8			Tm 171		8		
Cl 36		8			Lu 174		8		
Ar 39		8			Lu 176		8		
Ar 42		8			Hf 178n		8		
K 40	6.43E-07	CC 1			Hf 182		8		
Ca 41		8			Pt 193		8		
Mn 53		8			Tl 204		8		
Mn 54		8			Pb 205		8		
Fe 55		8			Pb 210	6.23E-07	CC 1		
Co 60	5.31E-08	CC 1			Bi 208		8		
Ni 59		8			Bi 210m		8		
Ni 63		8			Po 210	6.15E-07	CC 1		
Zn 65		8			Ra 223		8		
Se 79		8			Ra 225		8		
Kr 81		8			Ra 226	6.91E-08	CC 1		
Kr 85		8			Ra 228		8		
Rb 87		8			Ac 227		8		
Sr 90	9.82E-07	CC 1			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		8			U 233		8		
Pd 107		8			U 234		8		
Ag 108m		8			U 235	3.34E-09	CC 1		
Ag 110m		8			U 236		8		
Cd 109		8			U 238		8		
Cd 113m		8			Np 237		8		
Sn 119m		8			Pu 236		8		
Sn 121m		8			Pu 238	7.01E-08	CC 1		
Sn 123		8			Pu 239	2.2E-07	CC 1		
Sn 126		8			Pu 240	2.2E-07	CC 1		
Sb 125		8			Pu 241	1.73E-06	CC 1		
Sb 126		8			Pu 242		8		
Te 125m		8			Am 241	4.23E-07	CC 1		
Te 127m		8			Am 242m		8		
I 129		8			Am 243		8		
Cs 134		8			Cm 242		8		
Cs 135		8			Cm 243		8		
Cs 137	1.68E-05	CC 1			Cm 244		8		
Ba 133		8			Cm 245		8		
La 137		8			Cm 246		8		
La 138		8			Cm 248		8		
Ce 144		8			Cf 249		8		
Pm 145		8			Cf 250		8		
Pm 147		8			Cf 251		8		
Sm 147		8			Cf 252		8		
Sm 151		8			Other a				
Eu 152		8			Other b/g				
Eu 154		8			Total a	1.62E-06	CC 2	0	
Eu 155		8			Total b/g	2.10E-05	CC 2	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