

LEGEND									
WASTE STREAM	Generical definition of the waste stream (origin, physical state, type, properties, process options)								
DESCRIPTION	Any additional information that can be useful to better explain waste characteristics								
CLASSIFICATION	Waste classification possibly aligned with the following IAEA classification: VLLW, LLW, ILW (for the scope of the survey, HLW are excluded)								
	<table border="1"> <tr> <th>Category</th> <th>Conditions</th> </tr> <tr> <td>Very Low Level Waste (VLLW)</td> <td>Very low level waste (VLLW): Waste that does not necessarily meet the criteria of EW, but that does not need a high level of containment and isolation and, therefore, is suitable for disposal in near surface landfill type facilities with limited regulatory control. Such landfill type facilities may also contain other hazardous waste. Typical waste in this class includes soil and rubble with low levels of activity concentration. Concentrations of longer lived radionuclides in VLLW are generally very limited</td> </tr> <tr> <td>Low Level Waste (LLW)</td> <td>Low level waste (LLW): Waste that is above clearance levels, but with limited amounts of long lived radionuclides. Such waste requires robust isolation and containment for periods of up to a few hundred years and is suitable for disposal in engineered near surface facilities. This class covers a very broad range of waste. LLW may include short lived radionuclides at higher levels of activity concentration, and also long lived radionuclides, but only at relatively low levels of activity concentration</td> </tr> <tr> <td>Intermediate Level Waste (ILW)</td> <td>Intermediate level waste (ILW): Waste that, because of its content, particularly of long lived radionuclides, requires a greater degree of containment and isolation than that provided by near surface disposal. However, ILW needs no provision, or only limited provision, for heat dissipation during its storage and disposal. ILW may contain long lived radionuclides, in particular, alpha emitting radionuclides that will not decay to a level of activity concentration acceptable for near surface disposal during the time for which institutional controls can be relied upon. Therefore, waste in this class requires disposal at greater depths, of the order of tens of metres to a few hundred metres.</td> </tr> </table>	Category	Conditions	Very Low Level Waste (VLLW)	Very low level waste (VLLW): Waste that does not necessarily meet the criteria of EW, but that does not need a high level of containment and isolation and, therefore, is suitable for disposal in near surface landfill type facilities with limited regulatory control. Such landfill type facilities may also contain other hazardous waste. Typical waste in this class includes soil and rubble with low levels of activity concentration. Concentrations of longer lived radionuclides in VLLW are generally very limited	Low Level Waste (LLW)	Low level waste (LLW): Waste that is above clearance levels, but with limited amounts of long lived radionuclides. Such waste requires robust isolation and containment for periods of up to a few hundred years and is suitable for disposal in engineered near surface facilities. This class covers a very broad range of waste. LLW may include short lived radionuclides at higher levels of activity concentration, and also long lived radionuclides, but only at relatively low levels of activity concentration	Intermediate Level Waste (ILW)	Intermediate level waste (ILW): Waste that, because of its content, particularly of long lived radionuclides, requires a greater degree of containment and isolation than that provided by near surface disposal. However, ILW needs no provision, or only limited provision, for heat dissipation during its storage and disposal. ILW may contain long lived radionuclides, in particular, alpha emitting radionuclides that will not decay to a level of activity concentration acceptable for near surface disposal during the time for which institutional controls can be relied upon. Therefore, waste in this class requires disposal at greater depths, of the order of tens of metres to a few hundred metres.
	Category	Conditions							
	Very Low Level Waste (VLLW)	Very low level waste (VLLW): Waste that does not necessarily meet the criteria of EW, but that does not need a high level of containment and isolation and, therefore, is suitable for disposal in near surface landfill type facilities with limited regulatory control. Such landfill type facilities may also contain other hazardous waste. Typical waste in this class includes soil and rubble with low levels of activity concentration. Concentrations of longer lived radionuclides in VLLW are generally very limited							
Low Level Waste (LLW)	Low level waste (LLW): Waste that is above clearance levels, but with limited amounts of long lived radionuclides. Such waste requires robust isolation and containment for periods of up to a few hundred years and is suitable for disposal in engineered near surface facilities. This class covers a very broad range of waste. LLW may include short lived radionuclides at higher levels of activity concentration, and also long lived radionuclides, but only at relatively low levels of activity concentration								
Intermediate Level Waste (ILW)	Intermediate level waste (ILW): Waste that, because of its content, particularly of long lived radionuclides, requires a greater degree of containment and isolation than that provided by near surface disposal. However, ILW needs no provision, or only limited provision, for heat dissipation during its storage and disposal. ILW may contain long lived radionuclides, in particular, alpha emitting radionuclides that will not decay to a level of activity concentration acceptable for near surface disposal during the time for which institutional controls can be relied upon. Therefore, waste in this class requires disposal at greater depths, of the order of tens of metres to a few hundred metres.								
CURRENT STATUS	Raw: waste containerized in the original form, i.e. not treated								
	Treated: Treated waste (volume reduced; removal of radionuclides from the waste; change of composition) and containerized								
	Encapsulated: solid waste embedded in cement or other matrix								
	Conditioned: operations that produce a waste package suitable for handling, transport, storage and/or disposal								
WASTE STREAM CHARACTERISTICS	Physical Characteristics	Main physical characteristics							
	Chemical Characteristics (CMR material, reactive, degrading, etc.)	Whatever element or complex that can impact on waste treatment and/or waste form durability, repository safety, human and environmental safety (e.g. flammables, explosives, free liquids, biological or toxic materials, complexants, water-soluble chlorides and sulphates, other aggressive chemicals) - CMR (Carcinogenic, Mutagenic, toxic for Reproduction)							
	Current packaged volume	Referred to the whole waste stream							
	Mass	Referred to the whole waste stream							
	Current container typology	Indicate the typology of the container in which the waste is currently packaged							
	Total Activity	Indicate total activity of the whole waste stream							
	Main Radionuclides	Indicate main waste stream radionuclides							
RADIOLOGICAL CHARACTERIZATION	Availability of radiological characterization data (Yes/No)	Indicate if characterization data are available for the waste stream							
	Reliability of radiological characterization data (Low/Medium/High)	Indicate the reliability of the available characterization data: - LOW: e.g. historical data of doubtful origin; derived by dose rate; etc. - HIGH: complete characterization alpha, beta, gamma (Non Destructive Assay/Destructive Assay) - MEDIUM: all other characterization levels between LOW and HIGH							
	Planned radiological characterization methodology (if any; in case of unavailability or LOW reliability of data)	In case of unavailability or LOW reliability of data, indicate in this field if your country is planning some additional characterization and, in the affirmative case, which methodology will be employed (i.e. dose rate, ISOCS, IGS, SGS, Tomography)							
CHEMICAL CHARACTERIZATION	Availability of chemical characterization data (Yes/No)	Indicate if characterization data are available for the waste stream							
	Reliability of chemical characterization data (Low/Medium/High)	Indicate the reliability of the available characterization data: - LOW: e.g. historical data of doubtful origin - HIGH: complete chemical characterization by means of lab analysis - MEDIUM: all other characterization levels between LOW and HIGH							
	Planned chemical characterization methodology (if any; in case of unavailability or LOW reliability of data)	In case of unavailability or LOW reliability of data, indicate in this field if your country is planning some additional characterization and, in the affirmative case, which methodology will be employed							
Expected Disposal Facility Type (near surface/other)		NEAR SURFACE: if the waste stream is expected to comply with near surface WACs (Name of the Repository if available) OTHER (Medium depth, geological): if the radioactive content of the waste stream is expected NOT to comply with near surface WACs							
WASTE TREATMENT AND/OR CONDITIONING PROCESS	Planned waste treatment process (if any)	Indicate the treatment and/or conditioning process (if any) which has been identified (even as preliminary)							
	Implementation phase (Qualified/In course/R&D/Concept)	Indicate the progress of the identified treatment process Qualified: the process is qualified and approved by Authority In course: the process is being qualified R&D: the process is being studied as R&D Concept: the process is just in the concept phase							
Reference WACs		Indicate the WACs (if any) used as reference in your Waste Management System for the waste stream							
Criticalities		Indicate the aspects for which the management of the waste stream could pose possible criticalities							

N	WASTE STREAM	COUNTRY	CLASSIFICATION	Waste Stream Radiological Characterization				EXPECTED DISPOSAL FACILITY TYPE (Near Surface/Other)
				Total Activity (Bq)	Main Radionuclides	Current packaged volume (m3)	Mass (kg)	
1	Disused Sealed Radioactive Sources (DSRS)	CROATIA	LLW/ILW	3,05E+12	Fe55, Co60, Kr85, Sr90, Ir92, Gd153, Kr85, Sr90, Cm247, Ni63, Tl204, Cm247, Ba133, Cd109, Cs137, Pm147, Eu152, 154, Ra226, Ra226/Be, Am241/Be	N.A.	N.A.	Near Surface/Other
		DENMARK	No national classification scheme	N.A.	Charcterisation in progress	N.A.	N.A.	Other (DGR)
		ITALY	No national classification scheme	1,22E+15	H3, Cs137, Ra226, C14, Co60, U238, Kr85, Cm244, Ni63, Sr90, Am241, Ra226, alpha sources, beta sources	5,11E+02	1,35E+04	Other
		GREECE	LLW/ ILW	7,70E+09	Am241, Ra226, Co60, alpha sources, beta sources, neutron sources	1,80E+00	N.A.	Other (possibly multi-purposes borehole)
		NORWAY	LLW/ILW	Unknown	Ra226 or Am241	N.A.	N.A.	Near Surface/Other
AUSTRIA	LILW-SL and LL (in case of Am-241 and Ra-226 sources)	24,8E3 GBq (not decay corrected)	Cs-137, Co-60, Am-241, Kr-85, Sr-90, H-3, Ra-226, Pm-147, Ir-192	130 drums	N.A.	To be determined		
2	Solid Mixed Waste	CROATIA	LLW/No classification	N.A.	Ra226, Cs137, Bi207, Pb210, Eu152, U238, Th234, Co57, Co60, Am241, mixture	N.A.	3,06E+03	Near Surface
		DENMARK	No national classification scheme	6,00E+12	Charcterisation in progress	ca 5400 drums	Not compiled	Other (DGR)
		ITALY	ILW	4,37E+11	Cs137, U238, Cm244, Eu154, Pu238, Pu241, Sr90	4,38E+01	8,25E+02	Other
		GREECE	LLW/ ILW	N.A.	Cs137, Co-60, Ag-108m, Eu-152, Tc-99 etc, Ra-226, Am-241, Th232, Sr-90, deU	2,40E+01	N.A.	Near surface/ Other (possibly multi-purposes borehole)
		AUSTRIA	LILW-SL and LL	1,8E3 GBq (not decay corrected)	Sr-90, H-3, C-14, Cs-137, Pu-241, Am-241, Co-60	about 4000 drums	Not available before reconditioning	To be determined (Near Surface)
NETHERLAND	LILW		Cs-137	not yet available		Other (GDF)		
3	Powdery Waste	CROATIA	LLW	N.A.	Eu152	Not available	4,80E+02	Near Surface
		ITALY	VLLW/LLW	2,92E+10	Cs137, Eu154, Sr90, Pu241, C14, H3, U236, U238	1,55E+03	1,84E+06	Near surface
		GREECE	LLW	N.A.	Pu-238, Pu-239, Pu-240, Pu-241	6,00E-01	N.A.	Near surface
		NORWAY	ILW (long lived alpha activity concentration expected to be > 400 Bq/g)	Unknown	Unknown (various radionuclides including Actinides- Pu)	5,48E+01	82200 (dry desity of 1.5 t/m3)	Other
4	Sludges	DENMARK	No national classification scheme	N.A.	Charcterisation in progress	N.A.	N.A.	Other (DGR)
		ITALY	VLLW/LLW	1,33E+09	Ni59, Ni63, Co60, Cs137	1,16E+01	5,12E+03	Near surface
		GREECE	VLLW/ LLW	Unknown	Ni63, Co60, Cs137, Ag-108m, Eu-152	2,00E-01	N.A.	Near surface
		NORWAY	LLW/ILW	N.A.	Activation and fission Products e.g. Cs137, Fe55, Co60, Sr90, Uranium, Actinides (Am241, Pu239, Pu240, Pu241)	N.A.	N.A.	Near surface/Other
		AUSTRIA	LILW-SL and LL (in case of alpha nuclides in the ashes)	173 GBq (not decay corrected)	Co-60, Cs-137, Th-232, Am-241, Ra-226Eu-154, Ag-108m	about 3500 drums	360 kg per drum on average	To be determined (Near Surface)
5	Ion Exchange Resins	DENMARK	No national classification scheme	N.A.	Charcterisation in progress	N.A.	N.A.	Other (DGR)
		ITALY	VLLW/LLW/ILW	5,57E+13	Cs137, Fe55, Co60, Sr90, Am241, U238, Pu239, Pu240, Pu241, Ni59, Ni63	1,24E+02	1,81E+05	Near surface/Other
		GREECE	VLLW/LLW	2,50E+08	Cs137, Ag-108m, Co60, Eu-152	1,60E+01	1,58E+04	Near surface
		NORWAY	LLW/ILW	N.A.	Cs137, Fe55, Co60, Sr90, Am241	N.A.	N.A.	Near surface
		NETHERLAND	ILW & LLW		Cs-137, Sb-125, Cd-109, Co-60, Sr-90, Ni-63 Fe-55	3,80E+00	1,81E+04	Other (GDF)
6	Solid Organic waste	DENMARK	No national classification scheme	N.A.	Charcterisation in progress	N.A.	N.A.	Other (DGR)
		ITALY	VLLW	2,93E+08	C14, H13, Am241, Co60, Cs137, Eu152, Eu154, Ni63, Pu241	1,85E+01	5,62E+03	Near Surface
		NETHERLAND	LILW		PVC the problem, not the nuclides, which varies	few cubic meters,		Other (GDF)
7	Liquid Organic Waste	ITALY	VLLW/ LLW/ ILW	2,27E+11	U234, U235, U238, Cs137, Sr90, Ra228, Th228, Th232, Am241, Pu239, Pu240, Pu241	9,26E+00	3,86E+03	Near surface/Other
		NETHERLAND	LLW		C-14, Fe-55, H-3, Cl-36, Cd-109, Co-60, Sr-90, Cd-113m, Ni-63, Sb-125, Eu-154	4,36E+01	4,36E+04	Other (GDF)
		NORWAY	ILW	Unknown	Uranium, actinides (Am241, Pu239, Pu240, Pu241) and fission products Cs-137, Sr 90 etc. ?	3,00E-01	3,00E+02	Other
8	Graphite	DENMARK	As above	Not compiled	Charcterisation in progress	Not compiled	ca. 19 t	Other (DGR)
		ITALY	ILW	3,00E+14	C14, H3, Co60, Cs137, Cl39, Fe 55	1,61E+03	2,11E+03	Other
		GREECE	VLLW/ LLW/ ILW	4,50E+10	H3, C14, Co60, Cl36, Eu152, Eu154, Fe55	3,80E+00	6,10E+03	Other (possibly multi-purposes borehole)
		NORWAY	ILW	?	C14, H3, Co60, Cs137, Cl39, Fe55	?	?	Near surface/Other
9	Metals	ITALY	ILW	3,41E+14	Am241, Co60, Cs137, Ni63, Pu238, Pu239, Pu240, Pu241, Sr90	9,00E+01	3,38E+04	Near surface/Other
		GREECE	VLLW/ LLW/ ILW	N.A.	Co60, Ni63, Fe55, Cs137, Sr90, Pu238, Pu239, Pu240, Pu241	2,00E+01	-	Near surface/ Other (possibly multi-purposes borehole)
		NETHERLAND	ILW & LLW		Co-60, Ni-63 Fe-55			Other (GDF)
10	Alfa Bearing Solid Waste	DENMARK	No national classification scheme		Charcterisation in progress	Not compiled		Other (DGR)
		GREECE	LLW/ ILW	N.A.	Ra-226, Pu-238, Pu-239, Pu-240, Pu-242	1,00E+02	N.A.	Near surface/ Other (possibly multi-purposes borehole)
		NORWAY	LLW/ILW	N.A.	Uranium radionuclides, actinides (Am241, Pu239, Pu240, Pu241) and fission products Cs-137, Sr 90 etc. ?	N.A.	N.A.	Near surface/Other
		ITALY	ILW	1,79E+13	Pu238, Pu239, Pu240, Pu241, Pu242, Th232, U235, U238, Am241	3,21E+02	1,12E+05	Other
NETHERLAND	LLW, ILW, HLW (depending on enrichment)			U, Pu, Under research	enrichment> 5%-100% = 0,18 m3	5,30E+01	Other (GDF)	
11	Reactive metals	DENMARK	No national classification scheme	N.A.	Charcterisation in progress	Not compiled	Not available	Other (DGR)
		NETHERLAND	LILW		under research	NA	NA	Other (GDF)
12	Chemotoxic Material	DENMARK	No national classification scheme	N.A.	Charcterisation in progress	Not compiled	Not available	Other (DGR)
		ITALY	VLLW/LLW	5,32E+08	Ni63, Co60, Cs137, Sr90	5,10E+01	1,52E+04	Near Surface
		NORWAY	LLW	N.A.	N.A.	N.A.	N.A.	Near Surface
		GREECE	VLLW/ LLW/ ILW ?	3e12 long lived, 4,5E13 short lived and 6E14 H-3	Fe-55, Ni-63, Co-60, Mn-54, H-3, Be-10, Ni-59, Ag110m, Ag108m, Cd109	6,80E-01	6,57E+03	Near surface/Other (possibly multi-purposes borehole)
		NETHERLAND	HLW		under research	small		Other (GDF)
13	Liquid waste	CROATIA	LLW	N.A.	Co60, Cs137, Eu152	N.A.	4,80E+02	Near Surface
		ITALY	LLW/ILW	1,89E+12	C14, H3, Cs137, Eu154, Ni63, Pu238, Pu239, Pu240, Pu241, Am241, U235m	2,75E+00	1,12E+03	Near Surface/Other
		NORWAY	LLW/ILW	N.A.	Uranium, actinides (Am241, Pu239, Pu240, Pu241), activation and fission products Cs-137, Sr 90, Co60, etc. ?	N.A.	N.A.	Near Surface