Waste Management Services
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Our Role

LLW Repository Ltd has more than 10 years’ experience of successfully working with our customers to develop solutions across the radioactive waste lifecycle and provide access to the full range of treatment, logistics, and disposal techniques and technology in the UK, Europe, and Globally.

As part of its role as the NDA’s Low Level Waste (LLW) management contractor, LLWR is leading the implementation of the UK Strategy for the Management of Solid Low Level Radioactive Waste from the Nuclear Industry, as approved by Government in February 2016, in addition to the 2019 UK Integrated Waste Management Radioactive Waste Strategy, through the LLW National Waste Programme.

The core objectives of the programme are to:

- Implement the Waste Management Hierarchy
- Enable best use of existing assets
- Enable use of flexible fit-for-purpose solutions to make best use of the Low Level Waste Repository site
- Deliver value-for-money

To deliver this, LLWR has developed a number of radioactive waste management services which are available to the nuclear industry and other producers of radioactive waste. These services provide access to a broad range of supply chain waste management expertise and facilities for treatment and disposal of radioactive waste.
Who are we?

LLW Repository Ltd (LLWR) is a nuclear site licence company. We are responsible for the management and operation of the UK’s national facility for permanent disposal of low level radioactive waste, located near the village of Drigg in West Cumbria.

We are also responsible for delivering the National Waste Programme on behalf of the NDA and providing a range of waste management services to help waste producers follow the waste management hierarchy – diverting waste from disposal at LLWR to alternative reuse, recycling, treatment and disposal routes.

Our site and our business are essential to the successful delivery of the NDA’s mission; to clean up the UK’s nuclear legacy. However, we are also vital to non-NDA organisations in the nuclear energy, defence, industrial, medical and research sectors. These organisations need us now and in the future.
Thinking differently about waste

**VISION**
To be our customer’s first choice for waste solutions and trusted stewards of the UK’s national radioactive waste repository.

**MISSION**
Operating the national repository; implementing the NDA’s strategy through the provision of integrated radioactive waste treatment, logistics and disposal solutions; and support the UK’s radioactive waste programmes.
The Benefits

Access to the full spectrum of waste management capability

World Class Expertise

Waste Processing, Treatment & Volume Reduction

Logistics Solutions

Disposal Solutions

Tier 2 Contractors

Minor Producers
Benefits of the LLWR Services:

Access to the full spectrum of waste management capability

Economies of scale and value for money

Expert waste management advice

Public Procurement Regulations compliance

Accelerated procurement route and contract management administration

Management of capacity/demand on suppliers

Common supply chain assurance framework
Our Services
This service includes the provision of technical expertise and waste management personnel to support waste management and decommissioning projects and the ability to identify and access cost-effective off the shelf solutions and adapt for use to meet specific applications.

The expertise available includes:

- Strategic advice, technical analysis, optioneering, safety cases, Best Available Technique (BAT)/Best Practicable Means (BPM)
- Provision of onsite support for radioactive waste management activities throughout the waste lifecycle, including characterisation, de-planting, size reduction and packaging of waste
- Services available include onsite or off-site sorting and segregation in appropriately permitted and licensed facilities. Waste can then be consigned onwards to the most appropriate downstream treatment and disposal facility
- Onsite project/programme management for larger complex jobs
- Technical support for container inspection and package licensing
- Dangerous Goods Safety Advisors, Waste Loading Plan support, Radiation Protection Advisor Support
Pre-acceptance checks prior to unloading

Sort and segregation of waste prior to further processing
Waste Characterisation & Assurance

Characterisation is a collection of techniques used to provide information on the physical, chemical and radiological properties of waste.

The output of characterisation (such as radiological fingerprints) are used (alongside other considerations such as BAT and the Waste Hierarchy) to make decisions about the arrangements and routes for specific wastes.

Customers can access a full spectrum of capability for:

- Planning, delivering and/or interpreting the results from characterisation activities
- Health Physics monitoring, non-destructive assay, determination of waste properties, computer modelling, and collection of samples
- Accredited laboratory analysis for samples of LLW, ILW and hazardous waste
This service provides treatment of all main metal types such as carbon steel, stainless steel, iron, lead, aluminium, copper and brass for recycling, or, in higher contamination cases, for volume reduction and disposal.

- Complete turn-key service from on-site waste preparation through to final disposal of nuclides, including management of any overseas treatment routes where needed
- Treatment ranging from suspect-clean mixed-scrap to items at the top of LLW range, or beyond, including items used for spent fuel handling such as skips and flasks
- Waste streams can be mixed metals, requiring sorting & segregation, to very large single items of up to more than 600 tonnes in weight
- Recycling has been widely adopted in the UK, and internationally, for several decades and is the best available technique where items cannot be directly reused
Various metallic waste processing methods:

**Surface treatment**
which may consist of abrasive cleaning, blasting, machining, milling, chemical cleaning, or water jetting.

**Volume reduction**
including hot and cold cutting techniques and shredding.

**Smelting**
which allows metals to be recycled or reused (e.g. shielding blocks) or volume reduced and sent for disposal.
Combustible

Thermal treatment of radioactive waste is a very effective volume reduction and stabilisation technique. A wide range of wastes can be thermally treated including organics, plastics, wood, oils and solvents.

✔ Waste is treated in dedicated facilities or co-treated with non-radioactive waste remaining isotopes are captured in the solid secondary waste (ash) as VLLW or LLW for disposal

✔ Volatile components are driven off during the burn process and discharged to atmosphere in the gas stream or to water as a liquid effluent

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<th>Suitable waste for combustible treatment</th>
<th>Solid</th>
<th>Liquids</th>
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<td>Barrier waste and PPE</td>
<td>Oils</td>
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Producing energy from waste through thermal treatment

Drums loading onto conveyor

Wheelie bin hoist
Supercompactable

Super-compaction is a common volume reduction technique used for supercompactable waste prior to disposal.

1. A range of wastes may be compacted by applying 1,400te to a maximum of 2,000te of pressure.

2. Waste is pre-packed in 210ltr drums. The drum is then compacted into a ‘puck’.

3. The final ‘puck’ is loaded into containers for disposal.
The Alternative Treatment service is designed to develop and deploy new or existing solutions for problematic or difficult waste streams.

The service includes access to technical expertise, trials and implementation of new and improved radioactive waste treatment techniques.

This service is designed to access innovation and cutting edge technology to solve difficult waste management challenges.
LLWR provide a range of packages for the transport and disposal of waste such as:

- IP-rated Soft Sided Packages and bags
- IP-rated metal and fibre drums
- A range of ISO Containers for transport and disposal (Third-Height, Half-Height)
- Type B Novapak and TN Gemini containers for transport of fissile materials
- Support in the development of Waste Loading Plans
- Access to the supply chain for a range of other containers that can be used to support the shipment of waste

Further information can be found in the Logistics Brochure available on the website:

[www.gov.uk/llwr](http://www.gov.uk/llwr)
IP2 Solid/Liquid Drum (TC14) & IP2 Drum for Super-compaction (TC19)

HHISO Container TC01/TC01R
The Transport and Logistics service offers customers access to a portfolio of world-class transport expertise offering multi-modal shipments of radioactive waste to UK, European and global destinations.

- The service provides road, rail and sea transport options through our supply chain partners
- We have access to a wide range of equipment and trailer designs for transporting a wide range of packages
- We have extensive experience of providing logistics solutions for containerised and non-containerised large items such as ductwork and boilers
- The LLWR team will develop logistical solutions to meet customer needs in line with all applicable UK and international standards and regulations
Full height ISO side loader unloaded

Containers on a roll-on/roll-off (RORO) Ferry

UK Rail Service
Waste with low activity levels that fall within the categories of High Volume Very Low Level Waste (HV-VLLW) or Low Active Low Level Waste (LA-LLW) can be disposed to permitted landfill sites.

LLWR has several landfill sites available through our supply chain which are able to accept a wide range of hazardous and non-hazardous wastes. This includes wastes with various activity levels from 4Bq/g up to several hundred Bq/g.

Typical packages used for disposal can include:

- Soft Sided Packages
- Drums or ISO containers
- Wrapped and un-wrapped single items

**Note:** In order to satisfy relevant insurance requirements under the Nuclear Installations Act 1965 it is necessary for LLWR to assume liability through ‘relevant carriage’ for the material in transit from the customer’s site to the landfill.
Soft Sided Packages in landfill
LLWR operates the UK’s National Low Level Waste disposal facility situated near the village of Drigg in West Cumbria.

Waste is typically disposed of in Half-Height or Third-Height ISO containers that are delivered by rail or road. All waste is required to meet the LLWR Waste Acceptance Criteria (WAC) or an approved variation.

Once the waste has been accepted by LLWR for disposal, the container is grouted prior to disposal in an engineered concrete vault at the Repository site.

Once the vault reaches capacity a final engineered cap will be constructed over the vault, providing long-term protection to the wastes and the environment.
National Low Level Waste disposal facility
For further information please contact the LLWR Customer Team:

customerteam@llwrsite.com or call 019467 70300

www.gov.uk/llwr