

WASTE STREAM	9D76	Effluent Treatment Plant Sludge LLW
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SITE Hinkley Point A

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:	1.4.2030 - 31.3.2031	2.6		
Total future arisings:		2.6		
Total waste volume:		2.6		

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

Comment on arising rates: -

Additional information on quantities: Transferred from 9D913 in 2009. Sludge recovered from FMDTs and TETs. 2025/26 arisings have been moved in from 9D928 and are from Building 35 Rad Pump House , Reactor 2 Sullage Pit, Main Change Pumping Station and New ACP sump.

Uncertainty factors on volumes: Stock (upper): x - Arisings (upper): x 1.20
Stock (lower): x - Arisings (lower): x 0.80

WASTE SOURCE Sludge that was generated during the operation of the Effluent Treatment Plant.

PHYSICAL CHARACTERISTICS

General description: The waste consists of debris washed from persons, floors and clothing,. There are no large items that may require special handling.

Changes since waste generated: -

Bulk density (t/m³): ~ 1.5

Comment on density: Average density of a number of discrete samples.

CHEMICAL COMPOSITION

General description and components (%wt): Water (~83% wt) sludge (~17% wt) which includes chlorides, nitrates and sulphates

Chemical state: Acid

Sheet metal proportion / thickness: No sheet or bulk metal present.

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	= 0	-	
Other ferrous metals.....	= 0	-	
Iron.....		-	
Aluminium.....	= 0	-	
Beryllium.....	0	-	
Cobalt.....		-	
Copper.....	= 0	-	
Lead.....	= 0	-	
Magnox/Magnesium.....	= 0	-	
Nickel.....		-	
Titanium.....		-	
Uranium.....		-	
Zinc.....	= 0	-	
Zircaloy/Zirconium.....	= 0	-	
Other metals.....	= 0	-	

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.....		-	
Oil or grease.....		-	
Fuel.....		-	
Asphalt/Tarmac (cont.coal tar).....		-	
Asphalt/Tarmac (no coal tar).....		-	
Bitumen.....		-	
Others.....		-	
Other organics.....	= 0	-	

Other materials (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Inorganic ion exchange materials.....	= 0	-	
Inorganic sludges and flocs.....	= 17.0	-	
Soil.....	= 0	-	
Brick/Stone/Rubble.....	= 0	-	
Cementitious material.....	= 0	-	
Sand.....		-	
Glass/Ceramics.....	TR	-	
Graphite.....	= 0	-	
Desiccants/Catalysts.....		-	
Asbestos.....	= 0	-	
Non/low friable.....		-	
Moderately friable.....		-	
Highly friable.....		-	
Free aqueous liquids.....	= 83.0	-	
Free non-aqueous liquids.....	= 0	-	
Powder/Ash.....	= 0	-	

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

Inorganic anions (%wt):

	(%wt)	Type(s) and comment
Fluoride.....		-
Chloride.....	= 0.10	-
Iodide.....		-
Cyanide.....	= 0	-
Carbonate.....		-
Nitrate.....		-
Nitrite.....	= 0	-
Phosphate.....		-
Sulphate.....	= 2.4	-
Sulphide.....		-

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.....		-
Corrosive materials.....	= 0	-
Pyrophoric materials.....	= 0	-
Generating toxic gases.....	= 0	-
Reacting with water.....	= 0	-
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):

No		
	(%wt)	Type(s) and comment
EDTA.....	0	-
DPTA.....		-
NTA.....		-
Polycarboxylic acids.....		-
Other organic complexants.....		-
Total complexing agents.....		-

Physical components:

	Number	Type(s) and comment
Sources.....		-
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		= 100.0
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		

Comments on planned treatments:

-

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)	100.0	2.4	18.3	2	-

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)	= 100.0	1.5	
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: Activation and contamination of materials.

Uncertainty: Activity values are current best estimates. The values quoted are indicative of the activities that are expected. They are estimates based upon operating experience.

Measurement of radioactivities: Specific activities have been estimated from a radionuclide fingerprint derived from measurements.

Chemical form of radionuclides:

H-3: Most tritium is expected to be present as water but some may be present in the form of other inorganic or organic compounds.

C-14: Contamination in the form of graphite dust.

Cl-36: Chlorine 36 may be present as a contaminant of graphite dust.

Se-79: The selenium content is insignificant.

Tc-99: The technetium content is insignificant.

I-129: -

Ra: The radium isotope content is insignificant.

Th: The thorium content is insignificant.

U: The chemical form of uranium isotopes has not been determined but will probably be uranium oxides.

Np: The neptunium content is insignificant.

Pu: The chemical form of plutonium isotopes has not been determined but will probably be plutonium oxides.

WASTE STREAM 9D76 Effluent Treatment Plant Sludge LLW									
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			2.52E-05	C C 1	Gd 153				8
Be 10				8	Ho 163				8
C 14			7.15E-06	C C 1	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			< 9.28E-06	D 3	Hf 182				8
Ca 41				8	Pt 193				8
Mn 53				8	Ti 204				8
Mn 54				8	Pb 205				8
Fe 55			1.29E-06	C C 1	Pb 210			< 2.22E-05	D 3
Co 60			3.88E-06	C C 1	Bi 208				8
Ni 59				8	Bi 210m			< 1.31E-05	D 3
Ni 63			1.60E-05	C C 1	Po 210			< 2.19E-05	D 3
Zn 65				8	Ra 223				8
Se 79				8	Ra 225				8
Kr 81				8	Ra 226			< 4.28E-05	D 3
Kr 85				8	Ra 228				8
Rb 87				8	Ac 227				8
Sr 90			1.91E-04	C C 1	Th 227				8
Zr 93				8	Th 228			1.18E-09	C C 2
Nb 91				8	Th 229				8
Nb 92				8	Th 230				8
Nb 93m				8	Th 232				8
Nb 94				8	Th 234			< 4.22E-08	D 3
Mo 93				8	Pa 231				8
Tc 97				8	Pa 233			< 7.36E-06	D 3
Tc 99			6.13E-07	C C 1	U 232			1.30E-09	C C 1
Ru 106			< 1.41E-09	D 3	U 233			< 1.19E-08	D 3
Pd 107				8	U 234			4.27E-08	C C 1
Ag 108m				8	U 235			1.10E-09	C C 1
Ag 110m				8	U 236			4.20E-09	C C 1
Cd 109				8	U 238			4.22E-08	C C 1
Cd 113m				8	Np 237			< 7.36E-06	D 3
Sn 119m				8	Pu 236				8
Sn 121m				8	Pu 238			2.06E-05	C C 1
Sn 123				8	Pu 239			2.13E-05	C C 1
Sn 126				8	Pu 240			2.83E-05	C C 1
Sb 125			< 2.70E-07	D 3	Pu 241			2.98E-04	C C 1
Sb 126				8	Pu 242			< 4.22E-07	D 3
Te 125m			< 6.77E-08	D 3	Am 241			1.06E-04	C C 1
Te 127m				8	Am 242m				8
I 129			< 2.21E-07	D 3	Am 243				8
Cs 134			7.71E-07	C C 1	Cm 242				8
Cs 135				8	Cm 243			7.74E-08	C C 1
Cs 137			3.66E-03	C C 1	Cm 244			1.50E-06	C C 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				8	Cf 251				8
Sm 147				8	Cf 252				8
Sm 151				8	Unsp a				
Eu 152			< 4.06E-07	D 3	Unsp b/g				
Eu 154			3.18E-06	C C 1	Total a	0	*	2.63E-04	*
Eu 155			8.39E-07	C C 1	Total b/g	0	*	4.25E-03	*

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