

WASTE STREAM	9G71	Diversion Culvert Silt
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SITE Trawsfynydd

SITE OWNER Nuclear Decommissioning Authority

WASTE CUSTODIAN Nuclear Restoration Services Ltd (NRS)

WASTE TYPE LLW

WASTE VOLUMES

	Reported (m ³)	OR	Conditioned (m ³)	Packaged (m ³)
Stocks:	At 1.4.2025	0		
Future arisings:	1.4.2027 - 31.3.2028	10.0		
Total future arisings:		10.0		
Total waste volume:		10.0		

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

Comment on arising rates: -

Additional information on quantities: -

Uncertainty factors on volumes:

Stock (upper):	x -	Arisings (upper):	x 1.20
Stock (lower):	x -	Arisings (lower):	x 0.80

WASTE SOURCE Non-oily sludge and silt accumulations in the Diversion Culvert and Diversion Culvert Oil Interceptor (DCOI) along with associated waste such as piping, valve sections, scaffolding, softwaste, rubber and control instrumentation. The sludge manifests from the collection of site-wide surface water drainage from non-active areas. Some asbestos contaminated materials may be present e.g. gratings, cements, insulation covers.

PHYSICAL CHARACTERISTICS

General description: The sludge/silt material ranges from powdery silt submerged in the water to the semi-dry loamy consistency. From chemical analysis it has been confirmed that the petroleum hydrocarbon content in the material ranges from 420-300mg/kg with total organic carbon of 80-860mg/kg based on a range of samples taken from various location within the DCOI prior to cleaning.

Changes since waste generated: -

Bulk density (t/m³): = 2.2

Comment on density: -

CHEMICAL COMPOSITION

General description and components (%wt): Metal 5%, Soil 76%, Biodegradable- non putrescibles 1%, Plastics (halogenated) <1% Plastics (non-halogenated) <1%, Rubber 1%, Other organic (including oily contaminated sludges and silts) 14% others (some asbestos contamination) <1%

Chemical state: -

Sheet metal proportion / thickness: -

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	-	-	-
Other ferrous metals.....	= 4.6	7920 kg mild steel scaffolding, pipework and valve sections	-
Iron.....	-	-	-
Aluminium.....	-	-	-
Beryllium.....	-	-	-
Cobalt.....	-	-	-
Copper.....	-	-	-
Lead.....	-	-	-
Magnox/Magnesium.....	-	-	-
Nickel.....	-	-	-
Titanium.....	-	-	-
Uranium.....	-	-	-
Zinc.....	-	-	-
Zircaloy/Zirconium.....	-	-	-
Other metals.....	-	-	-

Organics (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulotics.....	0	-	
Paper, cotton.....		-	
Wood.....		-	
Halogenated plastics.....	= 0.25	Pipework, plastic sheeting & valves	
Total non-halogenated plastics.....	= 0.25	PPE, sample bottles visqueen	
Condensation polymers.....	= 0.13		
Others.....	= 0.13		
Organic ion exchange materials.....		-	
Total rubber.....	1.0	-	
Halogenated rubber.....	~ 0.50	-	
Non-halogenated rubber.....	~ 0.50	-	
Hydrocarbons.....	0.02	-	
Oil or grease.....	= 0.02	White mineral oil	
Fuel.....		-	
Asphalt/Tarmac (cont.coal tar).....		-	
Asphalt/Tarmac (no coal tar).....		-	
Bitumen.....		-	
Others.....		-	
Other organics.....	= 10.1	Oily silt and sludge	

Other materials (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Inorganic ion exchange materials.....		-	
Inorganic sludges and flocs.....	= 3.9	Sludge/silt and soil	
Soil.....	= 76.0	silty loamy material and legacy road gully sludge.	
Brick/Stone/Rubble.....		-	
Cementitious material.....		-	
Sand.....		-	
Glass/Ceramics.....		-	
Graphite.....		-	
Desiccants/Catalysts.....		-	
Asbestos.....	<< 0.05	-	
Non/low friable.....	<< 0.05	Asbestos contaminated material, gratings, cements, insulation covers. Equal portions of white, brown and blue asbestos assumed.	
Moderately friable.....	= 0	-	
Highly friable.....	= 0	-	
Free aqueous liquids.....		-	
Free non-aqueous liquids.....		-	
Powder/Ash.....		-	

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

Inorganic anions (%wt):

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

Materials of interest for waste acceptance criteria:

	(%wt)	Type(s) and comment
Combustible metals.....		-
Low flash point liquids.....		-
Explosive materials.....		-
Phosphorus.....		-
Hydrides.....		-
Biological etc. materials.....		-
Biodegradable materials.....	1.0	-
Putrescible wastes.....		-
Non-putrescible wastes.....	= 1.0	-
Corrosive materials.....		-
Pyrophoric materials.....		-
Generating toxic gases.....		-
Reacting with water.....		-
Higher activity particles.....		-
Soluble solids as bulk chemical compounds.....		-

Hazardous substances / non hazardous pollutants:

	(%wt)	Type(s) and comment
Acrylamide.....	0	-
Benzene.....		-
Chlorinated solvents.....		-
Formaldehyde.....		-
Organometallics.....		-
Phenol.....		-
Styrene.....		-
Tri-butyl phosphate.....		-
Other organophosphates.....		-
Vinyl chloride.....		-
Arsenic.....		-
Barium.....		-
Boron.....		-
Boron (in Boral).....		-
Boron (non-Boral).....		-
Cadmium.....		-
Caesium.....		-
Selenium.....		-
Chromium.....		-
Molybdenum.....		-
Thallium.....		-
Tin.....		-
Vanadium.....		-
Mercury compounds.....		-
Others.....		-

Complexing agents (%wt):

Yes		
	(%wt)	Type(s) and comment
EDTA.....	= 0.06	-
DPTA.....		-
NTA.....		-
Polycarboxylic acids.....		-
Other organic complexants.....		Decon-90
Total complexing agents.....		= 0.06

Physical components:

	Number	Type(s) and comment
Sources.....	= 19	-
Electronic & Electrical Equipment (EEE)		-
EEE Type 1.....		19 circuit boards
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	Off-site	89.1
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		10.9

Comments on planned treatments:

10.76% of the stream is expected to be disposed of to landfill as VLLW.

Conditioning method:

-

Conditioning plants:

Plant Name	Location

Likely conditioning matrix:

-

Further information on the conditioning matrix:

-

Waste Packaging:

Likely container type:	Container	Waste packaged (vol%)	Waste loading (m³)	Payload (m³)	Number of packages	Estimated start date for packaging
	1/2 Height IP-2 Disposal/Re-usable ISO (TC01/TC02)	0.1	10.0	18.3	0	-

Range in container waste loading: -

Other information on packaging and conditioning: -

Conditioned density (t/m³): -
Conditioned density comment: -**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)			
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	= 0.1	2.2	
Expected to be consigned to a Landfill Facility	= 10.8	2.2	
Expected to be disposed On-Site			
Expected to be managed by In-Situ Disposal			
Expected to be consigned to an Incineration Facility	= 89.1	0.40	
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: 17 05 03*, 17 05 04

Opportunities for alternative disposal routing: No

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

RADIOACTIVITY

Source: -

Uncertainty: -

Measurement of radioactivities: Specific activities have been calculated from measurements.

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.
Cl-36: -
Se-79: The selenium content is insignificant.
Tc-99: The technetium content is insignificant.
I-129: -
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.

WASTE STREAM		9G71		Diversion Culvert Silt					
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			1.46E-07	C C 2	Gd 153				8
Be 10				8	Ho 163				8
C 14			1.66E-08	C C 2	Ho 166m				8
Na 22				8	Tm 170				8
Al 26				8	Tm 171				8
Cl 36			4.31E-08	C C 2	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			7.53E-09	C C 2	Pb 210				8
Co 60			4.31E-08	C C 2	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			1.68E-06	C C 2	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			8.51E-08	C C 2	Th 234			3.80E-09	C C 2
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			4.05E-09	C C 2
Ag 108m				8	U 235			1.51E-08	C C 2
Ag 110m				8	U 236			4.81E-09	C C 2
Cd 109				8	U 238			3.80E-09	C C 2
Cd 113m				8	Np 237				8
Sn 119m				8	Pu 236				8
Sn 121m				8	Pu 238			1.93E-07	C C 2
Sn 123				8	Pu 239			2.96E-07	C C 2
Sn 126				8	Pu 240			3.81E-07	C C 2
Sb 125			1.83E-08	C C 2	Pu 241			4.76E-06	C C 2
Sb 126				8	Pu 242				8
Te 125m			4.57E-09	C C 2	Am 241			1.70E-06	C C 2
Te 127m				8	Am 242m				8
I 129			1.27E-09	C C 2	Am 243				8
Cs 134			2.95E-09	C C 2	Cm 242				8
Cs 135				8	Cm 243				8
Cs 137			2.31E-05	C C 2	Cm 244			7.06E-09	C C 2
Ba 133			3.47E-08	C C 2	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	Unsp a				
Eu 152			4.58E-08	C C 2	Unsp b/g				
Eu 154			4.38E-08	C C 2	Total a	0	*	2.60E-06	*
Eu 155			4.56E-08	C C 2	Total b/g	0	*	3.01E-05	*

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