

WASTE STREAM	9G121	Active Drains (Final Delay Tank)
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SITE Trawsfynydd
SITE OWNER Nuclear Decommissioning Authority
WASTE CUSTODIAN Magnox Limited
WASTE TYPE LLW

WASTE VOLUMES

		Reported
Stocks:	At 1.4.2019.....	~0 m ³
Future arisings -	1.4.2019 - 31.3.2020.....	0.6 m ³
Total future arisings:		0.6 m ³
Total waste volume:		0.6 m ³

Comment on volumes: -

Uncertainty factors on volumes:	Stock (upper): x	Arisings (upper) x 1.2
	Stock (lower): x	Arisings (lower) x 0.8

WASTE SOURCE -

PHYSICAL CHARACTERISTICS

General description: Waste consists of sludge (oil, water & silt), plastic pipework, metal, bracketry and metal valve assemblies, soil and rubble and other organics

Physical components (%wt): Solid metal from active drains system (20%), Plastic pipework from active drains system (20%), Sludge from active drains (oil, water and silt) (60%), Asbestos (~0.1%).

Sealed sources: -

Bulk density (t/m³): 0.1

Comment on density: WCH mass divided by volume

CHEMICAL COMPOSITION

General description and components (%wt): -

Chemical state: -

Chemical form of radionuclides: -

Metals and alloys (%wt): -

Stainless steel.....		
Other ferrous metals.....		
Iron.....	~20.0	Solid metal from Active Drains system
Aluminium.....		
Beryllium.....		
Cobalt.....		
Copper.....		
Lead.....		
Magnox/Magnesium.....		
Nickel.....		
Titanium.....		
Uranium.....		
Zinc.....		
Zircaloy/Zirconium.....		
Other metals.....		

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Organics (%wt):

-	
Total celluloseics.....	0
Paper, cotton.....	
Wood.....	
Halogenated plastics	
Total non-halogenated plastics.....	20.0
Condensation polymers.....	
Others.....	~20.0
	Plastic pipework from Active Drains system
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.....	~60.0
	Sludge from active drains (a mixture of oil, water and silt).
Soil.....	
Brick/Stone/Rubble.....	
Cementitious material.....	
Sand.....	
Glass/Ceramics.....	<0.10
	MMMF lagging
Graphite.....	
Desiccants/Catalysts.....	
Asbestos.....	<0.10
Non/low friable.....	<0.10
	Asbestos contamination - Mixture of asbestos from textured coatings, lagging and gaskets etc. Made up of white, brown and blue asbestos.
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.....

TREATMENT, PACKAGING AND DISPOSAL

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

Treatment	On-site / Off site	Stream volume %
Low force compaction	Off-site	80.0
Supercompaction (HFC)		
Incineration		
Solidification		
Decontamination		
Metal treatment		
Size reduction		
Decay storage		
Recycling / reuse		
Other / various		
None		20.0

Comment on planned treatments:

20% VLLW landfill disposal

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Disposal Route	Stream volume %
Expected to be consigned to the LLW Repository	20.0
Expected to be consigned to a Landfill Facility	
Expected to be consigned to an On-Site Disposal Facility	80.0
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): -

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: -

RADIOACTIVITY

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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:

Data taken from WCH - 1-MXN-3TRA-0-WCH-0-3889 and decayed by 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			4.49E-06	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				8	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				8
Co 60				8	Bi 208				8
Ni 59				8	Bi 210m				8
Ni 63				8	Po 210				8
Zn 65				8	Ra 223				8
Se 79				8	Ra 225				8
Kr 81				8	Ra 226				8
Kr 85				8	Ra 228				8
Rb 87				8	Ac 227				8
Sr 90			5.44E-08	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				8
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		2.82E-08	CC 1	
Sn 123				8	Pu 239		8.57E-08	CC 1	
Sn 126				8	Pu 240		8.57E-08	CC 1	
Sb 125				8	Pu 241		9.36E-07	CC 1	
Sb 126				8	Pu 242				8
Te 125m				8	Am 241		1.17E-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		3.64E-08	CC 1	
Cs 137			4.46E-07	CC 1	Cm 244		3.53E-08	CC 1	
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			2.25E-08	CC 1	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	0	3.88E-07	CC 1	
Eu 155				8	Total b/g	0	5.95E-06	CC 1	

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