



**CONDITIONS FOR ACCEPTANCE
BY
LLW REPOSITORY LIMITED

OF RADIOACTIVE WASTE

FOR DISPOSAL AT

THE LOW LEVEL WASTE REPOSITORY

(CFA)**

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History Sheet

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- Low Level Waste Service Manger Role replaces Commercial Manager role
- Introduction – Reference to new segregated waste services included
- A6 – Revised to include reference to requirements for segregating waste
- A15 – Allowance for increased putrescible waste content in Combustible and Very Low Level Waste
- A17 – Radioactivity limits included for Very Low Level Waste
- Section IV – New section detailing Metallic Waste service
- Section V – New section detailing Combustible Waste service
- Section VI – New section detailing Very Low Level Waste service
- Part A, Appendix 3 – Acceptable Containers table updated to include new transport containers for segregated waste services
- Part A, Appendix 7 / Appendix 9 – Revised to allow polythene bag to be used as outer package for HEPA filters to support retention of labels
- Glossary – Updated to include definitions relating to segregated waste services



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INTRODUCTION

1. These Conditions for Acceptance (CFA) represent the requirements for Receipt and Disposal of radioactive waste at the Low Level Waste Repository (LLWR). The Conditions are in two parts: Part A being the "Specification" for the waste and Part B being the "Procedures" associated with the Receipt and Acceptance of the waste.
2. A companion Guidance Note (GN01) may be obtained from our website: www.llwrsite.com, or on request from the Low Level Waste Service Manager, LLW Repository Ltd, Low Level Waste Repository, Holmrook, Cumbria, CA19 1XH. The Guidance Note supports the CFA by explaining the basis of condition requirements, providing additional information and giving examples of ways of meeting the conditions.
3. The system for receiving agreement to consign specific amounts and types of radioactivity is integrated within the standard LLW Repository Limited Agreement for the Disposal of Low Level Radioactive Waste.
4. The services offered are detailed in Part A: Sections II, III, IV, V and VI of these Conditions for Acceptance. These sections also specify the acceptable wasteforms for Delivery. Services offered are:
 - High Force Compaction, Grouting and Disposal (Section II)
 - Grouting and Disposal (Section III)
 - Metallic Waste (Section IV)
 - Combustible Waste (Section V)
 - Very Low Level Waste Disposal Service (Section VI)
5. The services described in Sections IV, V and VI are offered on the basis that LLW Repository Ltd may opt to take further action with segregated material such that the final volume for disposal at the Low Level Waste Repository is minimised.



PART A: SPECIFICATION FOR ACCEPTANCE

For receipts of solid low level radioactive waste (LLW), the waste shall comply with both the Common Specification (Section I) and the section (i.e. II to VI) of this specification covering the particular service being supplied by LLW Repository Ltd.

SECTION I: COMMON SPECIFICATION

GENERAL

- A1. No radioactive waste will be accepted for disposal at the LLWR unless it meets this specification. Waiver or alteration of any part of the specification is only permitted with the prior written consent of the LLW Repository Ltd. The appropriate routing is by submission of a Form D5 with supporting justification (for example a Best Practicable Means (BPM) and/or Best Practicable Environment Option (BPEO) assessment) to the Low Level Waste Service Manager, LLW Repository Ltd, Low Level Waste Repository, Holmrook, Cumbria, CA19 1XH. It should be noted that agreement is required prior to waste being prepared for consignment.
- A2. The only waste that will be accepted for disposal at the LLWR is solid radioactive waste compliant with the LLWR Certificate of Authorisation BZ2508. Waste must meet activity, chemical and physical requirements and have been treated or packaged in such a way as to render it, so far as is reasonably practicable, insoluble in water and not readily flammable.
- A3. When customers are consigning Third Party Wastes, these wastes and the organisation that generates the waste shall be specifically identified in the associated documentation required by this CFA.
- A4. Only waste covered by a current certificate or letter of authorisation issued by the appropriate government department will be accepted. The customer shall also have in place arrangements for the return to the customer of any non-compliant Consignment, or part thereof, delivered to LLW Repository Ltd for disposal at the LLWR. Waste shall also be covered by an activity allocation obtained from the Low Level Waste Service Manager. These activity allocations are given on a calendar year basis and cover the individual radionuclides and radionuclide groupings listed in paragraph A17.
- A5. Only waste which meets both the overall Wastestream and individual Consignment requirements of this CFA will be accepted. A Consignment may contain LLW from a number of Wastestreams.



MATERIALS TO BE SEGREGATED, EXCLUDED OR PREPARED AND MADE SAFE

- A6. Waste should not be Consigned for disposal if reasonably practicable measures could be adopted to segregate its constituent parts such that LLW Repository Ltd could subsequently use waste treatment processes or alternative 'fit for purpose' disposal routes to reduce the final volume requiring disposal at the LLW Repository site. The following waste segregation principles must be applied:
- a) Compactable Non-Combustible Material should be segregated and consigned according to the requirements of Section II. LLW Repository Ltd will facilitate the subsequent supercompaction of this material and dispose of the resulting compacted wastes.
 - b) Uncompactable Material which is unsuitable for consignment by any of the means described in paragraph A6 a), c), d) or e) should be segregated and consigned for direct grouting and disposal according to the requirements of Section III.
 - c) Metallic Material can be segregated and consigned according to the requirements of Section IV. Where appropriate, LLW Repository Ltd will undertake the subsequent treatment of this material and dispose of the resulting secondary wastes. Metallic material which does not meet the requirements of Section IV should be segregated and consigned according to the requirements of Section III.
 - d) Combustible Material can be segregated and consigned according to the requirements of Section V. Where appropriate, LLW Repository Ltd will undertake the subsequent treatment of this material and dispose of the resulting secondary wastes. Compactable combustible material which does not meet the requirements of Section V should be segregated and consigned according to the requirements of Section II.
 - e) Material with activity levels consistent with the definition herein of Very Low Level Waste can be segregated and consigned according to the requirements of Section VI. Where appropriate, LLW Repository Ltd will undertake the subsequent disposal of this material at suitable alternative sites (see "DEFRA Policy for the Long Term Management of Solid Low Level Radioactive Waste in the UK ", 2007, The Stationery Office and subsequent updates).
- A7. A Wastestream for disposal at the LLWR must consist of waste deemed to be contaminated and not the primary contaminant. Furthermore the Radioactive contaminant averaged over the lifetime of the wastestream should not exceed 10% of the total wastestream by weight. However,



consideration will be made on a case-by-case basis to wastestreams exceeding this value based on the submission of BPM/BPEO studies.

- A8. Wastestreams are accepted for disposal at the LLWR based on the availability of sufficient volumetric and radiological capacity.
- A9. The liquid content of the waste must comply with the service specific requirements detailed in paragraphs A30 and A34.

Non-radiological waste component acceptance criteria

- A10. Where materials are added to the waste, then the Customer shall use reasonable efforts to limit the quantity of non-waste materials present in a Consignment. In particular, it is not acceptable to purposely dilute waste or add shielding materials for the sole purpose of achieving compliance with this specification.

Materials that shall be excluded or prepared and made safe

- A11. a) Materials that are likely to, or actually, possess the following risks or associated categories of danger shall be assessed and where present excluded from the waste or made safe prior to any conditioning or mixing with other materials. For the material to be made safe the hazards or risks shall be removed or reduced to such a level that individual Consignments no longer possess that hazard or risk. Where methods are employed to make the waste safe, the details of such methods shall be approved in advance by LLW Repository Ltd by the Form D5 route (see paragraph A1). Those risks and associated categories of danger referred to above are as defined in The Chemicals (Hazard Information and Packaging for Supply) Regulations 2005 (*CHIP3.1*) or as amended by subsequent regulations.
- b) Waste shall not contain, or be capable of generating, any toxic gases, vapours, or fumes harmful to persons, or causing an explosive hazard, during normal operations for transporting, handling, grouting or disposing of the waste.

Grouting of the waste by LLW Repository Ltd consists of adding a water based alkaline grout. Aluminium, zinc and magnesium can potentially react with the grout but need only be considered if their totalled accessible surface area in a Consignment is greater than 10m². Quantities of such materials in a Consignment with higher surface areas, or of other potentially reactive metals, shall be assessed by the customer on a case-by-case basis and this assessment included in the Wastestream Characterisation Document (WSCD). Further details of grout properties can if necessary be provided by LLW Repository Ltd.



Articles that shall be excluded or prepared and made safe

- A12. The following articles shall be excluded unless treated, prepared or made safe by a method approved in advance by LLW Repository Ltd by the Form D5 route (see paragraph A1):

Pressurised gas receptacles and aerosols as defined within The Carriage of Dangerous Goods (Classification, Packaging and Labelling) and Use of Transportable Pressure Receptacles Regulations 2004 (or as amended)

Materials that shall be excluded or stabilised

- A13. The following materials shall be excluded unless treated, prepared or stabilised by a method approved in advance by LLW Repository Ltd by the Form D5 route (see paragraph A1):

a) Ion Exchange Materials

b) Complexing Agents

Infectious and pathogenic materials that shall be excluded

- A14. Waste containing biological, pathogenic or infectious materials listed within Hazard Groups 2, 3 or 4 produced by The Advisory Committee on Dangerous Pathogens (UK - HSC) shall be excluded from the waste or treated so that there exists no viable micro-organism(s) from Hazard Groups 2, 3 or 4. Any method employed to treat the waste shall be approved in advance by LLW Repository Ltd by the Form D5 route (see paragraph A1).

Materials that shall be restricted

- A15. Waste containing putrescible materials (materials liable to be readily decomposed by micro-organisms, excluding wood and paper) shall as far as reasonably practicable be excluded and in any event shall not exceed 1% by weight of the Waste and Primary Containment Weight. Putrescible material segregated for consignment as Combustible or Very Low Level Waste (as detailed in Sections V and VI) may exceed this limit, subject to approval in advance by LLW Repository Ltd by the Form D5 route (see paragraph A1).

Further non-radiological requirements

- A16. a) For each Wastestream quantitative details shall be provided in the WSCD of all non-radiological substances or preparations that possess any one or more of the hazard properties H1 through H14 inclusive as defined within Part A, Appendix 1.



- b) The Hazardous Waste Regulations (2005) apply to a limited amount of radioactive waste. Most radioactive waste is subject to the provisions of the Radioactive Substances Act 1993 (RSA 93) and is outside the scope of the Hazardous Waste Regulations. However, to fulfil regulatory expectations Hazardous Waste shall continue to require approval in advance by LLW Repository Ltd by the Form D5 route (see paragraph A1). It is recognised that not all types of Hazardous Waste are relevant to LLWR operations, therefore customers are encouraged to consult with LLW Repository Ltd prior to the preparation of the Form D5. The resultant document can be in the form of a “generic” Form D5 (for the contract period) or on an as needed basis to meet the customer’s requirements. This shall include details of the components that make the waste hazardous and the levels at which they are present. (See Appendices 4 & 5 for Lead and Asbestos specific guidance). Consignment specific notification of Hazardous Waste is recorded in the relevant section of the Form D4.
- c) In addition, for each Wastestream quantitative details shall be provided in the WSCD of those non-radiological substances or preparations that are contained within List I or List II of The Groundwater Regulations 1998 (or as amended by subsequent regulations) where the waste comes from a process where the List I or List II material content of the waste has been processed or concentrated. List I and II are as defined in Part A, Appendix 2.

RADIOACTIVITY LIMITS

- A17. a) The activity of any Consignment of solid waste for disposal as low level waste at the Low Level Waste Repository shall not exceed the following values:

	<u>GBq/te</u>
i) All alpha-emitting nuclides	4
ii) All other radionuclides not included in (i) above	12



b) The specific activity content of a Wastestream over the lifetime of the Wastestream shall not exceed the following values:

- | | |
|-------------------------------------------------------|---------------|
| | <u>GBq/te</u> |
| i) All alpha-emitting nuclides | 4 |
| ii) All other radionuclides not included in (i) above | 12 |

c) Waste consigned as Very Low Level Waste (in accordance with section VI) shall not exceed the following values:

- | | |
|----------------------|---------------|
| | <u>MBq/te</u> |
| i) All radionuclides | 4 |
| ii) H3 (Tritium) | 40 |

d) The Wastestream total activity content and specific activity shall not exceed both trigger levels for any of the following radionuclide groupings unless approved in advance by LLW Repository Ltd by the Form D5 route (see paragraph A1):

ACTIVITY GROUP	TOTAL ACTIVITY TRIGGER (GBq)	SPECIFIC ACTIVITY TRIGGER (GBq/te)
Uranium	90	0.09
Ra226 & Th232	9	0.009
Other Alpha	90	0.09
Carbon-14	15	0.015
Iodine-129	15	0.015
Tritium	3,000	3.0
Cobalt-60	600	0.6
Others ¹	4,500	4.5

¹ Others also includes the Cobalt-60 content of the Wastestream

In accounting for radioactivity against these Consignment and Wastestream limits, the activity of Short Half-Life decay products with half-lives of less than three months shall not be accounted if they are present in amounts not exceeding those which could be present through decay of accounted nuclides.

A18. External non-fixed contamination levels on Transport Containers and Disposal Containers at the time of despatch shall be as low as reasonably practicable and in any case not more than 4 Bq/cm² beta/gamma and 0.4 Bq/cm² alpha averaged over an area of 300 cm² (or the area of the surface if less than 300 cm²). External dose rates shall be as low as reasonably practicable and limited in accordance with current transport regulations. Any proposed delivery where the container does not, in its own right, comply with the requirements of the current transport regulations and requires additional shielding to ensure compliance, must be approved in advance by LLW Repository Ltd by the Form D5 route (see paragraph A1).



This is in addition to the consignor meeting any requirements under the current transport regulations.

FISSILE CONTENT LIMITS (CRITICALITY CONTROL)

A19. Waste containing isotopes needing criticality control* shall not be Consigned unless LLW Repository Ltd has been notified in advance and has agreed to the disposal by the Form D5 route (see paragraph A1). The LLWR Criticality Safety Case considers the potential impact of significant quantities of graphite in proximity to fissile material. Consequently any consignment containing five tonnes or more of graphite shall always be subject to prior written notice and agreement by the Form D5 route (see paragraph A1).

* Isotopes requiring criticality control are:

Th228	Np237	Pa231	Cm243	Cf249
U232	Pu238	Pa232	Cm244	Cf250
U233	Pu239	Am241	Cm245	Cf251
U234	Pu240	Am242m	Cm246	Cf252
U235	Pu241	Am243	Cm247	Es254
U236	Pu242			

The exceptions to this requirement are set out in paragraphs A20 to A24. Note: there is no exception for waste containing Cm247; it shall always be subject to prior written notice and agreement by the Form D5 route (see paragraph A1). Characterisation of waste for fissile radionuclides shall seek to establish maximum values of relevant isotopes.

A20. Waste containing U235 may be consigned provided that:

- a) all the uranium present has a U235 enrichment less than natural level, i.e. is depleted; or
- b) the U235 content of any Consignment does not exceed 60g.

A21. Waste containing isotopes of plutonium may be consigned provided that the Consignment contains:

- a) not more than 0.1GBq/te in total of Pu238, Pu239, Pu240 and Pu242 and
- b) not more than 12GBq/te of Pu241 (the limit for radioactive content).

A22. Waste containing Np237 may be consigned provided that the Consignment contains not more than 4GBq/te of Np237 (the limit for radioactive content).



A23. Waste containing isotopes of americium may be consigned provided that the Consignment contains not more than 0.1GBq/te of each of these radionuclides.

A24. Waste containing any of the following radionuclides may be Consigned provided that the Consignment contains not more than the stated MBq/te values of each of these radionuclides:

Nuclide	Limit	Nuclide	Limit	Nuclide	Limit	Nuclide	Limit
Th228	100	U236**	0.0001	Cm244	100	Cf250	10
U232**	1	Pa231	0.1	Cm245	1	Cf251	1
U233**	1	Pa232	100	Cm246	1	Cf252	1
U234**	0.01	Cm243	100	Cf249	1	Es254	10

** Criticality control is applied only where artificial means have been employed to enrich the uranium specifically in these isotopes (i.e. products of U235 enrichment processes are covered by paragraph A20).

PACKAGING

A25. The Transport Container or Disposal Container shall not be left un-vented for more than thirty days in advance of the anticipated Delivery date at WAMAC/LLWR.



SECTION II: HIGH FORCE COMPACTION, GROUTING AND DISPOSAL SERVICE

A26. Waste for High Force Compaction (HFC) shall be Compactable Wastes which means those wastes for which best practicable means are sufficient to render them into a form suitable for HFC and which if subject to HFC and allowing for Reassertion could reasonably be expected to be reduced in volume by 30% or more. Suitable forms for HFC are nominal 200 litre drums or Other Containers as defined below.

Compactable wasteforms that will be accepted for Delivery to WAMAC will include:

- a) 200 litre (nominal) mild steel drums in accordance with the following:
 - (i) Maximum external drum diameter with the lid clamp fitted and tightened will be in the range 592 to 615mm;
 - (ii) Maximum drum height of 886mm;
 - (iii) Drum rolling rings shall not be positioned at 400 ± 50 mm or 660 ± 50 mm from the base of the drum;
 - (iv) Lid clamping - all drum lids shall be clamped in such a way that the closure makes contact with the drum wall and completely cover the drum rim. The closure shall be the bolt type (not the lever type closure mechanism) and shall be such that the bolt has been firmly tightened and not reached its limit of travel when the drum is Consigned for High Force Compaction (no free movement of the lid and clamp by hand shall be possible);
 - (v) Drum walls shall be at least 1mm thick;
 - (vi) Drums shall be in good condition and fit for purpose;
 - (vii) The drum weight (drum and contents) shall not exceed 0.3t on delivery.
- b) Loose bagged or wrapped waste consigned in a reusable transport skip shall be loaded and delivered in accordance with Part A, Appendix 7.
- c) Drums containing only re-assertable waste shall be loaded and delivered in accordance with Part A, Appendix 8.
- d) Undrummed compactable filter waste consigned in a Transport Container shall be loaded and delivered in accordance with Part A, Appendix 9.



- e) Other containers that deviate from the standard drum specification shall be subject to advance approval for the contract period or remainder of the contract period, (as required by the customer) by LLW Repository Ltd using the Form D5 (see paragraph A1).

A27. In respect of drum consignments delivered in Transport containers:
(For "Loose" Drum consignments see Appendix 6 for specific guidance).

- a) Waste in drums shall be delivered in Transport Containers as listed in Part A, Appendix 3 Section II in compliance with current Transport Regulations.
- b) The drums shall be placed so that they can be readily retrieved by routine mechanical handling equipment without damage and loss of containment.
- c) Drums shall be as free as reasonably practicable from non-fixed contamination and in any event such contamination shall not be greater than 4 Bq/cm^2 beta/gamma and 0.4 Bq/cm^2 alpha averaged over an area of 300cm^2 (or the area of the surface if less than 300cm^2).
- d) The potential for dust generation during any retrieval shall be minimised by suitable controls during filling operations.

A28 **[Paragraph intentionally left blank (superseded by Paragraph B16)]**

A29. Individual packages in the Transport Container e.g. drums in a Transport Container, bags and wrapped items in a skip, shall be labelled in such a way as to provide traceability back to the point of generation. Details of the individual packages shall be retained by the customer for a period of not less than two years from Delivery and not supplied with the Consignment documentation. Individual drums shall carry a unique identifier of the format NNNNNN/AAAAA where NNNNNN is a unique sequential package number provided by each consigning establishment and AAAAA is a unique consignor code for each consigning establishment (available from the Low Level Waste Service Manager). Drums shall have the unique identifier clearly displayed on the drum lid with a minimum character height of 24mm.

- A30. a) No free liquor shall be present in the waste and in all instances shall not release more than 1% by volume of liquid during HFC. In addition the non-aqueous content of any liquid in the waste shall be treated so that the volume that will be released during HFC does not exceed 0.05% of the volume of the waste.
- b) Waste capable of generating powder or dust shall be contained in a breathable polycotton sack such that air can escape through the fabric but the powder or dust is retained during HFC.



- c) The use of Impermeable Drum Liners shall be avoided where possible, but where deemed necessary by the customer to be used, the clearance between the liner and drum wall shall not exceed 20mm. If used, this should be identified in the WSCD.
- d) Sharp objects and glass shall be contained within secondary packaging or containment within a drum such that they could reasonably be expected, based on previous performance, to remain contained during routine mechanical handling of the drum and in the event of a drum rupture during HFC.
- e) Heavy gauge steelwork, and other items which could reasonably be expected to offer a significant and/or non-uniform axial resistance during HFC, is deemed Uncompactable Waste and therefore unsuitable to be Consigned to WAMAC.
- f) Waste containing Th232 in excess of 1 MBq/t, shall not be consigned for HFC unless details are cleared in advance with LLW Repository Ltd by submission of a Form D5 for approval.
- g) The consignment of compactable asbestos waste to the WAMAC facility for HFC is not permitted with no exceptions.

A31. **[Paragraph intentionally left blank]**



SECTION III: GROUTING AND DISPOSAL SERVICE

- A32. Best practicable means shall be used to compact solid waste for disposal at the LLWR. Waste for grouting in approved containers shall be either High Force Compacted or be regarded as Uncompactable Waste.
- A33. a) Waste for grouting shall be in Disposal Containers as listed in Part A Appendix 3 Section III. Waste that cannot be readily consigned in approved waste containers may be acceptable for disposal as uncontainerised items or in other containers as approved. Such disposal methods will require justification, (for example by BPM and/or BPEO assessment), and will require prior LLW Repository Ltd approval using the Form D5.
- b) Each Disposal Container or non-containerised item shall be uniquely marked or labelled so as to be legible for at least five years such that the Customer can be identified, together with a Consignment serial number.
- c) Inaccessible Voidage within the Disposal Container shall be minimised as far as reasonably practicable and in any event shall not exceed 10% of the internal Disposal Container capacity, excluding voidage within High Force Compacted drums or WAMAC boxes. As far as reasonably practicable, any Inaccessible Voidage shall be uniformly distributed within the Disposal Container.
- d) As far as reasonably practicable, waste should be packaged in such a way as to maximise the use of the Disposal Container, whilst ensuring sufficient grout penetration can still be attained.
- e) As far as reasonably practicable, photographic evidence of Consignment container stage filling should be produced and retained by the customer.
- A34. **Liquids**
- a) No Free Liquor shall be present in the waste.
- b) Any aqueous and/or non-aqueous liquid waste shall be fixed in a solid matrix (e.g. cement) which will not result in release of liquid under applied loads of up to 400kN/m².
- c) The non-aqueous content of any liquid in the waste shall be treated so that no visible oil or grease will be released by leaching of an Uncompactable Wasteform.



- d) Where this conditioning route is used to render non-aqueous liquids or materials into a form that will be accepted for disposal, the details shall be cleared in advance with LLW Repository Ltd by the Form D5 route and must include justification, (for example by BPM and/or BPEO assessment). -see paragraph A1).

Soluble Solids

Any discreet bulk (>1kg) chemical compound solid wastes that are described as soluble or slightly soluble in cold water (inorganic compounds) and water (organic compounds) in the solubility column of the CRC Handbook of Chemistry and Physics (88th edition or as amended) are applicable wastes.

- e) No soluble/slightly soluble bulk solid wastes shall be disposed of in an unconditioned way.
- f) Any soluble/slightly soluble bulk solid waste shall be fixed in a solid matrix (e.g. cement), which will not readily release that component under test.
- g) Where this conditioning route is used to render solid wastes into a form that will be accepted for disposal, the details shall be cleared in advance with LLW Repository Ltd by the Form D5 route (see paragraph A1).
- A35. Customers are responsible for loading the Disposal Container so that when the accessible voidage is in-filled with a grout of nominal density 1.8 t/m^3 , the gross weight of the Disposal Container does not exceed the weight limit in Part A Appendix 3 Section III, or the load applied by the base of the Disposal Container/Item does not exceed $30 \text{ kN/m}^2/\text{m}$ of Disposal Container/Item height, whichever is the more restrictive.



SECTION IV: METALLIC WASTE

A36. Reasonable means shall be used to segregate metallic waste from other non metallic wastes and furthermore sort and physically segregate the metallic waste into the following categories:

- a) Stainless steel
- b) Carbon Steel
- c) Aluminium
- d) Brass
- e) Copper
- f) Lead

Individual consignments of mixed metallic waste, or alloys not identified above, may be acceptable, subject to approval in advance by LLW Repository Ltd by the Form D5 route (see paragraph A1).

A37. The following materials must not be present in segregated metallic waste:

- a) Non metallic items such as rubber, plastic or nylon
- b) Free liquids of any composition
- c) Mercury or compounds of Mercury
- d) Reactive metals
- e) Organic material (including oil and grease and organic coatings such as paint or vulcanised layers).
- f) Sealed compartments, aerosol cans or other sealed containers and confined geometries which may cause explosion or self ignition.

A38. Items present in segregated metallic waste shall meet the following dose criteria:

- a) Dose Rate at contact <0.2 MilliSieverts/hr (maximum)
- b) Dose Rate at 1 metre <0.1 MilliSieverts/hr (maximum)

Materials with higher dose rates may be acceptable, subject to approval in advance by LLW Repository Ltd by the Form D5 route (see paragraph A1).

A39. Best practicable means shall be used to ensure that metallic waste conforms with the following dimensions:

- a) Aluminium, Brass, Copper and Steel:
 - Maximum diameter/width: 550mm
 - Maximum length: 1,200mm



b) Lead:

- Maximum diameter/width: 400mm
- Maximum length: 550mm

Metallic waste with dimensions outside these limits may be acceptable, subject to approval in advance by LLW Repository Ltd by the Form D5 route (see paragraph A1).

- A40. Metallic waste consignments containing electrical cables and wire rope may be acceptable, subject to approval in advance by LLW Repository Ltd by the Form D5 route (see paragraph A1).
- A41. Consignment of segregated waste under the requirements of this section shall be limited to the volume and activity allocation agreed in advance between the consignor and LLW Repository Ltd
- A42. **[Paragraph intentionally left blank]**



SECTION V: COMBUSTIBLE WASTE

- A43. Reasonable means shall be used to segregate combustible waste from other non combustible wastes.
- A44. The following materials must not be present in segregated combustible waste:
- a) Sealed compartments, aerosol cans or other sealed containers and confined geometries which may cause explosion or self ignition
 - b) Asbestos or asbestos contaminated material
 - c) Objects with exposed sharp edges
 - d) Substances or preparations that possess any one or more of the hazard properties H4 through H14 inclusive as defined within Part A Appendix 1
 - e) Electrical cable
 - f) Resins
 - g) Silicon rubber
- A45. Waste containing Poly Vinyl Chloride (PVC) and rubber may be acceptable, subject to approval in advance by LLW Repository Ltd by the Form D5 route (see paragraph A1).
- A46. Individual bags / boxes of segregated combustible waste shall meet the following Surface Dose Rate criteria:
- a) No less than 95% of the total quantity of boxes/bags shall be <100 MicroSieverts/hr
 - b) No more than 5% of the total quantity of boxes/bags shall be between 100 and 1000 MicroSieverts/hr
 - c) No individual bag/box shall be >1000 MicroSieverts/hr
- A47. Pre-compacted combustible waste may be acceptable, subject to approval in advance by LLW Repository Ltd by the Form D5 route (see paragraph A1).
- A48. Best practicable means shall be used to ensure that combustible waste conforms with the following requirements:
- a) Combustible waste shall be packed into transparent polythene bags with a thickness \geq to 0.1mm
 - b) Individual packages of combustible waste shall have a maximum weight of 25kg
 - c) Individual packages of combustible waste shall be no larger than 600x500x400mm



Combustible waste which does not meet these requirements may be acceptable, subject to approval in advance by LLW Repository Ltd by the Form D5 route (see paragraph A1).

A49. Combustible waste containing free liquids may be acceptable, subject to approval in advance by LLW Repository Ltd by the Form D5 route (see paragraph A1).

A50. Consignment of segregated waste under the requirements of this section shall be limited to the volume and activity allocation agreed in advance between the consignor and LLW Repository Ltd

A51. **[Paragraph intentionally left blank]**



SECTION VI: VERY LOW LEVEL WASTE (VLLW)

- A52. Reasonable means shall be used to segregate waste which falls into the VLLW category from LLW.
- A53. The following materials must not be present in segregated VLLW:
- a) Free liquids of any composition
 - b) Substances or preparations that possess any one or more of the hazard properties H1 through H14 inclusive as defined within Part A Appendix 1.
 - c) Metallic waste (including steel reinforcing bar)
- A54. The concentration of radioactivity in segregated VLLW shall not exceed 4MBq/te for all isotopes, with the exception of H3 (Tritium) for which the concentration limit is 40MBq/te
- A55. Consignment of segregated waste under the requirements of this section shall be limited to the volume and activity allocation agreed in advance between the consignor and LLW Repository Ltd
- A56. **[Paragraph intentionally left blank]**



PART A, APPENDIX 1: HAZARD PROPERTIES (see paragraph A16a)

- H1 Explosive:** substances and preparations which may explode under the effect of flame or which are more sensitive to shocks or friction than dinitrobenzene.
- H2 Oxidising:** substances and preparations, which exhibit highly exothermic reactions when in contact with other substances, particularly flammable substances.
- H3-A Highly flammable:**
- liquid substances and preparations having a flash point below 21°C (including extremely flammable liquids), or
 - substances and preparations which may become hot and finally catch fire in contact with air at ambient temperature without any application of energy, or
 - solid substances and preparations which may readily catch fire after brief contact with a source of ignition and which continue to burn or to be consumed after removal of the ignition source, or
 - gaseous substance and preparations which are flammable in air at normal temperature and pressure, or
 - substances and preparations, which in contact with water or damp air evolve highly flammable gases in dangerous quantities.
- H3-B Flammable:** liquid substances and preparations having a flash point equal to or greater than 21°C and less than or equal to 55°C.
- H4 Irritant:** non-corrosive substances and preparations, which, through immediate, prolonged or repeated contact with the skin or mucous membrane, can cause inflammation.
- H5 Harmful:** substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may involve limited health risks.
- H6 Toxic:** substances and preparations (including very toxic substances and preparations) which, if they are inhaled or ingested or if they penetrate the skin, may involve serious, acute or chronic health risks and even death.
- H7 Carcinogenic:** substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may induce cancer or increase its incidence.



- H8** **Corrosive:** substances and preparations, which may destroy living tissue on contact.
- H9** **Infectious:** substances containing viable microorganisms or their toxins, which are known or reliably believed to cause disease in man or other living organisms.
- H10** **Teratogenic:** substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may induce non-hereditary congenital malformations or increase their incidence.
- H11** **Mutagenic:** substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may induce hereditary genetic defects or increase their incidence.
- H12** Substances and preparations, which release toxic or very toxic gases in contact with water, air or an acid.
- H13** Substances and preparations capable by any means, after disposal, of yielding another substance, e.g. a leachate, which possesses any characteristics listed above.
- H14** **Ecotoxic:** substances and preparations, which present or may present immediate or delayed risks for one or more sectors of the environment.



PART A, APPENDIX 2: SUBSTANCES WHICH HAVE OR COULD HAVE A HARMFUL EFFECT ON GROUNDWATER (see paragraph A16c)

List I - These substances should be prevented from being discharged into groundwater:

- a) Organohalogen compounds and substances which may form such compounds in the aquatic environment
- b) Organophosphorus compounds
- c) Organotin compounds
- d) Substances which possess carcinogenic, mutagenic or teratogenic properties in or via the aquatic environment
- e) Mercury and its compounds
- f) Cadmium and its compounds
- g) Mineral oils and hydrocarbons
- h) Cyanides

List II – These substances should have their discharges into groundwater minimised:

- a) The following metalloids and metals and their compounds:
 - 1) Zinc
 - 2) Copper
 - 3) Nickel
 - 4) Chromium
 - 5) Lead
 - 6) Selenium
 - 7) Arsenic
 - 8) Antimony
 - 9) Molybdenum
 - 10) Titanium
 - 11) Tin
 - 12) Barium
 - 13) Beryllium
 - 14) Boron
 - 15) Uranium
 - 16) Vanadium



- 17) Cobalt
 - 18) Thallium
 - 19) Tellurium
 - 20) Silver
- b) Biocides and their derivatives not appearing in List 1
 - c) Substances which have a deleterious effect on the taste and/or odour of groundwater and compounds liable to cause the formation of such substances in such water and to render it unfit for human consumption
 - d) Toxic or persistent organic compounds of silicon and substances which may cause the formation of such compounds in water, excluding those which are biologically harmless or are rapidly converted in water into harmless substances
 - e) Inorganic compounds of phosphorus and elemental phosphorus
 - f) Fluorides
 - g) Ammonia and nitrites

For complete details see Groundwater Regulations 1998 or as amended. Also individual substances under List I and II from within the families or groups of substances given in the Regulations have been determined and are available on the Environment Agency website.



PART A, APPENDIX 3: ACCEPTABLE CONTAINERS (see paragraph A33a)

- The following standard containers are accepted for the purposes as detailed in the respective Sections of Part A.

Container Type	Design Number	Column A (Tonne)	Column B (Tonne)	Column C (m ³)
Section II – Transport Containers for High Force Compaction, Grouting and Disposal Service				
Full Height Transport Container	2912	20	N/A	N/A
Full Height Transport Container	2031	20	N/A	N/A
Full Height Transport Container	2033	20	N/A	N/A
Full Height Transport Container	2044	25	N/A	N/A
Full Height Transport Container	NC02/2005	24	N/A	N/A
ISO Skip Transport Container	0075	17	N/A	8.5
Section III – Containers for Grouting and Disposal Service				
1/3 Height Disposal Container	2989	35	40	13.0
1/2 Height Disposal Container	2910B	35	42	19.5
1/2 Height Disposal Container	2910C	35	42	19.5
2/3 Height Disposal Container	2968	40	42	26.8
3/4 Height Disposal Container	3550	35	42	29.7
1/3 Height Fissile Disposal Container	3563	35	40	13.0
1/2 Height Fissile Disposal Container	3564	35	42	19.5
WAMAC Disposal Container	2947B	35	40	20.0
WAMAC Disposal Container	2947C	35	40	20.0
ISO Skip Disposal Container	2921B	17	22	11.4
Sections IV / V / VI – Containers for Metallic Waste / Combustible Waste / Very Low Level Waste Services				
1/3 Height Disposal Container	2989	35	N/A	13.0
1/2 Height Disposal Container	2910C	35	N/A	19.5

Column A: shows the maximum gross weight (MGW) for compliance with the transport regulations for each container design. The MGW for any individual container is recorded in the Container Safety Convention (CSC) approval plate on each container and shall be checked before the container is filled with waste.

Column B: shows the MGW of the container after in-fill grouting that can be routinely handled at LLWR.



Column C: shows the Gross Envelope Volume of each Disposal Container design for the purposes of calculating treatment, grouting and disposal charges.

2. Other container designs with limited/specific applications may be accepted by LLW Repository Ltd subject to prior approval via the Form D5 procedure.



PART A, APPENDIX 4: DISPOSAL OF LEAD (Pb)

1. Lead waste to be disposed, as LLW shall be notified in advance to LLW Repository Ltd using Form D5.
2. The Form D5 submission should include the following information:
 - Surface Area (in m²) for the period, this is to include readily available surface area and inaccessible areas (such as Lead encased in steel or cement etc).
 - Total Volume (in m³), for the period.
 - Waste routing should be stated.
3. Form D5 approvals for Lead disposal will be valid for the financial year.
4. Consignment specific data for the Lead (i.e. surface area and mass) should be entered into the relevant Form D4 section.
5. On consignment completion the customer must inform LLW Repository Ltd in line with D5 agreement of actual lead consigned (weight and surface area)



PART A, APPENDIX 5: DISPOSAL OF ASBESTOS

1. Asbestos waste to be disposed as LLW shall be notified in advance to LLW Repository Ltd using Form D5 for the contract period. The Form D5 must specify the weight and volume of asbestos to be disposed of.
2. Consignment specific data for the Asbestos should be entered into the relevant Form D4 notification section.
3. All items are to be double PVC wrapped ensuring inaccessible voidage criteria is met at all times.
4. Excess air that may be trapped within the bags or wrappings must be minimised.
5. All Asbestos waste must be consigned with uncompactable wastes and restrained as such to prevent floatation of the waste during the grouting process



PART A, APPENDIX 6: DISPOSAL OF “LOOSE” DRUMS.

Loose Drums containing compactable waste

1. Loose drums containing compactable waste shall comply with following delivery requirements:
 - a) The drums must be secured to plastic pallets in a vertical orientation (i.e. drum lids uppermost).
 - b) Pallets shall be fit for purpose and shall not distort during routine handling due to the weight of the loaded drums. Wooden pallets are unacceptable.
 - c) No more than one drum per pallet (dependent on pallet suitability and overall weight).
 - d) The drums must be fit for purpose and free of any external debris.
 - e) The drum pallets must be retrievable from the delivery vehicle by mechanical means ONLY. i.e. a forklift truck (FLT). (Note: WAMAC FLT has a blade width of 127mm, blade centres 711mm minimum).
 - f) Single drums which exceed the 0.3 tonne limit must be clearly identified on the consignment form D4.

Loose Drums containing uncompactable waste

2. All loose drums containing uncompactable waste shall be approved in advance by LLW Repository Ltd using the Form D5.
3. Loose drums containing uncompactable waste must comply with the delivery requirements outlined in Item 1 above and in addition, be clearly marked as ‘uncompactable’ on individual drum sides using letters greater than 25 millimetres in height.



**PART A, APPENDIX 7: ADDITIONAL SPECIFICATION FOR THE
CONSIGNMENT OF LOOSE COMPACTABLE WASTE IN A TYPE 0075
REUSEABLE TRANSPORT CONTAINER**

- 1.1. Supplement to paragraphs A26 – A31 “Section II : High Force Compaction, Grouting and Disposal service”
- 1.2. The correct waste streaming at source by the customer greatly improves the operating efficiency of WAMAC and ensures best use is made of disposal capacity at the LLWR. There are two receipt options for compactable waste at WAMAC:
 - a) Line 1 is for bagged or wrapped waste only.
 - b) Line 2 is mainly for shreddable material.
- 1.3. Regardless of the waste stream chosen, if the container is to be collected by the WAMAC skip loader, the maximum permissible weight of waste and container must not exceed 6.5 tonne.
- 1.4. If the type 0075 container can be collected by road trailer (rather than skip loader), then the maximum weight of waste and container can be increased, however any such increase must comply with the appropriate Package Handling Requirements and should only be undertaken with the agreement of the WAMAC Transport Department.
- 1.5. Customers are required to make all reasonable efforts to ensure that waste is distributed evenly throughout the container to assist with loading operations onto the skip loader/trailer.
- 1.6. The contents of the type 0075 container are unloaded by tipping, therefore customers are required to make all reasonable efforts to ensure that waste flows freely from the container when it is tipped, i.e. waste must not be densely packed into the container such that it becomes jammed or wedged inside.
- 1.7. Items should be size reduced as far as reasonably practicable to enable the most efficient filling of the container.

Line 1

- 2.1. Unless otherwise agreed in writing with LLW Repository Ltd, Line 1 is for bagged or wrapped waste exhibiting the following properties:
 - a) No individual item shall exceed 100kg.
 - b) Waste shall be dry and compactable.
 - c) Small uncompactable items may be acceptable for sentencing through Line 1 subject to prior agreement with WAMAC, e.g. small tools and



similar items (valves, pumps, and motors). The consignor customer must ensure all items are drained of liquor prior to consignment. Whilst these items are non compactable, they will merge with compactable items in the same box when compacted. Such items should not comprise more than 10% of any consignment and must be clearly identified with 'Uncompactable Waste' identifier tape. This tape is available on request from WAMAC Manufacturing Support, B90, Sellafield.

- d) Waste shall be bagged in standard size transparent polythene bags with the neck of the bag taped then folded and taped again for retention of the contents.
- e) The bag shall be no greater than 800mm in any direction, so that it is able to pass freely through a hopper aperture of 1000mm x 800mm.
- f) Waste shall be loaded by the customer into an approved Transport Container.
- g) Individual bags should not be totally filled with reassertable materials such as rubber boots, gloves etc. This type of content should be mixed with paper or cloth based material to reduce the likelihood of reassertion
- h) Unboxed HEPA filters must be consigned in a transparent polythene bag with the neck of the bag taped, and contained within another transparent polythene bag with the neck of the bag taped then folded and taped again for retention of the contents. To minimise powder or dust arising under high force compaction, the package should then be placed in a breathable poly cotton bag.
- i) Boxed HEPA filters can be contained in transparent polythene bag with the neck of the bag taped then folded and taped again for retention of the contents. To minimise powder or dust arising under high force compaction, the package should then be placed in a breathable poly cotton bag.
- j) It is acceptable for the breathable poly cotton bag to be placed within a polythene bag to support retention of labels on the package.
- k) If individual filters are not likely to generate powder or dust arising under high force compaction, (e.g. inlet filters) then the breathable poly cotton sack may not be required. Omission of the bag will be approved via submission of a Form D5.

Line 2

2.2. Line 2 is for unbagged shreddable waste exhibiting the following properties:

- a) No individual item shall exceed 100kg.
- b) The maximum width of an individual item is 1000mm, the maximum length of an individual item is 2000mm.



- c) Waste shall be dry and compactable.
- d) Waste shall be loose filled shreddable materials, unless meeting the bagged criteria below.
- e) Waste shall be loaded by the customer into an approved Transport Container.
- f) Any waste that is suitable for shredding but for handling reasons has to be bagged must be wrapped in clear PVC and clearly identified with 'WAMAC Shreddable' identifier tape. This tape is available on request from WAMAC Manufacturing Support, B90, Sellafield. This enables the WAMAC operator to discriminate between bagged waste for placement directly into a 1m³ box and bagged waste for shredding.
- g) The customer shall ensure that only bagged items suitable for shredding are identified with 'WAMAC Shreddable' identifier tape, such bags must not include items which may damage the shredder, e.g. tools etc.
- h) Mixing of shreddable and non-shreddable wastes: Whilst there is no restriction on the ratio of 'waste requiring shredding' to 'bagged waste' in an individual consignment, the customer will make all reasonable efforts to utilise Line 1 for waste not requiring shredding.
- i) The customer will indicate the percentage of shreddable waste contained within a consignment via the Consignment Information Form D4.



**PART A, APPENDIX 8: ADDITIONAL SPECIFICATION FOR THE
CONSIGNMENT OF DRUMMED REASSERTABLE WASTE**

- 1.1. Drums of reassertable waste shall be segregated into two standard weight bands:
 - Weight Band 1 – up to and including 100kg weight of waste and primary containment
 - Weight Band 2 – 101kg – 140kg weight of waste and primary containment
- 1.2. Drums of reassertable waste shall be labelled Weight Band 1 or Weight Band 2 on the top and side of the drum
- 1.3. Drums of reassertable waste shall be consigned in a Transport Container with a maximum of 30% quantity of Weight Band 2 drums permitted in any consignment.
- 1.4. The Form D4 for the consignment shall include within Section 3, identification that the consignment contains drums of reassertable waste and the number of drums of reassertable waste to identify this consignment to LLW Repository Ltd.
- 1.5. Consignments containing drums of reassertable waste in excess of the Weight Bands, as detailed in 1.1 above, and / or consignments which are not packaged in the proportions detailed in 1.3 above, shall require approval using the Form D5 route.



**PART A, APPENDIX 9: ADDITIONAL SPECIFICATION FOR THE
CONSIGNMENT OF UNDRUMMED COMPACTABLE FILTER WASTE IN A
FULL HEIGHT IP2 APPROVED TRANSPORT CONTAINER**

- 1.1. Filters may be consigned for compaction in a Full Height IP2 approved Transport Container if they meet the following specification.
- 1.2. Acceptable filters are either the Vokes rectangular type – 600mm x 600mm x 300mm or Vokes cylindrical type - 510mm diameter x 610mm high.
- 1.3. Radiation levels on an individual filter must not exceed 100 micro sieverts per hour gamma.
- 1.4. Unboxed HEPA filters must be consigned in a transparent polythene bag with the neck of the bag taped, and contained within another transparent polythene bag with the neck of the bag taped then folded and taped again for retention of the contents. To minimise powder or dust arising under high force compaction, the package should then be placed in a breathable poly cotton bag.
- 1.5. Boxed HEPA filters can be contained in transparent polythene bag with the neck of the bag taped then folded and taped again for retention of the contents. To minimise powder or dust arising under high force compaction, the package should then be placed in a breathable poly cotton bag.
- 1.6. It is acceptable for the breathable poly cotton bag to be placed within a polythene bag to support retention of labels on the package.
- 1.7. If individual filters are not likely to generate powder or dust arising under high force compaction, (e.g. inlet filters) then the breathable poly cotton bag may not be required. Omission of the bag will only be by approval via the Form D5 route.
- 1.8. No individual bag must exceed 100kg.
- 1.9. Any combination of rectangular filters and / or cylindrical filters may be consigned in a single IP2 approved Transport Container. Filters may also be consigned with other waste in the same container. Each waste type (e.g. rectangular filters, circular filters or other waste) should be grouped together within the transport container to support unloading and compaction operations.
- 1.10. The Form D4 for the consignment shall include within Section 3, identification that the consignment contains loose filters and the number of loose filters within the consignment.



- 1.11. Any variations to the above specification must be approved through the Form D5 route.



PART B: PROCEDURES FOR ACCEPTANCE

WASTESTREAM IDENTIFICATION

- B1. a) All waste for disposal at LLWR must be covered by a valid Wastestream Characterisation Document (WSCD) approved by LLW Repository Ltd. A copy of the WSCD shall be submitted through the Low Level Waste Service Manager, for approval. Approval or rejection (stating clearly the reasons) shall be provided by LLW Repository Ltd within six weeks of receipt of the WSCD. The WSCD shall describe for each Wastestream:
- Wastestream Identifier (number and name) and Consignor Code.
 - Description of the process generating the waste.
 - Estimated annual, total and cumulative arisings for the Wastestream in terms of activity (Total Alpha and Total "Others"), volume, mass and timescale.
 - Estimated annual, total and cumulative arisings for the specific activity groupings (Uranium, Cobalt 60, Tritium, Carbon 14, Iodine 129, Other Alpha, Radium 226/Thorium 232 and Others).
 - Whether the waste is a new arising or has been identified in previous UK Radioactive Waste Inventory estimates.
 - Physical and chemical composition.
 - Non-radiological Hazardous Waste components.
 - Conditioning and Treatment of the waste
 - Containment and Packaging of the waste
 - Service required (High Force Compaction/grouting/disposal)
 - Method of radioactivity content assessment
 - Radionuclide composition and radionuclides to be declared on the Form D4
 - Means by which the waste is controlled to demonstrate that it is within the relevant VLLW / LLW activity limits
 - Justification of the disposal route (for example by BPM and/or BPO assessment)
- b) If closed sources (sealed sources, laminated sources and/or homogeneous sources), as defined in The Radioactive Substances (Waste Closed Sources) Exemption Order 1963 (or as amended), are present they shall be considered as a separate Wastestream and will require prior approval by LLW Repository Ltd using the Form D5 route.



- c) The Wastestream identifier used shall be the UK Radioactive Waste Inventory Wastestream name and number if appropriate. If this is not available, a Wastestream identifier will be assigned by LLW Repository Ltd.
- d) The arrangements detailed in the WSCD shall include the requirements for a defined and documented periodic review of the Wastestream to be performed by the customer. After internal review the WSCD is to be submitted and subject to LLW Repository Ltd formal approval before it can be used to dispose of waste. Where changes or revisions are not required following an internal review at the time of revalidation, the WSCD should still be resubmitted for formal LLW Repository Ltd approval.

QUALITY ASSURANCE AND COMPLIANCE

- B2. The Customer shall prepare, in writing, a QA document detailing the arrangements established to ensure the effective management and control of solid low level waste from the generation of the waste to the point of acceptance by the LLW Repository Ltd.
- B3. All waste for disposal at the LLWR must be covered by a valid QA document. A copy of the approved QA Document shall be submitted through the Low Level Waste Service Manager.
- B4. The arrangements detailed in the QA document shall include the requirements for a defined and documented periodic review of the arrangements to be performed by the customer's quality assurance representative. The arrangements shall also describe how proposed changes to the arrangements, if necessary, shall be controlled.
- B5.
 - a) The Customer shall submit the arrangements made under the QA documents and CFA to audit by LLW Repository Ltd or its appointed agent, such agent agreed by LLW Repository Ltd and the Customer, at a frequency, or at times, established in consultation between the Parties. Agreed corrective action resulting from such audits shall be implemented within six months unless otherwise agreed. If non-conforming waste for Consignment is identified during an audit, receipt by LLW Repository Ltd of further consignments will be subject to review.
 - b) Customer's wastes are also subject to a programme of waste receipt monitoring which may require LLW Repository Ltd to carry out one or more of the following:
 - i) Test and inspect a Consignment before despatch.



- ii) Require samples or a Consignment to be sent to LLW Repository Ltd for inspection before conditioning to its consigning wasteform.
- iii) Test and inspect after Delivery of a Consignment.

Any non-conforming wastes found may require collection by the customer and an investigation to be carried out by the customer as to the reasons for the non-conformance. Receipt by LLW Repository Ltd of further deliveries is dependent on completion of the resulting investigation recommendations.

NOTIFICATION OF INTENDED CONSIGNMENT

- B6. For all Consignments a minimum of five working days' notice is to be given to the LLW Repository Ltd nominated officer. The draft completed Form D4 shall be used to give notice of the intention to send a Consignment. The nominated officer will fax (or contact by other agreed means) the customer, giving consent to deliver or rejecting the proposed Consignment, within three working days of receipt of the notification referred to above, except if detailed assessment is required in which case notice of this will be given in the said period. Notwithstanding the above, for Consignments of other than uraniferous waste or where assessments or special handling are required, LLW Repository Ltd will endeavour to accept a Consignment within three working days notice.
- B7. **[Paragraph intentionally left blank]**
- B8. Consent to deliver shall be given by faxed (or communicated by other agreed means) Form D3 from the nominated officer or a person stated to be acting on his behalf before any Consignment is delivered.
- B9. Each Consignment shall be accompanied by a properly completed Form D4 to the latest revision. The Consignment shall correspond in all respect with details given.
- B10. Form D4 shall be completed in compliance with the approved QA documentation. The duly signed Form D4 shall be clearly legible with any alterations being initialled by an authorised person. The "original" paperwork shall accompany the Consignment; a copy is not acceptable for this purpose. Furthermore if the Consignment includes any Hazardous Waste, the customer shall provide appropriate paperwork as detailed in the Hazardous Waste Regulations. (see Paragraph A16).
- B11. **[Paragraph intentionally left blank]**



- B12. **[Paragraph intentionally left blank]**
- B13. **[Paragraph intentionally left blank]**
- B14. a) A Consignment shall not be consigned to LLWR if sent as a part-load with other materials that are not LLW and/or VLLW on the same vehicle.
- b) Customers may deliver waste by rail, subject to LLW Repository Ltd's consent, such consent not to be unreasonably withheld.
- B15. Customer's representatives, when on LLW Repository Ltd and/or its agent's sites, shall observe the site rules.
- B16. LLW Repository Ltd or its agents will unload the contents of the Transport Container and ensure the container is available for return to the Customer in as good condition as when delivered and within a time frame agreed with the customer.



GLOSSARY

“Accepted LLW” means LLW which has been Delivered and meets the Acceptance Criteria applicable at the time of Delivery and will be disposed of at LLWR, and “Accepted” and “Acceptance” in respect of LLW has a corresponding meaning.

“Acceptance Criteria” means the technical specifications set out in Part A and procedures set out in Part B and relevant Statutory Regulations applicable to the customer in respect of the transport, treatment and disposal of LLW.

“Bulk Chemical Compound” means discreet (>1kg mass) specific purposeful accumulations in one space of (typically) manufactured salts of elemental combinations, usually having anionic and cationic components.

“Combustible Wastes” means those wastes which are solid substances and preparations which may readily catch fire after brief contact with a source of ignition and which continue to burn or to be consumed after removal of the ignition source. Such wastes are suitable for segregation prior to consignment, thus enabling LLW Repository Ltd to undertake further treatment of waste thus consigned for the purpose of reducing the final volume of material for disposal

“Compactable Wastes” means those wastes for which best practicable means are sufficient to render them into a form suitable for High Force Compaction and which if subject to High Force Compaction and allowing for Reassertion could reasonably be expected to be reduced in volume by 30% or more.

“Complexing Agents” means either chelating agents or monodentate organic ligands.

“Consign”, in the context of waste, means to transfer to LLW Repository Ltd for the purpose of disposal at LLWR, and “Consigned” has a corresponding meaning.

“Consignment” means one Transport Container or one Disposal Container and its contents of waste and packaging with a maximum container volume of 40m³, received from a single customer on one road or rail vehicle and as specified on an individual Form D4.

“Decay Products” means those radionuclides succeeding another radionuclide in the radioactive decay chain in which both, or all, occur.

“Delivered” in respect of any Consignment means that the lifting gear has been attached to that Consignment at LLWR or Sellafield as the case may be or shall be deemed to occur within 48 hours of arriving at LLWR or Sellafield, whichever is the sooner, and “Delivery” has a corresponding meaning.



“Disposal Containers” means those containers that are used for the grouting and disposal service and are listed in Part A Appendix 3 Section III or accepted for use in accordance with paragraph A1.

“Free Liquor” means that liquid which is present as a separate phase (including that, which is physically absorbed onto a solid matrix rather than chemically combined).

“Gross Envelope Volume” means the volume represented by the maximum external dimensions of a container. For a Disposal Container this means the cuboid volume as stated in Part A Appendix 3 represented by the maximum length, width and height. For a compacted or uncompacted drum this means the cylindrical volume represented by the maximum diameter and height.

“High Force Compaction” means the application of pressure of at least 20,000 kN/m². “High Force Compacted” has a corresponding meaning.

“Impermeable Drum Liner” means a bag or container, which is placed inside a drum, that completely lines the drum internal surfaces and prevents the LLW contacting the drum walls. The bag or container material and construction does not allow the ready passage of air through it.

“Inaccessible Voidage” means that voidage within a Disposal Container, which will not be readily penetrated by in-fill grout.

“Ion Exchange Material” means any material, whether synthetic or naturally occurring, that has the capability of interchanging ions from one substance to another by means of a reversible chemical or physical process.

“LLW” means solid low level radioactive waste in accordance with the specification described in Part A.

“LLWR” means the Low Level Waste Repository, the low level radioactive waste disposal site in West Cumbria.

“LLWR Disposal Authorisation” means the current Authorisation (BZ2508) for the LLWR issued by the Environment Agency pursuant to the RSA.

“Loose Drum” consignment means drums delivered uncontainerised (e.g. on a pallet placed on a flat-bed lorry/van or a drum overpack) and not in an approved FHISO container.

“Metallic Waste” or “Metallic Material” means Steel, Aluminium, Brass, Copper and Lead items suitable for segregation prior to consignment, thus enabling LLW Repository Ltd to undertake further treatment of waste thus consigned for the purpose of reducing the final volume of material for disposal.



“Mixed Waste” means more than one waste type (ie metallic, combustible, compactable or non compactable) in a single consignment.

“Other Alpha”, for the purpose of Form D4 completion, means those alpha emitting radionuclides with half-lives greater than three months excluding uranium, radium 226 and thorium 232.

“Other Containers” means containers, other than nominal 200 litre drums, which have been accepted by LLWR for the containment of LLW for transport to WAMAC for High Force Compaction.

“Others”, for the purpose of Form D4 completion, means beta emitting radionuclides with half lives greater than three months excluding Carbon 14, Iodine 129, Cobalt 60 and Tritium but including Iron 55.

“Reactive Metals means those elements located in Group IA (first column) of the periodic table, (alkali metals) and those elements located in Group IIA (second column) of the periodic table (alkaline earth metals).

“Reassertion” means the increase in volume of a high force compacted drum or box within a period of thirty minutes after release of the high force compaction pressure and containment following High Force Compaction.

“RSA” means the Radioactive Substances Act 1993 (or as amended) including consolidations of previous acts, any current amendments thereto or any re-enactment thereof.

“Sellafield” means Sellafield Ltd’s Nuclear Licensed Site at Sellafield, Cumbria.

“Short Half-Life” means, for the purpose of Form D4 completion, those radionuclides with a half-life of three months or less. These need only be accounted for in the Form D4 disposal information if they are not present as Decay Products with a reported parent radionuclide, or if they are present in amounts exceeding that which could be present through radioactive decay of the accounted parent radionuclide.

“Soluble Solids” means any solid chemical compound that is indicated as having a soluble or slightly soluble property in water in the CRC “Handbook of Chemistry and Physics” (“Rubber Bible”) 88th edition (or as amended).

“Transport Containers” means those containers that are used for the High Force Compaction service and are listed in Part A Appendix 3 Section II or accepted for use in accordance with paragraph A1.

“Third Party Wastes” means those, which are consigned by an organisation other than the organisation, which generates the waste.



“Uncompactable Waste” means those wastes that are not compactable or those wastes for which best practicable means are insufficient to render the wastes into a form suitable for such Compaction.

“Very Low Level Waste” or “VLLW” means segregated items whose radioactive content shall not exceed four Megabecquerels per tonne (MBq/te) for all isotopes, with the exception of H3 (Tritium) for which the concentration limit is 40 MBq/te

“WAMAC” means Sellafield Ltd’s Low Level Waste monitoring and High Force Compaction plant at Sellafield, Cumbria.

“Waste and Primary Containment Weight” means the weight of the waste items and immediate containment. For LLW consigned to the LLWR this means the weight of the Disposal Container and contents. For LLW consigned to WAMAC this means the weight of nominal 200 litre drums, or Other Containers, and their contents or the weight of loose waste in Other Containers.

“Wastestream” means a grouping of LLW from a common source of similar radionuclide composition and defined in the appropriate Wastestream Characterisation Document.

“Wastestream Characterisation Document” (WSCD) means documentation describing the physical, chemical and radiochemical content, estimated arisings, conditioning and packaging and justification of assessment methodology of the wastestream. The content of the WSCD is more fully described in Part B paragraph 1(a).