Gloucestershire Waste Management Need and Infrastructure Capacity Assessment 2022

Management Requirements for Hazardous Waste in Gloucestershire to 2041

Report: Final Issue

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Abbreviations

APCr	Air Pollution Control residues
C & I	Commercial & Industrial Waste
C, D & E	Construction, Demolition & Excavation Waste
CFC	Chlorofluorocarbon (gases)
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency
ELVs	End of Life Vehicles
EWC	European Waste Catalogue
HWI	Hazardous Waste Interrogator
HWRCs	Household Waste Recycling Centres
IED	Industrial Emissions Directive
LACW	Local Authority Collected Waste
MRS	Metal Recycling Sites
PPG	Planning Practice Guidance
PI	Pollution Inventory
SNRHW	Stable non-reactive hazardous waste
WDF	WasteDataFlow
WDI	Waste Data Interrogator
WEEE	Waste Electrical & Electronic Equipment
WMNICA	Waste Management Need and Infrastructure Capacity Assessment
WPA	Waste Planning Authority
WTS	Waste Transfer Station

Glossary of Terms

Commercial Waste	Waste from factories or premises used for the purpose of trade or business, sport, recreation or entertainment.
Construction, Demolition & Excavation Waste	Waste arising from construction and demolition activities, including excavation during construction, mainly consisting of inert materials such as soils, stone, concrete, and brick. This waste stream also contains non-inert elements such as wood, metals, plastics, cardboard and plasterboard
DEFRA	The UK Government department responsible for developing national waste management policy.
Duty to Cooperate	The Duty to Cooperate is a legal test that requires cooperation between local planning authorities and other public bodies to maximise the effectiveness of policies for strategic matters in Local Plan making.
End of Life Vehicles	Vehicles classed as waste having been declared as no longer usable and for which a Certificate of Destruction has been issued by DVLA. Deemed hazardous until hazardous components removed via depollution processes.
Environment Agency	The body responsible for the regulation of waste management activities through issuing Environmental 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 advice.
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).
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 it 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 its characteristics.
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".
Household Waste Recycling Centres	A facility that is available to the public to deposit waste not collected through kerbside collection (otherwise known as a civic amenity site).
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).

Other Recovery	Subjecting waste to processes that recover value by means other than recycling and composting – mainly thermal treatment to recover energy.
Recovery	Subjecting waste to processes that recover value including recycling, composting or thermal treatment to recover energy.
Recycling	The sorting and separate storage of materials extracted from the waste stream for reprocessing either into the same product or a different one.
Vehicle depollution	Removal of hazardous components from End of Life vehicles. May only take place at authorised facilities permitted to do so.
Waste Planning Authority (WPA)	The local authority responsible for waste development planning and control. In this case Gloucestershire Council.
Waste Transfer Station	A site to which waste is delivered for bulking prior to transfer to another place for further processing or disposal.
Waste Electrical and Electronic Equipment (WEEE)	Waste from electrical and electronic equipment which includes a large range of devices such as computers, fridges and mobile phones at the end of their life.

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:

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 is concerned with updating the hazardous waste baseline for 2021 and assessing its projected management requirements to 2041. Due to the variable nature of hazardous waste and differing management requirements, forecasts have been generated on a waste type basis.

The term ‘hazardous waste’ is used to describe waste that possess properties considered to pose a threat to human health and/or the environment such as toxicity, flammability, corrosiveness and carcinogenicity. Hazardous waste arises from different sources so does not occur as a discrete waste stream, being more a collection of different materials, which are generally collected and managed separately according to their differing hazardous properties. For example, fridges containing CFC gases and cathode ray tubes used in TV and computer monitor screens are classed as hazardous, as are oily water, interceptor wastes and undepolluted scrap (‘End of Life’) vehicles. Each of these waste types often require management by distinctly different methods and hence provision of different types of facilities regardless of their origin. Hence, the hazardous component of each of the main origin streams i.e. Construction, Demolition & Excavation (C, D & E), Commercial and Industrial (C&I) and Local Authority Collected Waste (LACW) are considered together in this report, and in doing so the quantity arising in each is deducted from the estimate of the origin stream arisings reported elsewhere in order to avoid double counting.

2. Calculating a Baseline Arisings Estimate

To generate a baseline estimate of hazardous waste arising in Gloucestershire the following datasets have been accessed:

1. The Environment Agency (EA) Hazardous Waste Interrogator (HWI) 2021[1] - movements.
2. The EA Waste Data Interrogator (WDI) 2021[2] – inputs to permitted management sites.
3. The EA Waste Data Interrogator 2021 – outputs from permitted management sites.
4. The EA Pollution Inventory Site outputs 2021 - waste from significant industrial sites.

Notably while the HWI always specifies the waste origin and destination by Waste Planning Authority (WPA) it does not identify the specific facility at which the waste has been managed, whereas the WDI may only report by originating region but does report inputs and outputs by individual facility. Hence both datasets have been accessed to generate a comprehensive picture of fates of Gloucestershire's hazardous waste.

The relationships between the datasets are illustrated in Figure 1 and the findings derived from each dataset are considered below.

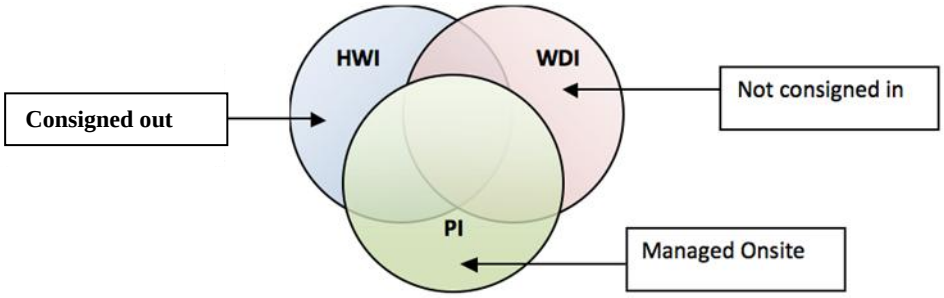

Figure 1: Relationship between Datasets for Hazardous Waste

2.1 The EA Hazardous Waste Interrogator (HWI) 2021

Legislation requires that the relevant waste regulation authority[3] be notified when hazardous waste is moved. The notification takes the form of a consignment note that details the quantities and destination of the waste. This means that the following movements of hazardous waste are recorded and reported to the relevant regulatory body:

- From producer sites directly to disposal/treatment facilities;
- from producer sites to transfer facilities for bulking up and onward management; and,
- from treatment facilities to final disposal sites.

This data is then aggregated by the Environment Agency and made available in the HWI that is published on an annual basis with a delay of c9 months.

[1] This reports data for 2020 but was published in 2021 and is the latest data available

[2] As in footnote 1

[3] For England this is the Environment Agency.

The reporting method means that the HWI dataset may be incomplete for the following reasons:

- Consignment notes are not issued when hazardous waste is managed on the site of its production by the producer or same operator.
- Where the producer of hazardous waste is a householder the requirement to consign does not apply. Therefore, where the receiving site operates under an Environmental Permit, (and reports through the WDI[4]), waste will only either be recorded on arrival, or when it is removed. For example, undepolluted End of Life Vehicles (ELV), which are classed as hazardous waste, will often not be consigned from their origin when being scrapped because the owner of a vehicle is not required to do so and hence this initial movement is not recorded in the HWI. However, it should be recorded as hazardous waste on arrival at the vehicle de-pollution site by the permit holder, as an input of waste to a site with an Environmental Permit, and it is then reported through the WDI. Another example is any hazardous waste such as a lead acid batteries brought to a household waste recycling site (HWRC) will not be consigned in, but will normally be consigned out by the operator/permit holder.

Both of the above circumstances can result in under-reporting of hazardous waste arisings through the HWI. However, this may be balanced by aspects of the hazardous waste consignment process that allows for the possibility of over-reporting. For example, if waste is moved to an intermediate management site within Gloucestershire and then moved on to a further site it will be consigned twice, when leaving its origin and then when leaving the intermediate site, and so double counted. Also, the person consigning hazardous waste may not have facilities to precisely measure the quantity of waste they are passing on and so may estimate the amount per load. This may result in a discrepancy between the quantity recorded as having been consigned from the source e.g. a half-full drum may be recorded by the drum's total capacity, and the quantity actually recorded as having been received at the waste management site which would normally have a reliable measurement method such as a weighbridge.

The Agency HWI 2021 indicates the following:

- In 2021 58,448 tonnes of hazardous waste (of all types) were produced in Gloucestershire;
- Of this, 16,116 tonnes were managed in Gloucestershire; with the difference (42,332 tonnes) managed outside Gloucestershire i.e. exported.
- Conversely 22,530 tonnes of hazardous waste were imported to Gloucestershire for management.

To address the limitations associated with the HWI outlined above, and ensure use of the best available data as required by national Planning Practice Guidance (PPG), data from the WDI and the Pollution Inventory (PI) has also been consulted.

[4] Some permitting exemptions allow the receipt of certain hazardous wastes, and these sites do not report through the WDI.

2.2 The EA Waste Data Interrogator (WDI) 2021

While one might expect the values for inputs to permitted intermediate sites as reported through the WDI to correspond to outputs from those sites, there can be discrepancies. These can be attributed to a lack of comprehensive reporting of inputs to certain facilities, such as ELVs received at vehicle depollution sites which undergo depollution, and are rendered non-hazardous in the process, leaving a much smaller tonnage of hazardous waste to go for ongoing management. Comparing the WDI output value with the input value can therefore reveal such discrepancies. In some cases, for the same type of hazardous waste, output values are greater than input values. In these cases, the output value may be capturing a more complete picture and hence result in a more accurate estimate of arisings. This is considered below.

Inputs from Gloucestershire to permitted sites reporting through WDI

The Agency WDI 2021 indicates the following:

- In 2021 73,677 tonnes of hazardous waste reported as having been managed at permitted sites (both within and beyond Gloucestershire) were attributed to Gloucestershire as its source;
- of this, 27,647 tonnes were managed in Gloucestershire with the difference (46,031 tonnes) being managed outside Gloucestershire; and,
- 19,959 tonnes were imported for management in Gloucestershire.

Outputs from Gloucestershire to permitted sites reporting in the WDI

Outputs of hazardous waste from Gloucestershire permitted sites reporting through the WDI will be identified as arising within Gloucestershire (regardless of its original source) and hence may be counted towards the quantity of waste to be planned for in the Gloucestershire Waste Local Plan. For example, ELVs are classed as hazardous by virtue of the presence of oils, fluids and batteries within them. Once depolluted the ELV shell ceases to be hazardous but the extracted hazardous components will leave the depollution site as hazardous waste for onward management. Those components that arise from depollution sites operating in Gloucestershire will be reported as hazardous waste arising in Gloucestershire. This is illustrated in Figure 1.

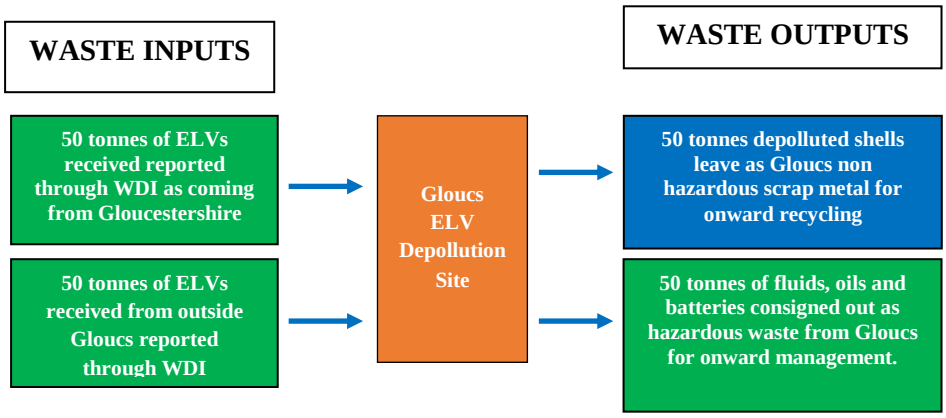

Figure 2: Illustrative Schematic of flows of ELV's to, and resulting from, an ELV depollution site

The WDI 2021 indicates that 36,090 tonnes of hazardous waste were removed from permitted sites operating within Gloucestershire.

2.3 The Pollution Inventory (PI) 2021

The EA PI captures data on waste arising from certain industrial installations, regulated under the Industrial Emissions Directive (IED)[5] permitting regime. Such installations may manage their waste onsite or send their waste for offsite management. This dataset is considered for the following reasons:

1. As previously stated, the HWI may not capture all hazardous waste arisings as waste managed on the site of production through onsite treatment doesn't need to be consigned and it may be managed onsite by a method that is recorded in the PI;
2. As noted above, both the WDI input and output datasets can be prone to underreporting by misattribution of waste. The PI does record sources of inputs and so allows for a cross check of the WDI.

A check has therefore been made of hazardous waste data for non-waste installations that report through the PI. However, this dataset did not indicate a significant tonnage of hazardous waste produced by non-waste industrial installations operating in Gloucestershire reporting through this route in 2021. Therefore, no value was taken forward.

[5] Retained EU legislation.

2.4 Summary of Headline Data

The data from the HWI and WDI shows that:

- HWI: Movements of waste arising in Gloucestershire: 58,448 tonnes.
- WDI: Input of hazardous waste arising in Gloucestershire to all sites: 73,677 tonnes.

The management import/export balance as indicated by the WDI and HWI is displayed in Table 1.

Table 1: Gloucestershire Hazardous Waste Arisings & Management Data
Blue indicates values contributing to arisings, pink indicates Gloucestershire management capacity
Source: HWI 2021 and WDI 2021

	Gloucestershire Hazardous Waste Arisings (tonnes)		Hazardous Waste Managed in Gloucestershire (tonnes)		
Data source	**Quantity Managed Attributed to Gloucestershire**	**Of which Quantity Managed outside Gloucestershire (exports)**	**Quantity Managed in Gloucestershire Attributed to Gloucestershire**	**Quantity Managed in Gloucestershire from outside (imports)**	**Total Managed**
HWI	58,448	42,332	16,116	22,530	38,646
WDI (inputs from Gloucestershire to all facilities including outputs from Gloucestershire facilities)	73,677	46,031	27,647	19,959	47,606
WDI (outputs from Gloucestershire facilities)	36,090	12,457	23,632	n/a	

Table 1 shows that more waste is recorded in the WDI as arising in Gloucestershire than the HWI input (73,677 vs 58,448 tonnes). The total amount of waste managed within Gloucestershire is greater according to the WDI than is reported in the HWI (47,606 vs 38,646 tonnes).

The HWI may be underreporting arisings due to a number of reasons. As HWI entries are not site specific, to understand the possible source of this discrepancy better it is necessary to assess the tonnages by waste code and fate. The outcome and findings of the comparison exercise for WPAs receiving 500 tonnes of more is shown in Table 2 below.

Table 2: Destination of Gloucestershire Hazardous Waste by WPA (inc Gloucs) (500t or more in either WDI or HWI)

Source: Environment Agency 2021

Deposit WPA	WDI Total (tonnes)	HWI Total (tonnes)	Hazardous Waste Management Detail
Bristol City	3,089	3,531	WEEE to MRS and bituminous mixtures containing coal tar for recovery
Derbyshire	410	1,648	Lead acid batteries for recovery
Gloucestershire	27,647	16,116	ELV's to MRS and landfill leachate for treatment and wastes marked as hazardous partly stabilised for landfill
North Somerset	5,651	6,741	Bituminous mixtures containing coal tar for recovery
Northamptonshire	5,218	5,248	Solid wastes from gas treatment for treatment (Air Pollution Control residues (APCs) from Javelin Park
Salford	802	983	Sodium and potassium hydroxide for treatment
Sandwell	3,815	1,819	ELV's to MRS and asbestos for recovery
South Gloucestershire	585	644	Various wastes all sub 100t
Surrey	2	648	Soil and stones containing dangerous substances for treatment (at Redhill Landfill)
Swindon	858	630	ELV's to MRS and infectious wastes for treatment
Walsall	1,458	1,969	Lead acid batteries for transfer
Warwickshire	1,186	598	Machining emulsions and solutions free of halogens for recovery
Wiltshire	1,909	1,755	Construction materials containing asbestos and soil and stones containing dangerous substances for landfill
Wolverhampton	13,345	9,198	Soil and stones containing dangerous substances for treatment
Worcestershire	3,880	1,252	ELV's to MRS and oils for transfer
Total	**69,854**	**52,779**	

Table 2 indicates that inputs recorded as coming from Gloucestershire in the WDI are not always being attributed to Gloucestershire in the HWI. The underreport in the HWI for Gloucestershire inputs can be attributed mainly to waste reported as managed in Gloucestershire itself with c12,000 tonnes discrepancy between the HWI and WDI. This is likely to be due to ELVs not being consigned by its owner but then being reported at the ELV de pollution site through the WDI as discussed previously.

It is also noted that Table 2 also indicates an underreport in the WDI in a few cases. This may be attributed to inputs in the WDI not being coded below regional level.

The outcome of this exercise confirms that the WDI dataset for Gloucestershire's hazardous waste arising appears to be the most comprehensive for 2021 and hence represents the 'best available' data for the purposes of forward planning for this waste stream in Gloucestershire.

2.5 Conclusions

Gloucestershire Hazardous Waste Arisings

Hazardous waste arisings attributable to Gloucestershire for 2021 have been found to be c74,000 tonnes, according to the WDI 2021. This value compares with that for 2008 of c90,000 tonnes used in the Gloucestershire Waste Core Strategy 2012.

This assessment also found that in 2021 the quantity of hazardous waste arising within Gloucestershire exceeded the quantity of hazardous waste actually managed within Gloucestershire, by a significant margin - c74,000 tonnes produced vs c48,000 tonnes managed according to the WDI.

While there is no expectation in national policy that hazardous waste as a stream should be provided for on an exclusive local basis, hence the net self sufficiency principle does not apply. Reliance of some waste types on management capacity in other Plan areas can make it a 'larger than local' strategic issue under the Duty to Cooperate. This is considered in more detail in Section 5 of this report.

3. Forecasting Future Hazardous Waste Arisings

3.1 National Policy

The 2013 National Policy Statement for Hazardous Waste[6] remains the most current review of hazardous waste arisings in England. It states that arisings of hazardous waste are expected to increase for the following reasons:

- Continuing consumer demand for consumer durables containing hazardous materials.
- Increasing use of producer responsibility schemes, such as those provided for Waste Electrical and Electronic Equipment (WEEE) which require the separate collection of WEEE resulting in more hazardous items being removed from the mixed municipal waste stream, being collected separately as hazardous waste.
- Changes to the list of hazardous properties in the revised Waste Framework Directive and changes to the European Waste List, leading to increases in the amount of waste classed as 'hazardous'. There are still uses in which components that become hazardous waste may be unavoidable for the foreseeable future. For example, the use of oil in internal combustion engines.

It should also be noted that Persistent Organic Pollutants (POPs) bearing materials are being added to the POPs Regulations 2007, which will also lead to an increase in reported hazardous arisings. For example, most recently the Environment Agency has determined furniture containing PoPs to be hazardous and unsuitable for landfilling.[7]

3.2 Defining Growth Factors for Hazardous Waste arising in Gloucestershire

While nPPG advises that future hazardous waste arisings be estimated by extrapolating time series data from the HWI, reliance on historical data to establish possible future trends is not considered to be robust due to frequent changes in the definition of hazardous waste and refinement of regulatory guidance which has tended towards increasing the range and quantity of waste being classed as hazardous and thereby 'artificially boosting' quantities of arisings. That is to say the dataset for 2017 would capture a more limited range of wastes than the 2021 dataset, so if the value shown by the more recent dataset is greater this is not necessarily because quantities of the waste arising in 2017 actually increased. For example bituminous materials i.e. tarmac has been classed as hazardous in recent years.

This is evident by the values obtained from the WDI for hazardous waste produced in Gloucestershire over the past five years as shown in Table 3. Over the period 2017 – 2019 hazardous waste arisings saw a decline whilst from 2019 to 2021 reported arisings increased.

[6] National Policy Statement for Hazardous Waste: A framework document for planning decisions on nationally significant hazardous waste infrastructure Defra June 2013

[7] Environment Agency on GOV.UK website: Identify and dispose of waste containing persistent organic pollutants March 2015

Table 3: Hazardous Waste Arising in Gloucestershire Over the Past 5-data years

Source: WDI

Year	Indicated arisings
2017	93,137
2018	64,148
2019	30,095
2020	44,108
2021	73,677

These values are plotted in Figure 3 along with trendlines.

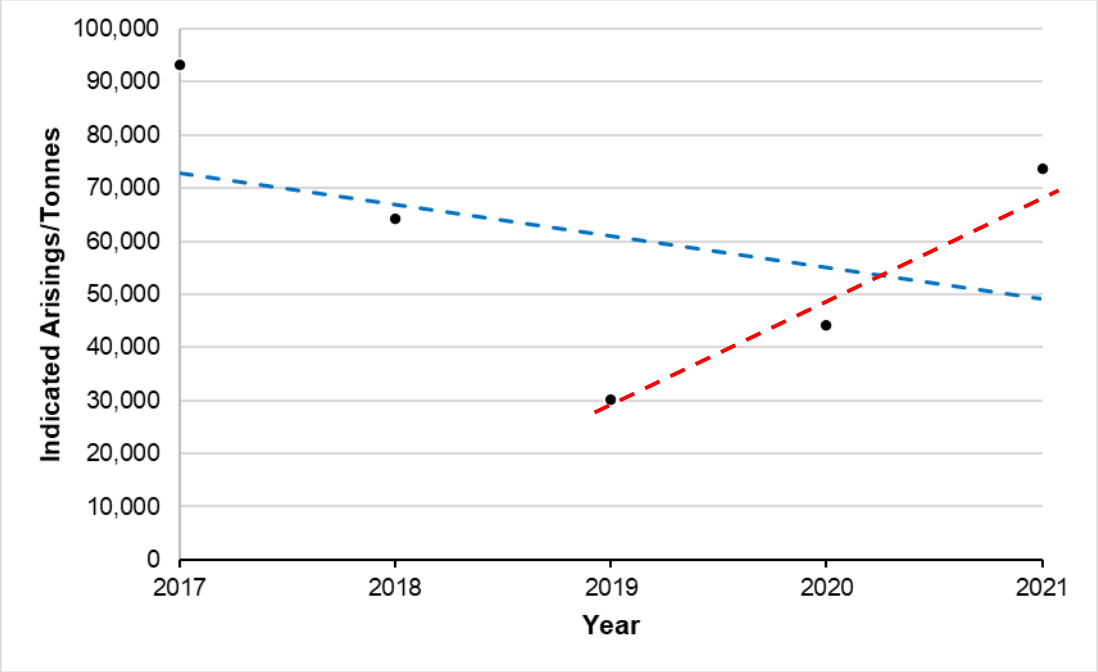

Figure 3: Hazardous Waste arising (tonnes) in Gloucestershire as recorded by the WDI (2017-2021)

The blue dashed trend line in Figure 3 is based on hazardous waste arisings over a 5-year period, which indicates a decline in arisings over time. However, when applying a trend line (red dashed line) to the arisings over the most recent 3-year period (2019-2021) this indicates a significant rise which if extrapolated forward suggests exponential growth. It should be noted that both 2019 and 2020 were affected by pandemic local lock downs, the data for these years are not considered to be representative. The green dashed trend line shown in Figure 4 shows that by removing the years 2019 and 2020 as exceptions due to the pandemic the declining trend is more gradual. This suggests a growth rate of minus 3.93% per annum over a 4-year period (2017-2021).

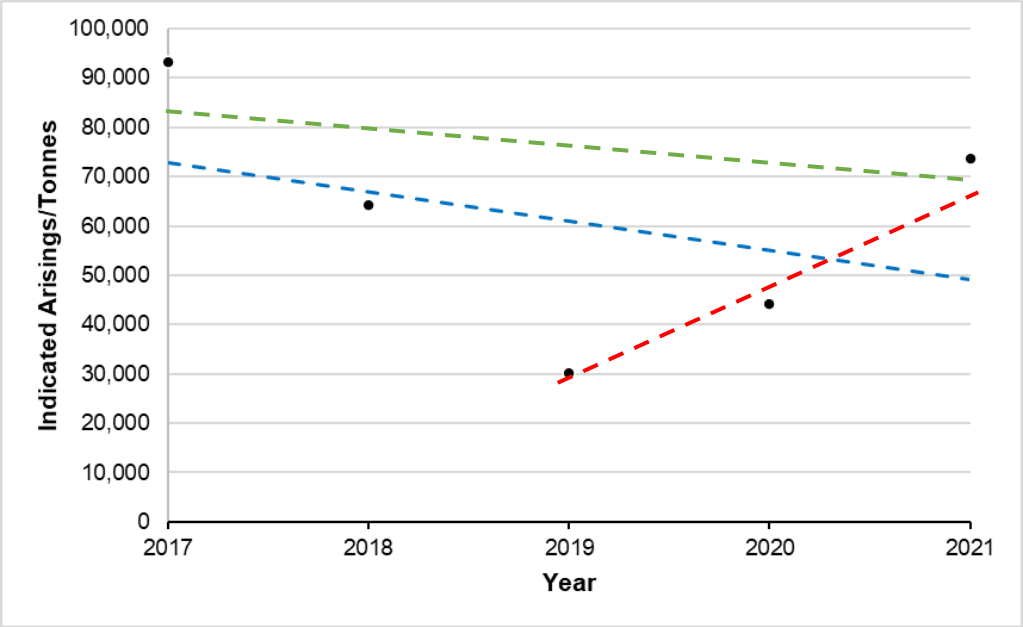

Figure 4: Hazardous Waste arising (tonnes) in Gloucestershire as recorded by the WDI (2017-2021) (with additional trend line)

Given the variability in hazardous waste arisings in Gloucestershire, it is not considered appropriate to solely rely on the historical projection using total tonnes of waste for forecasting of future hazardous waste arisings. Therefore, the composition of arisings has been considered on a waste type basis.

3.3 Composition of Gloucestershire Hazardous Waste

Table 4 below presents the principal arisings of Gloucestershire hazardous waste for 2021 based on the WDI dataset. Hazardous waste types arising in a quantity greater than 500 tonnes account for nearly 88% of arisings, and these have been aggregated into the nine categories in Table 4.

Table 4: Principal Hazardous Waste Types arising in Gloucestershire in 2021 (>500 tonnes)
Source: WDI 2021

Hazardous Waste Type/Source	Total
Construction, Demolition & Excavation Waste	17,822
Materials from Waste and Water Treatment	14,862
Vehicle Maintenance inc ELV components	17,177
Bituminous waste	5,646
WEEE	2,324
Oil water from oil/water separators	1,555
Treatment of Metals and Plastics	1,558
Thermal Processing	1,849
Inorganic Chemical Processing	945
Infectious Clinical Waste	866
Total	**64,605**

- C, D & E waste ranked first amongst the nine hazardous waste types. The predominant wastes are contaminated soil (17 05 03) at c14,500 tonnes and asbestos contaminated waste (17 06 05) at c4,000 tonnes.
- Materials from waste and water treatment consists of stabilised waste (19 03 04) at c8,000 tonnes, solid wastes from gas treatment (19 01 07) at c5,000 tonnes and landfill leachate (19 07 02) at c2,500 tonnes.
- Vehicle maintenance including ELVs and components consists of ELVs (16 01 04) at c15,000 tonnes, lead acid batteries (16 06 01) at c1,000 tonnes and engine gear and lubricating oils (13 02 05 + 13 02 08) at c1,500 tonnes.
- Bituminous waste (17 03 01) at c5,500 tonnes.
- WEEE (20 01 35) at c2,000 and WEEE containing chlorofluorocarbons (20 01 23) at c1,000.
- Oil based waste from drainage systems consisting of oily water from oil/water separators' (13 05 07) at c1,000 tonnes and wastes from grit chambers and oil/water separators (13 05 08) at c1,000 tonnes.
- Thermal processing waste consisting of solid wastes from on-site effluent treatment (10 11 19) at c2,000 tonnes.
- Inorganic chemical processing consisting of sodium and potassium hydroxide (06 02 04) c1,000 tonnes.
- Infectious clinical waste (18 01 03) at c1,000 tonnes.

3.4 Forecasting Arisings of Gloucestershire Hazardous Waste by Type

To discern possible trends the data for hazardous waste arisings >500 tonnes over the past 5 years reported through the WDI has been reviewed and are presented in Figure 5.

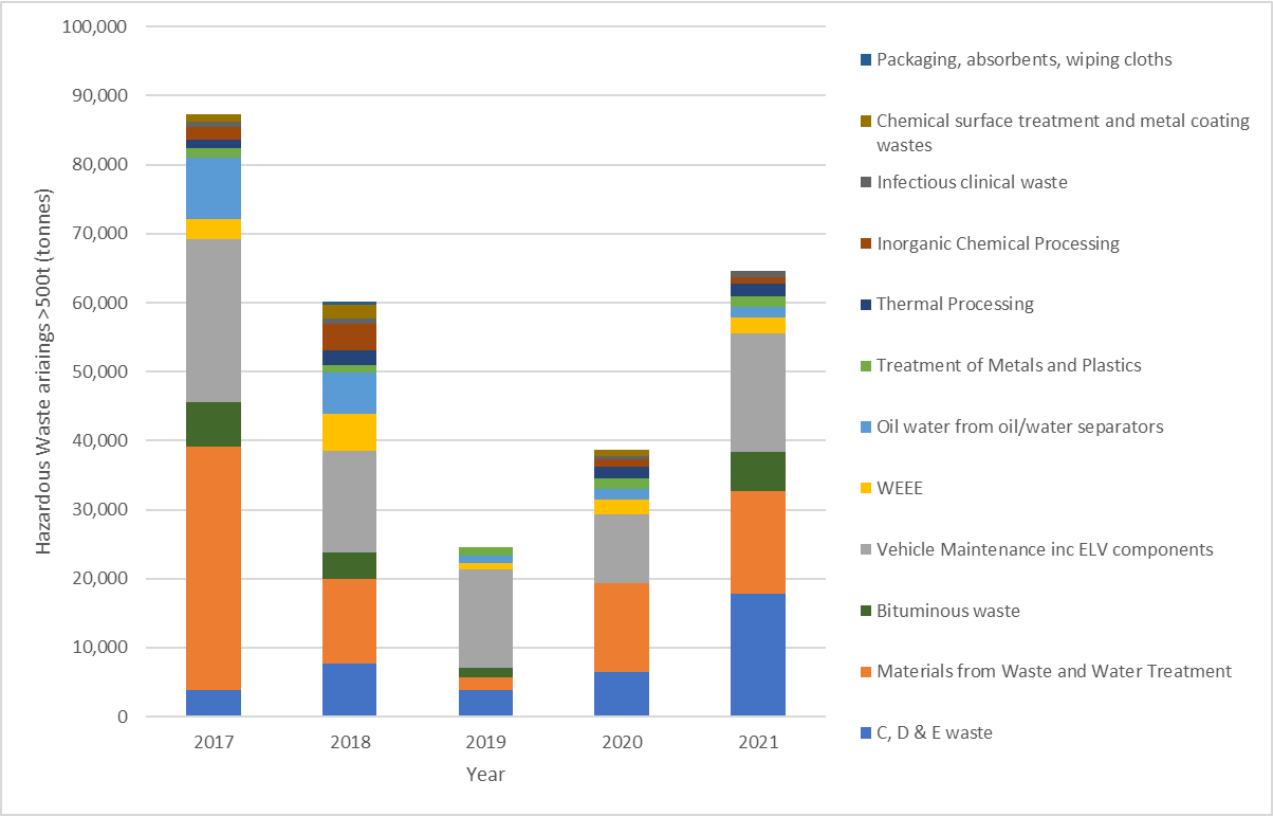

Figure 5: Principal Hazardous Waste Component Arisings in Gloucestershire 2017-2021
Source: WDI

Figure 5 shows the largest three principal waste streams (C, D & E waste, materials from waste and water treatment and vehicle maintenance) fluctuated significantly over the 5-year period. This creates such an amount of 'noise' that makes it difficult to discern any apparent trends other than an overall fall in the first 3 years to 2019 followed by two years of growth (or recovery). The other ten smaller waste stream types also vary across this period.

4. Future waste arisings

As discussed in Section 3, while the 2013 National Policy Statement for Hazardous Waste[8] considers that arisings of particular hazardous waste can be expected to increase, it is considered that production of the principal hazardous wastes produced in Gloucestershire will stabilise if not decline over time for the following reasons:

1. Regulations banning the use hazardous materials and components in consumer products mean that over time the quantity of hazardous material in WEEE should decline.
2. Hazardous materials such as asbestos and chromate treated wood bound up in the building stock will reduce as the elements are replaced.
3. The incidence of land contamination by industrial use will reduce due to more stringent regulatory controls meaning that contaminated soil will only arise as a result of legacy sites which will decline over time.
4. Electric vehicles are expected to account for 20% of car sales at 2025, with a ban on sales of conventional vehicles by 2035 now proposed by Government[9].

Given the high variability between arisings each year and the National Policy Statement for Hazardous Waste advice that hazardous waste is expected to increase in the short-term but based on the assumptions above hazardous waste can be expected to stabilise over time, the following growth forecast is suggested on a waste stream basis:

- Hazardous C, D & E waste held constant to 2031 before applying a decline of minus 3.9% (as per historical 4-year declining trend) per annum with the expectation that over time arisings of this component will reduce as historical land contamination (source of contaminated soils) is remediated and the stock of asbestos in buildings is removed;
- Materials from waste and water treatment held constant over the Plan period given one of the main contributors is air pollution control residues from the Javelin Park EfW plant;
- oily vehicle maintenance waste inc ELV components can be expected to fall with the transition to electric vehicles. While some of the current conventional vehicle stock will remain in use beyond 2035 the gradual shift can be expected to depress any growth in arisings in this sector. Therefore, a minus 3.9% growth has been applied.

The growth forecasts based on these assumptions are presented in Table 5.

[8] 3.2.2 The total amounts of hazardous waste remain significant and are expected to increase – National Policy Statement for Hazardous Waste, 2013

[9] Note that the transition from combustible engines to electric vehicles is expected to be a gradual shift. However, it may be beneficial to include a policy which provides a degree of flexibility of ELV depollution sites.

Table 5: Forecast Hazardous Waste Arisings in Gloucestershire
Source: Baseline Arising plus discussion above

Hazardous Waste Type/Source	Plan Milestone Year				
	2021	2026	2031	2036	2041
Construction, Demolition & Excavation	12,176	12,176	9,784	7,862	6,318
Materials from waste and water treatment	14,862	14,862	14,862	14,862	14,862
Vehicle Maintenance inc ELV components	17,177	13,803	11,092	8,913	7,163
Subtotal	44,215	40,841	35,738	31,638	28,342
Other wastes[10]	29,462	29,462	29,462	29,462	29,462
Total Projected Arisings	**73,677**	**70,303**	**65,200**	**61,100**	**57,805**

Conclusion

The forecast assumptions result in a reduction in hazardous waste arising in Gloucestershire from the 2021 baseline arising of **c73,500 tonnes** to **c58,000 tonnes** in 2041. This reflects the best available data combined with an understanding of factors likely to affect arisings as set out above. These values have therefore been used to project capacity requirements based on an assessment of existing capacity within Gloucestershire and management routes followed, in Section 5.

[10] Including hazardous waste <500t.

5. Hazardous Waste Management Capacity in Gloucestershire

This section considers the availability of capacity within Gloucestershire for managing hazardous waste based on the latest data available i.e. 2021. It provides the basis on which the quantum of existing hazardous waste management capacity may be established and, subsequently, from which specific management capacity requirements might be identified. Quantities of hazardous waste inputs to sites recorded in the WDI across 5 years and the Environment Agency permitted site listing have been reviewed to establish each site's most representative capacity i.e., the notional capacity, shown in Table 6. The sites identified as non-hazardous waste transfer stations (WTS) have been ignored as hazardous inputs will only be accepted on an incidental basis, as well as any HWRC's on the basis that they will be principally accepting other waste streams, particularly LACW. Four other sites were also removed on the basis that their primary input of waste was non-hazardous (hazardous <25%).

Table 6: Notional Capacity of Facilities Permitted to Manage Hazardous Waste in Gloucestershire (>100 tonnes)
Source: WDI

Facility Type	Facility Name + Operator	WDI 5 yr peak	Permit limit	Preferred value	Notes
Vehicle Depollution on Facility	Abbey Recycling, Abbey Metal Recycling Ltd	5,978	75,000	5,978	
	Cotsworld View, Gloucester Road, Henry Raymond Buckland, Henry James Buckland, Harry James Buckland	5,538	-	5,538	
	Dursley Auto Dismantlers, Smith's (Gloucester) Ltd	1,437	25,000	1,347	
	Forest Auto Salvage, Mark Anderson	984	25,000	984	
	8 Broadway Lane, Never Despair Breakers	665	25,000	665	
	Empire House, Synetiq Ltd	2,642	-	2,642	
	Gilders Yard, Joe Gilder Recycling Ltd		5,000	5,000	Permit for metal recycling, vehicle storage and depollution and dismantling. Permit limit: <25,000 tpa metals <5,000 tpa ELVs Cannot find planning permission
	Broadmoor Road, FAB Recycling Ltd	914	-	914	Only inputs in 2017 and 2018. Still appears operational from website but not on permit register.
	Phelps Brothers, J G & R Phelps	15,958	25,000	15,958	Only managed principally hazardous waste in 1/5 years from WDI check for peak input
MRS	Canal Works, Bendall Metal Recycling Ltd	15,797	-	15,797	
	Forest Metals, Kyle Gettings	12,399	25,000	12,399	
			Total	**67,312**	

Comparing the notional overall capacity value (c67,500 tonnes) to the peak arising value for Gloucestershire (c73,500 tonnes in 2021) suggests a deficit of hazardous waste management capacity of c6,500 tpa within Gloucestershire. However, that fails to account for the fact that Gloucestershire hosts a dedicated hazardous waste landfill.

5.1 Wingmoor Farm Hazardous Waste Landfill

Gloucestershire hosts a dedicated hazardous waste landfill at Wingmoor Farm, Bishops Cleeve. The site accepted a total of c17,500 tonnes of hazardous waste in 2021 of which c11,000 tonnes was from Gloucestershire. The Agency's dataset on remaining landfill void shows that Wingmoor Farm has 991,399m^3 of voidspace remaining at the end of 2021. Total inputs over 5 years is shown in Table 7 below.

Table 7: Inputs to Wingmoor landfill (2017-2021) tonnes

Year	2017	2018	2019	2020	2021
Tonnes	39,813	19,108	12,881	13,719	17,468

A review of the types and sources of inputs to Wingmoor Farm hazardous waste landfill over 5-years is shown in Table 8.

Table 8: Principal WPAs Depositing Hazardous Waste at Wingmoor Farm Landfill (2017-2021)

Region >500 tonnes	Origin WPA >100 tonnes	Principal waste type (2021)	2017	2018	2019	2020	2021
South East	Kent	Sludges from physico/chemical treatment	<100	687	524	486	340
	Medway		<100	<100	<100	<100	278
	Slough	APCr	630	857	855	675	640
	South East	Hazardous sludges and filter cakes	431	433	437	429	434
	Southampton City	Sludges from physico/chemical treatment	504	487	450	426	485
South West	Bristol City	Sludges from physico/chemical treatment and asbestos C, D & E	943	539	772	362	998
	Gloucestershire	Wastes from effluent treatment, stabilised wastes and asbestos C, D & E	32,190	13,019	6,788	8,424	10,367
	South Gloucs	Asbestos C, D & E	1,013	107	<100	<100	<100
	South West	Soils and stones and asbestos C, D & E	1,569	820	841	898	1,492
Wales	Wales	Hazardous waste blasting material	790	746	<500	<500	636
West Midlands	Birmingham City	Hazardous C, D & E	363	<100	<100	<100	300
	Herefordshire	Various wastes sub 100 tonnes	258	278	238	162	147
	West Midlands	Asbestos C, D & E	325	253	405	384	498
	Worcestershire		463	534	487	362	370

Table 8 shows Wingmoor Farm Landfill has contributed to the management of a range of hazardous waste not only from the South West, but also from neighbouring regions (South East, West Midlands and Wales) over the period 2017-2021. The principal waste types received include asbestos C, D & E waste, solid wastes from effluent treatment and sludges from physical/ chemical treatment, demonstrating it is a nationally significant facility. It is also understood that the site hosts some basic treatment capacity as well to ensure that waste deposited has been subject to pre-treatment as per the Landfill Directive requirement.

5.2 Management Capacity Conclusion

Gloucestershire hosts a number of facilities that manage hazardous waste including vehicle depollution sites and a dedicated hazardous waste landfill. The combined notional capacity offered by facilities within Gloucestershire capable of managing hazardous waste has been taken to be around c67,500 tonnes per annum if landfill capacity is excluded.

Wingmoor Farm boosts Gloucestershire's capacity to manage hazardous waste significantly, Offering just under 1 million (991,399m^3) cubic metres of void space. Given the site accepted an average of c20,500 tonnes per annum over a 5-year period, and assuming 1 tonne of hazardous waste would occupy 1m^3 of void, the landfill has a predicted lifespan of over 45 years (subject to any planning restriction).

Regardless of the above it is important to ensure that each type of hazardous waste produced within Gloucestershire in significant quantities will be adequately catered for throughout the Plan period. For this reason, the role of facilities beyond Gloucestershire in the management of certain types of hazardous waste arising in Gloucestershire is considered in the following section.

6. Management Routes Followed by Gloucestershire Hazardous Waste

This section assesses the management routes followed by hazardous waste that arises in Gloucestershire but is managed elsewhere. This exercise is important to identify WPAs hosting receiving facilities with whom GCC should engage under the Duty to Co-operate to establish if the current patterns of management can continue for the Plan period. If such engagement suggests that certain types of waste cannot continue to be managed at certain facilities in future, then this may require Gloucestershire to plan for the management of that waste type within its own boundaries.

Of the c73,500 tonnes of hazardous waste produced in Gloucestershire in 2021, c46,000 tonnes left Gloucestershire for management. Table 9 shows the recipient WPAs ranked in terms of quantity of waste received and fate. A significance threshold, whereby WPAs receiving 100 tonnes of hazardous waste or more have been considered. Additional WPAs in Table 2 that reported less than 100 tonnes in the WDI but were reported as receiving more than 100 tonnes in the HWI have been included but site-specific details are not included in Table 10 as the HWI does not attribute tonnages to specific sites.

Table 9: WPAs Receiving over 100 tonnes of Hazardous Waste from Gloucestershire (in rank order) with inputs by single fate exceeding 100t highlighted

Source: WDI 2021

	Waste Fate					
Receiving WPA	**Incineration**	**Landfill**	**MRS**	**Transfer**	**Treatment**	**Total**
Wolverhampton	0	0	0	<100	13,345	13,377
North Somerset	0	0	0	<100	5,651	5,653
Northamptonshire	0	192	0	<100	5,020	5,218
Worcestershire	<100	1,360	638	1,238	254	3,564
Sandwell	0	0	2,536	174	1,101	3,810
Bristol City	128	0	1,045	154	1,761	3,089
Wiltshire	0	1,883	0	<100	<100	1,909
Warwickshire	0	317	<100	<100	845	1,186
Walsall	0	0	0	260	259	519
Swindon	0	0	342	0	516	858
Salford	0	0	0	0	802	802
South Gloucestershire	0	0	0	585	0	585
Cambridgeshire	0	<100	<100	264	150	481
Derbyshire	0	0	0	<100	405	408
Staffordshire	0	0	0	<100	392	402
North East Lincolnshire	0	0	0	0	297	297
Nottinghamshire	0	0	<100	0	262	266
Telford and Wrekin	0	0	0	0	233	233
Oxfordshire	0	0	0	202	<100	237
Nottingham City	0	0	228	<100	0	230
Dorset	0	0	0	<100	208	219
Tameside	0	0	0	0	183	183
Plymouth	0	0	0	0	163	163
Total	**203**	**3,780**	**4,849**	**2,957**	**31,901**	**43,689**

This shows that Wolverhampton is the principal recipient (c13,500 tonnes), followed by North Somerset (c5,500 tonnes) and Northamptonshire (c5,000 tonnes). These WPAs together account for 55% of exports.

Table 10 identifies site specific information and principal wastes received related to the host WPA for the purposes of Duty to Cooperate (DtC) that requires site specific information when contacting host WPAs.

Table 10: WPAs receiving over 100 tonnes of Hazardous Waste from Gloucestershire in 2021 and the permitted site it is managed at
Source: WDI 2021

Planning Region	WPA	Principal Waste Description	Input (tonnes)	Site Name
North West	Salford	sodium and potassium hydroxide	720	CSG Lanstar (Cadishead)
		aqueous rinsing liquids containing dangerous substances		
	Tameside	fuel oil and diesel	183	Manchester Fuel Services
West Midlands	Sandwell	combination of other waste types (sub 100 tonnes)	173	Bullock Street
		soil and stones containing dangerous substances	490	ERQ - STC
		end-of-life vehicles	2,260	Mighty Trading Ltd
		WEEE	262	Rabone Lane
		sodium and potassium hydroxide	516	Wednesbury WM Resource Centre
	Staffordshire	acids not otherwise specified	283	Stoke Waste Treatment & Transfer Facility
	Telford and Wrekin	WEEE	232	AO Recycling Telford
	Walsall	combination of other waste types (sub 100 tonnes)	251	Brownhills Environmental Management Facility
		Lead acid batteries	195	Triple R Solutions Ltd
		machining emulsions and solutions free of halogens	939	Walsall Oil Treatment Plant
		synthetic engine, gear and lubricating oils		
		other emulsions		
	Warwickshire	machining emulsions and solutions free of halogens	845	CSG Coventry Treatment Plant
		track ballast containing dangerous substances	317	Cross Hands Quarry Landfill Site
	Wolverhampton	soil and stones containing dangerous substances	13,345	Horseley Field Waste Treatment Facility
	Worcestershire	mixtures of wastes from grit chambers and oil/water separators	1,225	CSG Worcester
		oily water from oil/water separators		
		synthetic machining oils		

		mineral-based non-chlorinated engine, gear and lubricating oils		
		construction materials containing asbestos	1,360	Hartlebury Landfill Site
		end-of-life vehicles	606	R & C Metals
		mineral-based non-chlorinated engine, gear and lubricating oils	315	Stourport Oil Treatment Plant
		combination of other waste types (sub 100 tonnes)	211	Unit 145 Elm Drive
East Midlands	Derbyshire	sodium and potassium hydroxide	402	Ilkeston Waste Treatment and Transfer Facility
		acids not otherwise specified		
	Northamptonshire	black drosses from secondary production (EWC 10)	192	East Northants Resource Management Facility
		solid wastes from gas treatment	4,961	East Northants RM Facility
	Nottingham City	WEEE	228	Harrimans Lane
	Nottinghamshire	mineral-based non-chlorinated engine, gear and lubricating oils	262	Bilsthorpe Oil Treatment Plant
East of England	Cambridgeshire	infectious clinical waste	264	Vetspeed, Thriplow
		soil and stones containing dangerous substances	150	Mepal Soil and Waste Treatment Centre
South West	Bristol City	oily water from oil/water separators	523	Augean Waste Treatment Plant
		readily biodegradable machining oil		
		combination of other waste types (sub 100 tonnes)	105	Avonmouth Treatment Centre
		infectious clinical waste	249	Clinipower Avonmouth LLP
		interceptor sludges	967	CSG Bristol Treatment Plant
		mixtures of wastes from grit chambers and oil/water separators		
		oily water from oil/water separators		
		machining emulsions and solutions free of halogens		
		WEEE	1,045	Sims Group U K Ltd
	Dorset	wastes containing oil	208	Shaftesbury Oil and Water
	North Somerset	bituminous mixtures containing coal tar	5,646	Plot 2, Warne Road
	Plymouth	aqueous liquid wastes and aqueous concentrates from groundwater remediation	163	SYLOC Waste Treatment Facility
	South Gloucestershire	combination of other waste types (sub 100 tonnes)	548	Safetykleen U K
	Swindon	infectious clinical waste	496	Swindon Clinical Waste Transfer and Treatment Facility

		end-of-life vehicles	336	Swindon Metal Recycling Limited
	Wiltshire	construction materials containing asbestos	1,883	Parkgate Farm Hazardous Waste Landfill
		soil and stones containing dangerous substances		
South East	Surrey	soil and stones containing dangerous substances	648	Site located in Reigate and Banstead. Site details unknown from HWI.
	Oxfordshire	combination of other waste types (sub 100 tonnes)	199	Ewelme Hazardous Waste Transfer Station
Yorks & Humber	North East Lincolnshire	lead acid batteries	223	Immingham Materials Recycling Facility

6.1 Conclusion on Gloucestershire's Hazardous Waste Management Capacity Requirements

The updated hazardous waste baseline value for 2021 is c73,500 tonnes. The capacity assessment indicates that the combined notional capacity of the principal sites receiving hazardous waste in Gloucestershire is around c67,500 tpa, if the capacity at Wingmoor Farm landfill is excluded. Although the capacity at Wingmoor Farm which offers 991,399m^3 of void space is finite, the current fill rates suggest the landfill will provide capacity for the next Plan period (and beyond). However, it is still recommended that the other principal sites be safeguarded through policy whereby potential loss of capacity in future, through either redevelopment or constraints, is discouraged unless equivalent compensatory capacity is demonstrated.

Given the high degree of reliance on facilities outside Gloucestershire the continued availability of capacity for the Plan period at facilities outside Gloucestershire identified as managing significant quantities should be confirmed under the Duty to Cooperate through contact with the host Waste Planning Authorities listed in Table 10.