Gloucestershire Waste Management, Need & Infrastructure Capacity Assessment 2022

Scoping of 'Other' Waste Streams

Report: Final Issue

Version: 2.0

Issued: June 2024

BPP Consulting Document Control

Project: Gloucestershire Waste Management, Need & Infrastructure Capacity Assessment 2022

Report: Scoping of 'Other' Waste Streams

Version Description: Final Issue

Version No: v2.0

Date: 14.06.2024

Version No.	Version Description	Author	Date	Reviewed	Date
1.0	Draft for Client review	Alan Potter (Partner)	02.05.2023	*Lorraine Brooks (Client Reviewer)*	*13.06.2023*
1.1	Post Client Review	Ella Mills (Data Analyst)	11.01.2024	Alan Potter (Partner)	11.01.2024
2.0	Final Issue	Ella Mills (Data Analyst)	14.06.2024	Alan Potter (Partner)	14.06.2024

Contents

Table of Tables

Abbreviations

AD	Anaerobic Digestion
AMP	Asset Management Plan
C & I	Commercial & Industrial Waste
C, D & E / CDEW	Construction, Demolition & Excavation Waste
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EfW	Energy from Waste
EWC	European Waste Catalogue
HLW	High Level Radioactive Waste
LACW	Local Authority Collected Waste
PPG	Planning Practice Guidance
VLLW	Very Low Level Radioactive Waste
WDF	WasteDataFlow
WDI	Waste Data Interrogator
WMINCA	Waste Management and Infrastructure Need Capacity Assessment
WPA	Waste Planning Authority
WRMP	Water Resource Management Plan

Glossary of Terms

Agricultural Waste	Waste produced on a 'farm' in the course of 'farming'. Agricultural waste takes both 'natural' (or organic) and 'non- natural' forms e.g. plastics and metal.
Anaerobic Digestion	A process to manage organic matter including green waste and food waste broken down by bacteria in the absence of air, producing a gas (biogas) and nutrient rich solid or liquid (digestate). The biogas can be used to generate energy either in a furnace, gas engine, turbine or to power vehicles, and digestate can be applied to land as a fertiliser.
Asset Management Plan	An asset management plan produced by sewerage and water undertaking for approval by Ofwat includes an assessment of what assets make up the water, sewer or storm system in a particular area and plans to meet future needs within agreed budgets.
Biodegradable waste	Waste that can break down over time due to natural biological action/processes, such as food, garden waste and paper.
Commercial Waste	Waste from factories or premises used for the purpose of trade or business, sport, recreation or entertainment
Controlled Waste	Waste subject to controls emanating from the EU Waste Framework Directive.
Construction, Demolition & Excavation Waste	Waste arising from the building process comprising demolition and site clearance waste and builders' waste from the construction/demolition of buildings and infrastructure. Includes masonry, rubble and timber.
Defra	The UK Government department responsible for developing national waste management policy.
Energy from Waste	The conversion of the calorific value of waste into energy, normally heat or electricity through applying thermal treatment of some sort. May also include the production of gas that can be used to generate energy.
Environment Agency	The body responsible for the regulation of waste management activities through issuing permits to control activities that handle or produce waste. It also provides up-to-date information on waste management matters and deals with other matters such as water issues including flood protection.
European Waste Catalogue (EWC)	Comprehensive listing of wastes divided into 20 chapters, most of which are industry-based, although some are based on materials and processes. Each waste type is assigned a unique six-digit code. Otherwise referred to as List of Waste (LoW).
Exemptions	Certain activities exempt from the need to obtain an environmental permit. Each exemption has specific limits and conditions that must be complied with to remain valid. Exemptions must be registered with the Environment Agency. Each registration lasts 3 years.
Green waste	Biodegradable plant waste from gardens and parks such as grass and hedge trimmings, from domestic and commercial sources suitable for composting.
Hazardous Waste Landfill	Sites where hazardous waste may be disposed by landfill. This can be a dedicated site or a single cell within a non-hazardous landfill, which has been specifically designed and designated for depositing hazardous waste.
Hazardous Waste	Waste requiring special management under the Hazardous Waste Regulations 2005 due to posing potential risk to public health or the environment (when improperly treated, stored, transported or disposed). This can be due to the quantity, concentration, or characteristics of the waste.

Household Waste	Waste from households collected through kerbside rounds, bulky items collected from households and waste delivered by householders to household waste recycling centres and "bring recycling sites". along with waste from street sweepings, and public litter bins.
Incineration	The controlled combustion of waste. Energy may also be recovered in the form of heat (see Energy from Waste).
Industrial Waste	Waste arising from any factory and from any premises occupied by an industry (excluding mines and quarries).
Landfill (including land raising)	The permanent disposal of waste to land, by the filling of voids or similar features, or the construction of landforms above ground level (land-raising).
Local Authority Collected Waste	Waste collected by or on behalf of a local authority. Includes household waste and business waste where collected by a local authority and non-municipal fractions such as construction and demolition waste delivered to HWRCs. LACW is the definition used in statistical publications, which previously referred to municipal waste.
Non-Hazardous Waste Landfill	A landfill permitted to accept non-inert (biodegradable) wastes e.g. municipal and commercial and industrial waste and other non-hazardous (including inert) wastes. May only accept hazardous waste if a special cell is constructed.
Ofwat	The regulatory body responsible for overseeing the privatised water and sewage industry in England and Wales.
Recovery	Subjecting waste to processes that recover value including recycling, composting or thermal treatment to recover energy.
Recycling	The reprocessing of materials extracted from the waste stream either into the same product or a different one.
Refuse Derived Fuel	A fuel produced to a contract specification by processing the combustible fraction of waste.
Residual Waste	Waste remaining after materials for re-use, recycling and composting/organic waste treatment e.g. anaerobic digestion have been removed.
The Plan area	The area subject to the Waste Local Plan to which this study relates. In this case the county of Gloucestershire including the Lake District National Park.
Waste Planning Authority	The authority responsible for planning for waste within a specific administrative area. In this case Gloucestershire County Council.
Waste Transfer Station	A site to which waste is delivered for sorting or baling prior to transfer to another place for recycling, treatment or disposal.
Water Resources Management Plans	Statutory documents that all water companies must produce at least every 5 years intended to set out how they will achieve a secure water supply while also enhancing the environment.

1. Introduction

Gloucestershire County Council (GCC) has contracted BPP Consulting to produce the Gloucestershire Waste Management Need and Infrastructure Capacity Assessment (WMNICA) 2022. This is with the intention of informing a review of the Gloucestershire Waste Core Strategy (adopted November 2012), which is to be updated to cover a Plan period to 2041.

The WMNICA consists of the following documents:

The WMNICA consists of the following reports:

1. Local Authority Collected Waste - Assessment of Management Requirements to 2041;
2. Commercial & Industrial Waste - Assessment of Management Requirements to 2041;
3. Construction, Demolition & Excavation Waste - Assessment of Management Requirements to 2041;
4. Hazardous Waste - Assessment of Management Requirements to 2041;
5. Scoping Review of Other Waste Streams;
6. Review of Strategic Waste Flows; and
7. An Overview Report.

This report presents the findings of a scoping review of 'other' waste streams which includes:

- Wastewater
- Agricultural Waste
- Low Level Radioactive waste

As national Planning Practice Guidance (PPG) advises that Waste Planning Authorities (WPAs) should seek to plan for these streams, this report is intended to determine if it is necessary to expressly provide for these 'Other' waste streams and therefore account for them in the WMNICA in detail.

1.1 Advice on Data

The principal source of advice with respect to the use of data to inform production of a Plan evidence base is the national PPG available at: https://www.gov.uk/guidance/waste.

This states that:

"*Assessing waste management needs for Local Plan making is likely to involve:*

- *understanding waste arisings from within the planning authority area, including imports and exports*
- *identifying the waste management capacity gaps in total and by particular waste streams*
- *forecasting the waste arisings both at the end of the period that is being planned for and interim dates*
- *assessing the waste management capacity required to deal with forecast arisings at the interim dates and end of the plan period."*

Paragraph: 022 Reference ID: 28-022-20141016

It includes a section entitled "Using data to monitor and forecast waste needs", which articulates the following principles, should waste planning authorities adopt, when using data to plan for the management of waste arising in their respective administrative i.e. Plan area:

- *Make clear assumptions on how data were handled, as well as their impact (including on forecasting)*
- *Provide data to an appropriate level of significance, based on their explicit assumptions. In practice, data quoted to more than 2 or 3 significant figures will not be helpful and spurious accuracy stemming from precise figures should be avoided*
- *Plan for a range of each type of waste rather than a specific single figure."*

Paragraph: 036 Reference ID: 28-036-20141016 Revision date: 16 10 2014

1.2 Principal Data Sources

The principal data sources used to generate this WMNICA are as follows:

Waste Data Interrogator

Operators of all sites permitted to manage waste submit quarterly returns on the quantities, types and origin of waste received and, where applicable, destination of waste removed at their sites. These returns are collated by the Environment Agency (EA) and are included in a national database known as the Waste Data Interrogator (WDI). This is released approximately nine months after the end of the calendar year to which the data relates. The 2021 WDI (version 3 released Jan 2023) consisting of data for the calendar year 2021 is the most current version available at the time of writing.

Hazardous Waste Interrogator

Producers and managers of hazardous waste must notify the environment agencies (which, depends on which part of the UK) of movements of waste classed as hazardous. This data is collated and reported in the Hazardous Waste Data Interrogator (HWI). Data is currently reported down to receiving local area rather than by receiving site. The HWI 2021 was released in September 2022.

Wastedataflow

Wastedataflow[1] (WDF) is a web-based data entry portal for local authorities to report on local authority waste management arrangements to central Government on a quarterly basis. The data input is used to report on national recycling and landfill diversion performance as well as local authority league tables on recycling rates etc following independent quality checking. While Councils normally report in financial years, as the EA WDI reports for calendar year the data for Gloucestershire covering the four quarters of 2021 has been accessed to ensure comparability between datasets.

While the above data sources may be used to inform the generation of estimations for the principal waste streams, the data to estimate arisings of 'Other' waste streams is less readily available and as a result quantifying and forecasting arisings is more problematic.

Nevertheless, given the nPPG advises Waste Planning Authorities (WPAs) to plan for these streams the following is an analysis of the quantities that may arise within each of the target waste streams and assessment of how well existing arrangements may cope in future.

1.3 Data Presentation

In order to respect the need to avoid "spurious accuracy", the following approach has been taken:

1. Where actual tonnage data has been accessed, this has been used in the computations.
2. Where data has been subject to computation, this has been included to 3 sf. Final values discussed in the text are rounded to the nearest 500.
3. Where percentages have been used to generate data, the percentages are presented as whole numbers, however the computations actually use the full value. This means that values presented may not always precisely correspond to the values computed when applying the percentage value presented in this report.
4. Certain computations apply a threshold of >500 tonnes.

1 http://www.wastedataflow.org/

2. Wastewater and Sewage Sludge

Four designated sewerage and water undertakers share responsibility for providing wastewater treatment capacity in Gloucestershire as follows:

- Severn Trent Water
- Thames Water Utilities
- Wessex Water Utilities
- Welsh Water

Every five years each water and sewerage undertaker submits to the water regulator, Ofwat, business plans known as Asset Management Plans (AMPs) that explain what services and infrastructure improvements each undertaker is planning to make and how these are to be funded. Ofwat sets price limits for the next five years based around the AMPs. Certainty of infrastructure provision over the medium and long terms can only be gained when future funding is secured through the asset management plan approval process. The current AMP period (known as AMP7) runs from 1 April 2020 to 31 March 2025 and does not therefore cover the whole Plan period.

Water companies also produce Water Resources Management Plans (WRMP) which cover a 25-year period to maintain sufficient water supply for customers whilst ensuring enough water remains in the environment to achieve environmental targets. The status of the WRMP for each of the sewerage and water undertakers in Gloucestershire are as follows:

- Severn Trent has published the draft version of their WRMP covering the period 2025-2085;
- Thames Water has published the draft version of their WRMP24 covering the period 2024-2075
- Wessex Water has published the draft version of their WRMP24 covering the period 2025-2080
- Welsh Water has published the draft version of their WRMP covering the period 2025-2050

While wastewater treatment plants are considered to be waste developments and therefore planning applications relating to their provision are handled by the WPA, the assessment of the need for future wastewater management is managed through the asset management plan process informed by requirements for improvements in the water environment regulated by the Environment Agency. Therefore, PPG advises that early discussions take place between local planning authorities and water and sewerage undertakers, so that proposed growth and environmental objectives, set out in the AMP's, are reflected in local plans. This in turn should help ensure that the necessary infrastructure is funded through the water industry price review mechanism regulated by Ofwat.

There are two aspects of wastewater treatment that are addressed:

1. The provision of capacity to treat wastewater itself; and
2. the provision of capacity to manage the resultant solid wastes (sewage sludge) that arise from the treatment process.

Each is covered in the following sections.

2.1 Wastewater Treatment Capacity

The Gloucestershire Waste Core Strategy Technical paper on *Sewage Treatment Facilities*[2] reported that:

"…the water utility companies have not identified any major issues with sewage treatment in Gloucestershire."

The Waste Core Strategy (2012) concluded that:

> *"Given the current level of provision and the relatively small amounts of waste managed across these waste streams no additional capacity is required. In relation to waste water, future demand associated with new housing and employment growth is at present uncertain due to the proposed abolition of the draft Regional Spatial Strategy (RSS). For this reason a criteria-based approach is considered appropriate."*

2.2 Management of Sewage Sludge

Sludge resulting from the treatment of wastewater is termed sewage sludge. This section looks at the current capacity of wastewater treatment works for the management of sludge arising in Gloucestershire and possible requirements for future capacity.

Update

The WDI 2021 shows that a total of 125,535 tonnes of sewage sludge (EWC code 19 08 05 '*sludges from treatment of urban waste water'*) from Gloucestershire was managed at permitted Waste water Treatment Works (WwTW) reporting through the WDI. Of this the majority (100,005 tonnes) was managed within Gloucestershire at the Netheridge Sewerage Treatment Plant in Gloucester[3] operated by Severn Trent Water[4]. The site's environmental permit allows it to manage up to c499,500 tonnes per annum for either anaerobic digestion or dewatering excluding sludge arising within the works itself[5].

The remainder of Gloucestershire sludge is managed outside Gloucestershire, at four facilities as shown in Table 1.

[2] Waste Core Strategy. Technical Paper WCS-H Sewage Treatment Facilities (January 2008).

[3] The Waste Core Strategy also refers to STW at Hayden nr Cheltenham. While the site operates under environmental permit EP3395CC, no inputs to this site were reported in the WDI 2021.

[4] This site also received landfill leachate and other sludges from various WPAs as discussed in Section 2.4.

[5] Netheridge Sewage Treatment Works. Permit number EPR/HP3095CT Notice of variation August 2017. https://www.gov.uk/government/publications/gl2-5lf-severn-trent-water-limited-environmental-permit-issued

Table 1: Principal permitted sites for Gloucestershire sewage sludge outside Gloucestershire
Source: WDI 2021

Facility WPA	Operator	Facility Name	Tonnes Received
Swindon	Thames Water Utilities Ltd	Swindon Sewage Treatment Works	10,865
Bristol City	Wessex Water Services Ltd	Bristol Sewage Treatment Works	8,285
Wiltshire		Trowbridge Sewage Treatment Works	5,424
BaNES		Keynsham Sewage Treatment Works	734

2.3 Sludge Storage Exemptions

Review of the Environment Agency exempt site listing for 2021 indicates that Severn Trent Water, Wessex Water, Welsh Water and Thames Water Utilities has 2,979 exemptions registered under the following exemption from permitting:

S3: Storing sludge at a place where it is to be used in accordance with the Sludge (Use in Agriculture) Regulations 1989[6].

This exemption allows up to 1,250 tonnes of sludge to be stored at each site at any one time. Material may be stored for up to 12 months before being applied to agricultural land as a fertiliser in accordance with Sludge (Use in Agriculture) Regulations 1989 & associated best practice guidance.

None of the 2,979 S3 exemptions registered have addresses located in Gloucestershire.

It should however be noted that these exemptions only provide interim storage for the sludge coming from WwTWs prior to application so are complementary, rather than alternative to, wastewater sludge treatment capacity itself.

2.4 Inputs of Other Waste to Wastewater Treatment Works in Gloucestershire

WwTW can provide a valuable function in managing wastes other than wastewater, that arise in liquid and sludge form such as septic tank emptyings. WwTW that receive such waste require an environmental permit. Review of the data presented in the WDI 2021 indicates that Netheridge Sewage Treatment Facility in Gloucestershire is permitted to receive and treat waste other than wastewater and sludges, with some going to an anaerobic digestion (AD) plant on site. Inputs delivered are shown in Table 2.

[6] There are also 2 exemptions registered under T21: recovery of waste at a waste water treatment works. Recovering waste, such as sludge from a septic tank or cesspool, which needs further treatment at a waste water treatment works.

Table 2: Inputs to Netheridge Sewerage Treatment Plant in Gloucestershire >500 tonnes (excluding EWC code 19 08 05)

Source: WDI 2021

Waste Code	EWC Waste Description	**Total Tonnes**
19 07 03	Landfill leachate	50,235
16 10 02	Liquid waste	16,737
02 07 04	Materials unsuitable for consumption or processing	11,680
20 03 04	Septic tank sludge	7,243
20 03 99	Municipal waste	5,686
02 03 04	Materials unsuitable for consumption or processing	4,490
19 02 06	Sludges from physico/chemical treatment	798
19 06 03	Liquor from anaerobic treatment of municipal waste	660
02 07 05	Sludges from effluent treatment	630
02 03 01	Sludges from washing, cleaning, peeling, centrifuging and separation	548
	Total	**98,706**

Conclusion

Having reviewed the evidence, ongoing consultation with the Water Utility companies will be necessary to determine what if any provision for additional capacity for management of this waste stream may need to be included in any update of the Gloucestershire Waste Local Plan.

3. Agricultural Waste

3.1 Context

The Waste Management (England and Wales) Regulations 2006 brought agricultural waste under legislative control for the first time. Prior to this a significant proportion was managed on farms by burning or deposit into farm tips. This became illegal under the 2006 Regulations.

In advance of the introduction of the regulations a number of research projects were undertaken in an attempt to establish quantities and composition of arisings from this stream and understand management arrangements in place at the time with a view to identifying management needs at national level:

- 1998 survey reported in a 2001 Environment Agency report[7]
- Agricultural Waste Survey reported in a 2003 Environment Agency report

These remain the most current sources of data available for the stream as a whole and therefore continue to be relied upon when seeking to generate local estimates for planning purposes.

Following the introduction of the regulations, certain agricultural waste is considered more likely to be managed in the same way as the commercial and industrial waste stream, thus placing some additional capacity requirements on the management network that manages this stream.

In order to identify whether waste from agricultural sources needs separate consideration in the Plan, the following three aspects have been considered:

1. The nature of different agricultural wastes;
2. the likely current level of arisings;
3. the way in which the arisings are managed.

3.2 The Nature of Different Agricultural Wastes

To be regarded as agricultural, waste must have been produced on a 'farm' in the course of 'farming'. Therefore, waste arising from activities that happen to be located on a farm, such as crop processing for food consumption, would fall outside this definition and be considered as commercial and industrial waste.

Agricultural waste takes both 'natural' (or organic) and 'non- natural' forms.

Natural Agricultural Waste Arisings

This is the predominant waste stream produced by the sector and the most commonly produced natural waste are wastes from livestock farming such as slurries and manure. In the UK, if manures and slurries are used as a fertiliser on agricultural land they are technically not seen as a controlled waste and are excluded from waste management regulation (although there are controls on the application). Since natural wastes are outside formal control it is considered that they are unlikely to

[7] Environment Agency (2001). Towards Sustainable Agricultural Waste Management. Environment Agency R&D Technical Report P1-339. https://www.gov.uk/government/uploads/.../geho0003bieo-e-e.pdf

enter the formal waste management system which needs to be planned for[8]. Therefore, this report focuses on non-natural waste arisings. Non-natural waste arisings may include organic waste such as crop residues.

Non-Natural Agricultural Waste Arisings

'Non-natural' agricultural waste is waste other than 'natural' organic waste arising from farming activities. This includes discarded pesticide containers, plastics, tyres, batteries, clinical waste, old machinery, waste oil and packaging waste. The only recognised source of national estimates for arisings of non-natural agricultural waste available is the 2001 Environment Agency Report entitled 'Towards Sustainable Agricultural Waste Management'. This presents estimates of arisings down to regional level for 1998. For the South West region as a whole, the report estimates that approximately 55,612 tonnes of non-natural agricultural waste was produced on an annual basis.

3.3 Management Options

The 2006 DEFRA 'Waste Minimisation Manual: A Practical Guide For Farmers & Growers'[9] identifies three principal routes for managing agricultural waste as follows:

1. Remove waste from the farm and deliver to an appropriately permitted facility.
2. Apply to the Environment Agency for a permit to manage certain waste on-farm[10].
3. Register an appropriate exemption to recover or dispose of some waste on-farm.

Each route is considered below.

Delivery to a permitted facility

This route would mean that any waste produced will be recorded at the permitted facility and hence reported through the WDI. Agricultural waste is coded under EWC 01 and EWC codes 02 01. In the WDI 2021 this amounted to c49,500 tonnes arising in Gloucestershire.

Applying for a permit

Where agricultural waste is being managed on a farm in sufficient quantities or on an ongoing basis an environmental permit may be required. Where a permit is granted by the Environment Agency the quantities of waste managed through such facilities would be reported through the WDI and hence captured for the purposes of quantifying this waste stream. Incinerators used to burn only animal carcasses or parts of carcasses, must be approved by the farm's local authority. Permitted facilities may also require express planning consent.

Registering an exemption

Typical exemptions that farmers apply for include the ability to burn waste in the open (D7), spreading waste to benefit agricultural land (U10) and the use of waste in construction (U1), which covers the use of waste hardcore to maintain farm tracks and roads. However, these exemptions may also be used to cover activities taking place on farmland involving waste from non-agricultural

[8] It should be noted that some on farm waste management facilities such as lagoons and AD plants may make provision for this waste stream, sometime in conjunction with other wastes counted under other streams.

[9] DEFRA 2006 Product code PB 11674

[10] Intensive farming units such as pig or poultry farms are subject to environmental permitting.

sources. The specific exemptions that relate solely to the management of agricultural waste are as follows:

- Deposit of agricultural waste consisting of plant tissue under a Plant Health notice.
- Treatment of sheep dip for disposal.
- Treatment of non-hazardous pesticide washings by carbon filtration for disposal.
- Spreading pig and poultry ash mixed with manure on farmland.

3.4 Agricultural Waste managed at Permitted Sites

The Gloucestershire Waste Core Strategy (2012) did not update agricultural arisings on the basis that it took the position to propose no specific provision be made for agricultural waste given 'non-natural' agricultural waste represents less than 1% of waste managed in Gloucestershire[11].

Update

Analysis of the WDI 2021 identified c49,500 tonnes of waste from agricultural sources in Gloucestershire was managed at permitted sites in 2021. This was composed of c41,500 tonnes of non-natural waste and c8,000 tonnes of natural waste. The primary recipients of the waste are displayed in Table 3 below.

Table 3: Permitted Sites Receiving Agricultural Waste from Gloucestershire (>500 tonnes)
Source: WDI 2021

WPA	Site Name	Anaerobic Digestion	Anaerobic Digestion	Composting	Metal Recycling	Grand Total
Gloucestershire	Gilders Yard	0	0	0	864	**864**
	Hill Farm	10,656	0	0	0	**10,656**
	Plusterwine AD	30,479	0	0	0	**30,479**
	Rose Hill Farm	0	0	1,368	0	**1,368**
Total Managed in Plan Area		**41,135**	0	**1,368**	**864**	**43,368**
Somerset	Lambrook AD Plant	**0**	3,077	0	0	**3,077**
	Swang Farm AD Facility	**0**	1,234	0	0	**1,234**
Wiltshire	Park Grounds Farm	0	0	590	0	**590**
Total Managed outside Plan Area		0	**4,311**	**590**	0	**4,901**
Grand Total		**41,135**	**4,311**	**1,958**	**864**	**48,269**

Based on the above the total quantity of agricultural waste arising that may require offsite management would be c48,500 tonnes per annum.

[11] It is unclear how this has been determined in the WCS evidence base.

3.5 Agricultural Waste Managed via Exempt Activities

Due to the imprecise and non-specific nature of exemptions it is not possible to attribute tonnages managed through these routes. However, it may be reasonable to assume that some of the waste managed in this way eventually ends up at permitted facilities and the tonnages of waste are therefore reported in the WDI. It may have been mixed with non-agricultural waste as part of a collection round and is therefore never declared as coming from agricultural sources. Due to this, no attempt to calculate the total agricultural waste managed at exempt sites has been made.

Conclusion

The estimated agricultural waste arising from Gloucestershire in 2021 that may require formal management is c48,500 tonnes. The tonnages managed through exemptions may add to the arisings figure but the quantities are unknown and it is likely that some is reported in the WDI at 'next step' sites. Given the uncertainty of data and the apparent provision the position taken in the Waste Core Strategy (2012) i.e. to not plan for additional management capacity is considered to remain justified.

4. Low Level Radioactive Waste

4.1 Introduction to Radioactive Waste

Solid radioactive waste is divided into three principal categories (and a sub category) according to its level of radioactivity. These categories are:

- **High-level radioactive waste (HLW)** is waste in which can generate significant heat as a result of its radioactivity, and so this factor has to be taken into account in the design of storage or disposal facilities.
- **Intermediate level radioactive waste (ILW)** has lower levels of radioactivity than HLW and does not generate sufficient heat for this to be taken into account in the design of storage or disposal facilities.
- **Low level radioactive waste (LLW)** is radioactive waste having a low radioactive content. LLW makes up more than 90% of the UK's radioactive waste by volume but contains less than 0.1% of the total radioactivity. Within the definition of LLW, there is a sub-classification, known as Very Low Level radioactive waste (VLLW).
    - Very low level waste (VLLW) is defined as either low volume VLLW or high volume VLLW. The principal difference between the two definitions is the need for controls on the total volumes of high volume VLLW being deposited at any one particular landfill or other waste management facilities.

4.2 Context in Gloucestershire

> *"In Gloucestershire the main facility managing radioactive waste is Berkeley Power. Station which is used for the long-term storage of the on-site radioactive waste associated with the de-commissioning of the facility."*

- Waste Core Strategy 2012

4.3 Policy Relevant to Gloucestershire Arisings

The primary national Government policy document relevant to Cumbria due to the presence of nuclear sector facilities is the 'UK Strategy for the Management of Solid Low Level Waste from the Nuclear Industry' published in February 2016. The three main strategic themes include:

- the application of the waste hierarchy;
- the best use of existing LLW management assets;
- the need for new fit-for-purpose waste management routes

Nuleaf's (Nuclear Legacy Advisory Forum) 'Advice on Approaches to Radioactive Waste Management in Local Plans' published in January 2020 is also relevant for advice on planning policies on lower-level radioactive waste which states:

"*Local Plans that include waste policies should state clearly how/where radioactive waste arising within the area will be managed, with appropriate engagement under the Duty to Co-operate.*

National policy also requires that communities take more responsibility for their own wastes. In accordance with this, the following potential options could be considered in drawing up local planning authority policy for radioactive waste disposal:

- *For nuclear industry wastes, the preferred location for LALLW/VLLW disposal may be within the nuclear site where it arises. Alternatively, where there is an aspiration for a particular end state that radioactive waste disposal would conflict with, and de-licensing, the preferred location is likely to be off site.*
- *If those assessments do not identify any practicable solutions then the use of existing or proposed conventional sites within the WPA's area should be considered; or,*
- *If none of those sites has the potential to dispose of those wastes, and the preferred option is for such wastes to go to other areas, the Duty to Cooperate will be relevant and the policy would need to be developed through engagement with the relevant WPA(s).*"

4.4 Low Level Radioactive Waste from Non-Nuclear and Nuclear Sources

Nature

The majority of LLW arises from the operation of nuclear power stations, nuclear fuel reprocessing facilities, and also from the decommissioning and clean-up of nuclear sites, all examples of LLW from nuclear sources. Given it hosts former nuclear power station at Berkeley, Gloucestershire deals with LLW from nuclear sources, However, the station has stopped generating and is going through decommissioning, with the LLW produced being stored on-site.

Non-Nuclear Sources

Non-nuclear sources of radioactive waste include hospitals, the pharmaceutical sector, and research and education establishments, all of which use radioactive materials which ultimately leads to the generation of radioactive waste. Individually these sources generate relatively small volumes of radioactive waste. Further information regarding these sources is provided below.

- **Hospitals** - Solid low level radioactive wastes arise as a result of traces of radiopharmaceuticals in used syringes, needles, vials from which radiopharmaceuticals have been withdrawn and absorbent or protective materials (e.g. swabs, dressings, sheets and plastic film) which may be contaminated with small amounts of radiopharmaceutical. Traditionally, most hospital waste has been designated as clinical waste, much of which is incinerated. However, hospitals are now segregating wastes at source, distinguishing between that waste that requires management as clinical and that which can be managed as 'general' waste. This may result in some LLW being managed as general waste.
- **Industry** - The pharmaceutical industry carries out drug and technology development in specific areas of disease research and, in doing so, makes wide use of radiopharmaceuticals. Solid LLW from the pharmaceutical industry comprises general laboratory plastics, vials, sharps (i.e. needles and blades), gloves and any material which may be contaminated. LLW from biotechnology companies includes equipment to count the radioactivity, gloves, protective overalls and vials, and the waste is treated as either clinical or general waste
- **Research** - Radioactive tracers are used in universities, colleges and other research laboratories, to study the incorporation of chemical compounds into cells and organisms and

also to study their transfer and metabolism. LLW arising at medical schools and biomedical research laboratories is similar to that from hospital laboratories and the pharmaceutical and biotechnology industries. The waste typically includes disposable plasticware, sample tubes, paper and plastic coverings, paper tissues, and organic liquids that are used to count certain types of radioactivity (called scintillation fluids). Agricultural and animal research will result in rather more bulky wastes (for example plant matter and animal bedding).

- **Contaminated Land** - Whilst waste arisings from the remediation of land contaminated with radioactivity from non-nuclear sources are potentially significant in terms of volumes, their ad hoc nature makes it difficult to undertake any meaningful long term planning for disposal of associated soils. In its strategy, the Government does not therefore expect planning authorities to make specific provision for this within their planning frameworks. However, it does consider it prudent for waste planning authorities to make reference in their planning documents to the possibility that radioactively contaminated soil might arise where historical activities involving radioactive sources may have taken place, and that such waste might require disposal to specially authorised landfills. Given Gloucestershire hosts a nuclear facility, it is recommended such a clause be included.[12]

4.5 Management of VLLW and LLW

Very Low Level Waste (Exempt Waste)

A site producing or managing less than 50 m^3 of VLLW per year is classed as a low volume VLLW source and as such is exempt from reporting quantities of waste produced and managed. VLLW from such sources is not required to be managed separately and so will generally be managed in the same manner as general waste produced on the source site. As a result, any landfill or incinerator in the UK may accept small volumes of VLLW mixed in with the other wastes. On that basis it may be assumed that any waste management facility receiving mixed waste might receive low volumes of VLLW depending on whether source sites fall within their catchment. However, VLLW is rarely (if ever) declared as such in any waste returns submitted so there are no specific records of its management to draw on. The LLW strategy states that Government considers that the present arrangements for low volumes of exempt VLLW are satisfactory and does not expect waste planning authorities to make specific provision for the management of VLLW in their waste plans.

Low Level Waste

When considered on its own, the very small quantity of LLW is insufficient to drive the provision of dedicated management facilities via the market. Therefore, the LLW Strategy concludes that producers of these wastes will nearly always have to rely on waste management networks provided for other large volume wastes. This can be problematic as the public perception of the risks associated with the management of LLW can deter waste facility operators from providing such a disposal service.

Most disposal of LLW requires a permit to be held by both the waste producer and the operator of the waste management facility that receives it. LLW can go either to a landfill as a 'controlled burial', the national Low Level Waste Repository (LLWR) located in Cumbria at Drigg, or may be dealt with by

[12] While the adopted WCS acknowledges that some LLW and VLLW is managed at Gloucestershire's existing landfill sites, it concludes there is no need to include a specific policy dealing with radioactive waste management given that a more general policy exists relating to provision of additional landfill capacity. (See para. 4.158 and 4.157)

incineration (with or without energy recovery). To extend its life, use of the national LLWR is reserved for particular types of LLW, so LLW disposal usually takes place at specially authorised facilities used for the management of other types of waste. Unlike the network of facilities available to take VLLW there are considerably fewer facilities across the UK that currently take LLW. While operators of appropriate facilities may apply to take LLW at any time, in England there are currently only three landfill sites granted permits to do so. These are shown in Table 4. The closest site to Gloucestershire is the East Northants Resource Management Facility (ENRMF), so current and future arrangements at this site may be of greatest relevance. The ENRMF has development consent including provision for disposal of LLW up to 2026 and a DCO application to extend its capacity and life was granted in January 2023. However, there is nothing to indicate that any LLW that would not be managed as VLLW is produced in Gloucestershire.

Table 4: Landfill Sites Permitted to Receive LLW in the UK

Site Name	Operator	Waste Type	Source Specific	Host WPA
East Northants Resource Management Facility	Augean South PLC	LLW	Waste mainly generated from the decommissioning and cleanup of nuclear industry sites[13]	Northants
Clifton Marsh	Sita (Lancashire) Ltd	LLW	Small quantities of lower activity low level radioactive wastes[14].	Lancashire
Lillyhall Landfill Site	Waste Recycling Group Ltd	High Volume -VLLW	No more than 26,000 m^3 of HV-VLLW per year and if the landfill remains operational until 2031 no more than 582,000 m^3 of HV-VLLW in total.[15]	Cumbria

4.6 Planning for the Management of LLW

The LLW strategy exhorts producers of LLW to work with planning authorities, to ensure that such wastes may be effectively handled through the preparation of local plans and in determining planning applications. It also suggests that any waste management plans produced by LLW producers should take account of the proximity principle alongside other considerations. It states that:

> "*Waste planning authorities should consider how to manage LLW and VLLW arising in their areas as part of the preparation of their local waste plans. They should seek advice from waste producers and the environment agencies to ensure that the waste is being sent to a suitable waste management facility. If necessary and feasible, they should work with other waste planning authorities to share facilities.*" [16]

[13] https://www.augeanplc.com/enrmf-planning/

[14] Sita Ltd 2020 http://www.sita.co.uk/

[15] Environment Agency. 2011. Environmental Permitting (England and Wales) Regulations 2010 Decision Document. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/303034/WRG_Decision_Document.pdf

[16] LLW Strategy key point page 18

4.7 LLW - The Proximity Principle

The LLW strategy recognises that planning for the disposal of VLLW and LLW by waste producers involves balancing regulatory and policy requirements with what appropriate disposal routes are actually available. In the case of most low volume VLLW from non-nuclear sources, its management route/fate is purely dependent on that of general waste with which it is mixed at the point of production i.e. waste producers have little influence on choice of destination at which the waste is ultimately managed/disposed unless they segregate it at source.

In the case of deciding on management/disposal routes for LLW, the LLW strategy states that the Government wishes to see “appropriate and explicit consideration” of the proximity principle. “Appropriate and explicit consideration" means that proximity must be a feature of any options assessment process which supports a proposed waste management plan. "Appropriate” consideration means that the proximity principle will assume a different importance in an options assessment for, say, a site producing large volumes of contaminated steel, for which only a limited number of decontamination facilities are available, compared to a hospital generating low volumes of radioactive waste suitable for incineration or landfill.

4.8 The LLW Strategy also states that

> "*Communities which benefit from the beneficial uses of radioactive materials (including direct benefit such as the use of radiopharmaceuticals, and indirect benefits such as contributions to a local economy from commercial bodies using radioactive materials) should take a share in the responsibility for managing the radioactive wastes which inevitably arise from their use, where possible*"

It does however go on to recognise that "*...each and every local authority cannot necessarily be self-sufficient in the matter of waste management*." [17]

[17] LLW Strategy key point page 17

4.9 Production and Management of LLW in Gloucestershire

The Waste Core Strategy 2012 did not update LLW arisings for Gloucestershire.

A review of radioactive source permits records granted by the Environment Agency indicates that there are 10 authorisations held by 8 entities within Gloucestershire as shown in Table 5 below.

Table 5: Radioactive Source Authorisations held within Gloucestershire
Source: Environment Agency Public Register accessed December 2022

Activity	Entity	Date Granted	Location
Keeping & Use of Radioactive Materials and Disposal of Radioactive Waste (G)	Gloucestershire Hospitals NHS Foundation Trust	22.02.2013	Gloucestershire Royal Hospital, Great Western Road, Gloucester, GL1 3NN
	Cavendish Nuclear Limited	27.02.2014	A11/A12, Gloucestershire Science & Technology Park, Berkeley, GL13 9FB
	Cobalt Health	05.05.2015	Linton House Clinic, Thirlestaine Road, Cheltenham, GL53 7AS
	Independent Vet Care Limited	18.02.2014	The Veterinary Hospital, Bradley Green, Wotton-under-Edge, Gloucester, GL12 7PP
	Gloucestershire Hospitals NHS Foundation Trust	25.10.2007	Cheltenham General Hospital, Sandford Road, Cheltenham, GL53 7AN
Keeping and Use of Radioactive Materials (E)	University of Gloucestershire	21.08.2003	Francis Close Hall, Swindon Road, Cheltenham, GL50 4AZ
Keeping & Use of Radioactive Materials and Disposal of Radioactive Waste (F)	Bourton Vale Equine Clinic Limited	01.04.2018	Bourton Vale Equine Clinic, Wyck Road, Lower Slaughter, Cheltenham, GL54 2EX
	Wood Environment and Infrastructure Solutions UK Limited	01.04.2018	Bonds Mill Estate Limited, Bonds Mill, Bristol Road, Stonehouse, GL10 3RF
	CVS (UK) Limited	12.10.2022	B & W Equine Hospital, Breadstone, Berkeley, GL13 9HG
Keeping & Use of Radioactive Materials and Disposal of Radioactive Waste (H)	Gloucestershire Hospitals NHS Foundation Trust	01.04.2018	Cheltenham General Hospital, Sandford Road, Cheltenham, GL53 7AN

These permits are issued to establishments which use radioactive substances and it is possible therefore, that as part of their activities, they will generate some LLW or VLLW requiring management/disposal offsite.

In addition to the establishments authorised to hold radioactive sources listed in Table 5, there are a number of entities that hold permits for the disposal of radioactive waste within Gloucestershire. These are referred to as grade H and O permits. There is one entity holding one of these permits in Gloucestershire and this is the former nuclear power station at Berkeley.

Conclusion

This review has found that there are a number of holders of radioactive sources waste and a number of permitted sites managing radioactive waste by disposal in Gloucestershire. However, in the absence of data on quantities in relation to the authorisations, it is not possible to generate meaningful estimates of arisings of LLW in Gloucestershire.

5. Overall Conclusion

Review of the above data sources allows the following conclusions to be reached about the need to plan for 'other wastes' in the Gloucestershire Waste Local Plan:

1. Wastewater and the associated sludge appear to be catered for adequately through arrangements made by Severn Trent Water, Thames Water, Wessex Water and Welsh Water the statutory sewerage undertakers. It is recommended that these undertakers be given specific opportunity to comment on the findings of this report and draft emerging policy positions to ensure that the proposed policies are sufficiently flexible to allow appropriate consideration of any proposals related to the expansion of wastewater and sludge treatment capacity that may come forward.

2. Agricultural waste – Gloucestershire is not considered to generate sufficient quantities of waste that would warrant specific separate provision assuming the continuation of the existing arrangements including the exemption regime.

3. Radioactive waste – This review has found a limited number of permitted sources of non-nuclear radioactive materials within Gloucestershire and a single site permitted to dispose of radioactive waste. This strongly suggests that there is no critical mass of material requiring specialist capacity provision that needs to be planned for within the county. The radioactive waste produced from the decommissioning of Berkeley power station is being temporarily stored on-site for which Magnox is expected to make its own management arrangements in the future.