

2nd February 2022



Comhairle Ceantair
Lár Uladh
Mid Ulster
District Council

To: Councillor Gildernew)
Councillor Graham)
Councillor McAleer)
Councillor McGuigan) Mid Ulster District Council
Councillor Robinson)

Mrs AM Campbell

Councillor Clarke)
Councillor Fitzgerald)
Councillor Garrity)
Councillor Rainey) Fermanagh & Omagh District Council
Councillor Thompson)

Ms A McCullagh

Dear Sir/Madam

Re: Tullyvar Landfill Site Joint Committee Meeting

A meeting of the Management Committee for the development of Tullyvar Landfill Disposal Site will be held in Dungannon Council Chamber on **Wednesday 9th February 2022 at 10.30am. A Zoom link will also be sent to Members to facilitate remote access.**

1. Confirmation of Minutes of the AGM Meeting and Ordinary Meeting held on Wednesday 29th September 2021 (copies herewith)
2. Matters Arising from the Minutes
3. Financial Matters
 - 3.1 9 Months Accounts & 2022/23 Budget Report
4. Update from Assistant Director of Environmental Services /Site Manager's Report (copy herewith)
5. Any Other Business

6. Date of Next Meeting
- Wednesday 14th September 2022 at 10.30am

Yours faithfully

Anne-Marie Campbell

Director of Environment

Copy: A McCreesh
 J News
 M McAdoo
 A McIlwrath/P Bradley
 K McGowan

**MINUTES OF TULLYVAR AGM HELD ON WEDNESDAY 29TH SEPTEMBER 2021
AT 10.30AM VIA ZOOM/TULLYVAR LANDFILL SITE**

PRESENT:

MID ULSTER: Councillor McAleer (Tullyvar) - Chair
Councillors Gildernew (Zoom), Graham (Zoom),
McGuigan (Zoom), Robinson (Tullyvar)

FERMANAGH & OMAGH: Councillors Garrity (Zoom), Rainey (Tullyvar) &
Thompson (Tullyvar)

OFFICERS: M Kelso (Tullyvar)
A-M Campbell (Zoom)
M McAdoo (Tullyvar)
K McGowan (Tullyvar)
A McIlwrath (Tullyvar)

APOLOGIES: Councillors Clarke & Fitzgerald

Meeting commenced at 10.30am

1. OUTGOING CHAIR'S REMARKS

The Chair thanked Joint Committee Members for affording him the opportunity to serve and thanked Members and Officers for their support throughout his term in office. The Chair referred to the significant changes at the site over the years since its inception and wished to put on record his thanks to the Site Manager and Officers for their continued efforts and diligence in the site management.

2. ELECTION OF CHAIR

Proposed by Councillor Robinson
Seconded by Councillor Thompson and agreed

That Councillor McAleer be elected Chair.

Councillor McAleer thanked Members for her Election and called for nominations for the Vice Chair.

3. ELECTION OF VICE CHAIR

Proposed by Councillor Thompson
Seconded by Councillor Garrity and agreed

That Councillor Rainey be elected Vice Chair.
Councillor Rainey thanked Members for his Election.

4. **ANNUAL FINANCIAL REVIEW**

The Site Manager outlined the annual financial report, copy previously circulated, highlighting the income and expenditure for 20/21.

The Chair thanked the Site Manager for the detailed overview and commended Officers on the efficient operation of the site.

Following query from the Chair, the Site Manager confirmed approximately 9000 trees were planted in April and there could well be some loss given the extreme dry period which followed the planting programme, however, the trees were in the early stages of establishment.

5. **ADOPTION OF REPORT**

The Site Manager's Financial Overview report was adopted.

Proposed by Councillor Thompson
Seconded by Councillor Robinson and agreed

Meeting ended at 10.45am

**MINUTES OF TULLYVAR JOINT COMMITTEE MEETING HELD ON WEDNESDAY
29TH SEPTEMBER 2021 AT 10.45AM VIA ZOOM/TULLYVAR LANDFILL SITE**

PRESENT:

MID ULSTER: Councillor McAleer (Tullyvar) - Chair
Councillors Gildernew (Zoom), Graham (Zoom),
McGuigan (Zoom), Robinson (Tullyvar)

FERMANAGH & OMAGH: Councillors Garrity (Zoom), Rainey (Tullyvar) &
Thompson (Tullyvar)

OFFICERS: M Kelso (Tullyvar)
A-M Campbell (Zoom)
M McAdoo (Tullyvar)
K McGowan (Tullyvar)
A McIlwrath (Tullyvar)

APOLOGIES: Councillors Clarke & Fitzgerald

Meeting commenced at 10.45

1. CONFIRMATION OF MINUTES – 10TH FEBRUARY 2021

The minutes of the above meeting were adopted.

Proposed by Councillor Thompson
Seconded by Councillor Gildernew and agreed.

2. MATTERS ARISING

As per agenda items.

3. UPDATE REPORT FROM SITE MANAGER

The report of the Site Manager, as previously circulated, was considered, reference being made to the undernoted:

3.1 Gas Generation

It was noted that since the commencement of the gas generation project in May 2010, approximately £1,386M had been generated in income.

3.2 Site Visit by Lisburn & Castlereagh Council

Following query from the Chair, the Site Manager outlined the background and purpose for the visit by a delegation from Lisburn & Castlereagh. The visit was informative and an opportunity to highlight the ongoing environmental and sustainable projects on site.

The Site Manager offered a tour to any Elected Member interested in a walkover of the site, post the conclusion the Joint Committee meeting, or at another suitably convenient time.

3.3 Adoption of Site Manager's Report

The Site Manager's report was adopted.

Proposed by Councillor Thompson
Seconded by Councillor McGuigan and agreed.

4. ANY OTHER BUSINESS

4.1 Collection of Farm Plastics

Councillor Robinson sought an update on the collection of farm plastics. The Site Manager confirmed that a report was presented to the Environment Committee in MUDC in April and whilst there was no immediate plans to change the current arrangements for collection and treatment of farm plastics, it was agreed to include and address the options for farm plastics within a wider plastics recycling campaign being launched by MU.

4.2 Cell 4 Development

Councillor Gildernew highlighted the value of the asset in terms of future void capacity should the need arise for Cell 4 development. The Site Manager confirmed that Cell 4 had 650,000 cubic metres of void which provided valuable future options

4.3 Landfill Related Services Tender

Following query from Councillor Rainey on Lot 5 of the procurement exercise, the Site Manager provided clarification on the pH dosing required in the system. The Site Manager confirmed that the optimum dosing programme had been achieved over the years in order to keep the monitoring parameters at the correct levels.

4.4 Water Sampling

Following query from Councillor Robinson, the Site Manager advised that sampling across the site varied from a monthly, quarterly and annual basis depending on the boreholes and parameters being tested. The Site Manager confirmed that with the mothballing of the site, the monitoring regime had been reduced and hence the annual sampling costs had also reduced.

5. DATE OF NEXT MEETING

It was agreed to convene the next meeting on Wednesday 9th February 2022 at 10.30am, venue to be confirmed. A Mcllwraith to circulate to Members the proposed meeting dates for 2022.

Meeting ended at 11.10am

TULLYVAR JOINT COMMITTEE

PROPOSED MEETING DATES – 2022

DATE/TIME	LOCATION
Wednesday 9 th February 2022 at 10.30am	Tullyvar Landfill Site
Wednesday 14 th September 2022 at 10.30am	Tullyvar Landfill Site

TULLYVAR JOINT COMMITTEE – 9th FEBRUARY 2022

SITE MANAGER'S REPORT

1. Site Operational Update

Between September 2021 and January 2022 approx. 145 tonnes of leachate per week was discharged to Cookstown Sewage Treatment Works. The Annual NIWater compliance report for 2021 was received in January and Tullyvar was deemed compliant, the main results of which are detailed in the table below:

Parameter	Annual Average	Limit	Compliance Score
Ammoniacal Nitrogen	114 mg/l	400 mg/l	100%
Chemical Oxygen Demand	1017 mg/l O ₂	2000 mg/l O ₂	100%
Suspended Solids	93 mg/l	500 mg/l	100%
pH	Min 6.03 / Max 7.69	Min 5 / Max 10	100%

Mothballing works have continued until early December and included further regrading works that will prepare Cell 4 for either lining or restoration. Some minor grading works are still required but this work has been postponed until summer 2022 to allow the steep banks to dry out. Pictures showing the works are shown below:



A further year of electricity generation was completed at the end of May 2021 in which the site generated 3.39 GWHrs of electricity. A sum of £99,311.88 has now been invoiced to Renewable Power Systems, bringing the total income to date from landfill gas to approx. £1,385M.

2. Financial Matters

A budget has been prepared by Officers for the 2022/23 period, the projected operational expenditure for the coming financial year is £184,748, a decrease of approx. 8% to reflect the further winding down of site operations. The major costs in the next financial year are £57,658 for leachate haulage, salaries and wages of £31,500, environmental monitoring costs of £19,200, fees of £12,500, and electricity at £12,000. Some costs have increased due to the increase in contractual rates for leachate haulage, environmental monitoring and plant hire but have been partially offset from reduced leachate haulage and planned site works.

Site income for the year is estimated at £89,698 from the predicted electricity generation royalties. This gives a net expenditure for the year of £95,050 which will be funded from the sites reserves. In addition to this operational expenditure, a further £12,000 of capital expenditure is proposed to improve site security. This expenditure covers £10,000 for a secure shed to store site vehicles and £2,000 to upgrade the on-site CCTV system for remote monitoring.

The full budget and details of the last 9 months expenditure are detailed in Appendix 2. At the end of the first 9 months of the current financial year the site had £737,692.73 in its bank current account / reserves so additional funding from the two Councils will not be necessary for the foreseeable future.

3. NI Landfill Capacity Report

At the Joint Committee meeting on the 29th September 2021 it was agreed to commission a review by the Mid Ulster District Councils appointed waste consultants, WDR & RT Taggart, to review future landfill capacity in Northern Ireland. The main purpose of the report was to determine if, or when, Tullyvar would need to develop Cell 4 should a shortage of landfill capacity develop.

The report covered the following:

- Current landfill capacity;
- The latest reported volume of waste landfilled;
- Northern Ireland future landfill capacity looking at a number of scenarios such as the early closure of Local Authority owned sites, the potential implementation of the arc21 EfW facility (Beacon), potential waste growth and statutory recycling targets;
- Identification of potential sites for development; and
- Ranking of potential development sites based on a series of criteria.

According to the report, at the start of 2021, there was approximately 7.2m tonnes of landfill capacity in Northern Ireland. The majority of this landfill capacity is held in two sites by two private sector operators, Cottonmount Landfill and Aughrim Landfill. This capacity has the potential to rise to 7.9m tonnes of waste if Phase 4 of Tullyvar was to be developed in the future.

The report notes that there will only be a small number of landfill site operator's by around 2025, all of which will be private sector. Therefore, there is the potential that landfill gate fees may increase. An assessment was then carried out on potential sites that could be developed to provide additional capacity and prevent a lack of competition in the landfill market. Of the list below only 1 Local Authority site was considered due to the potential void and the consents that are currently in place.

- Phase 4 at Tullyvar;
- Cam Road, Macosquin;
- Ladyhill Quarry, Antrim.

In order to protect Local Authorities from the potential rise in landfill gate fees it is considered that the most viable option for future landfill capacity would be the remaining capacity at Tullyvar Landfill Site. This would be the preferred site due to the infrastructure that is currently in place such as the welfare facilities, leachate treatment plant, wetlands, and landfill gas infrastructure. Therefore, the development costs of landfill capacity at Tullyvar verses Cam Road and Ladyhill would be substantially lower.

However, from the modelling conducted, currently there is no reason to reopen Tullyvar Landfill at this point in time due to the following;

- Circular Economy targets increasing the recycling rate to 55% by 2025, 60% by 2030, 65% by 2035, and no more than 10% of municipal waste to landfill by 2035. This will result in a continued decreasing volume of residual waste to be landfilled.
- Many Council Corporate Plans now make commitments to reducing dependency on landfill by increasing recycling, reusing and recovering energy from Council collected waste further reducing the need for landfill capacity.
- Technology has significantly advanced over the past 10 years with the rise of automation, artificial intelligence and near infra optical sorting. These advances in technology have improved recovery rates of materials recovery facilities. Such improvements in technology have resulted in less residual waste from dirty MRF processes that need to go to Landfill (35% to 14.6%).
- Due to the decline in Local Authority landfill sites those Councils that historically relied on landfill will now have to consider residual waste treatment contracts.
- Extension of Craigmore Landfill offering an additional 616,000 tonnes of landfill capacity in January 2021.
- Modelled projections show no deficit in landfill capacity by 2030.

It is recommended that this landfill capacity review is undertaken in another 2 years in order to assess the future landfill capacity and any impacts that new technologies / processes may have on the volume of waste landfilled.

4. Sale of Obsolete Plant and Equipment

Now that operations on site have ceased it is necessary to dispose of old obsolete equipment to auction. It is proposed to auction of the following items:

- Deutz 6.38 Agrostar – Surplus to requirements, New Holland 6020 to be retained for activities on-site in the interim. Age and condition of this tractor would necessitate replacement in the event of the site reopening so there is no benefit in its retention.
- Bridgemont Surface Mounted Weighbridge – Replacement / repair of damaged ramps, load cells and indicator estimated at approx. £10,000. Weighbridge is no longer required so the best economical option would be to auction it off and replace with a new weighbridge in the event of re-opening.
- 2 No. trailers – Surplus to requirements following refurbishment of Recycling Centre and their replacement with compactor skips.
- Slurry Tanker – Originally purchased for leachate transport but more recently used for road cleaning and dust suppression. No longer required for these purposes and the tractor mounted sweeper is to be retained for road sweeping.

Appendix 1 – Interim Financial Review

1. Income & Expenditure

Draft accounts for the first 9 months of the 2021/22 financial year have been prepared with the main points summarised below. Please note that some figures may be subject to minor changes before being submitted to auditors.

- There has been no income for the year to date, however, £6,438.68 was recovered from longstanding debtors. A further £ 99,311.88 is expected before the end of the year as a gas royalty payment from Renewable Power Systems.
- Operational expenses for the first 9 months totalled £132,558.73 compared to a budget of £150,017.00. The main apparent underspends were for leachate related expenses and rates, however, some costs in these categories are due before the end of the year so any underspend at year end will not be as significant. The top 5 expenditure items are listed below:

▪ Leachate Tankering & Treatment	£31,192.94
▪ Salaries & Wages	£23,439.15
▪ Hire of Equipment	£21,700.38
▪ Environmental Monitoring	£10,603.11
▪ Insurance	£10,440.00

2. Balance Sheet

The balance sheet figures as of the 31st December 2021 are presented below:

Current Assets	-	£843,746.06
Current Liabilities	-	£121,419.69
Net Current Assets / Liabilities	-	£722,326.37

Other Items:

Cash on Account	-	£737,692.73
Closure & Aftercare Provision	-	£191,433.72

Appendix 2 – 9 Month Accounts and Proposed 2022/23 Budget

Account Code	Expense Description	2021/22 9 Mts TD*	2021/22 Budget	2022/23 Budget
2176	SALES	0	0	0
2991	DEPOSIT A/C INTEREST	0	0	0
2501	GAS GENERATION INCOME	0	(133,257)	(89,698)
4990	MISC INCOME	0	0	0
	1 Total	0	(133,257)	(89,698)
2004	SALARIES & WAGES	23,439	39,240	31,500
2006	LEACHATE TREATMENT	31,193	60,210	57,658
2009 & 2117	MANAGEMENT CHARGE	8,250	11,000	11,000
2010	RATES	0	8,500	8,500
2011	INSURANCE	10,440	10,500	10,500
2012	HEAT & LIGHT	8,081	10,000	12,000
2018	REPAIRS & RENEWALS GENERAL	502	6,000	5,000
2021	REPAIRS VEHICLES	3,315	1,500	1,500
2024	BANK CHARGES	26	50	50
2029	TELEPHONE	0	300	300
2031	ADVERTISING	0	0	0
2030 & 2032	POST & STATIONERY	0	50	50
2033	COMPUTER SOFTWARE	0	0	0
2039	HIRE OF EQUIPMENT	21,700	11,240	4,340
2040	PROTECTIVE CLOTHING	0	300	300
2041	BLINDING MATERIALS	0	0	0
2035 & 2048	FEES & LEGAL FEES	9,353	15,000	12,500
2054	FUELS & OILS	5,597	5,000	4,000
2060	TRAVEL & SUBSISTENCE	0	1,000	1,000
2061 & 2145	TRANING & CONFERENCES COURSES	0	750	750
2070	CHEMICALS	0	2,000	2,000
2072	WATER	59	1,000	500
2073	SITE ENGINEERING	0	2,000	2,000
2081	LANDFILL TAX ON BLINDING	0	0	0
2104	SAMPLES	10,603	14,280	19,200
2300	MISCELLANEOUS	0	100	100
8100	BAD DEBT WRITE-OFF/RECOVERED	0	0	0
8102	PROVISION FOR BAD DEBT	0	0	0
	2 Total	132,559	200,020	184,748
	Grand Total	132,559	66,763	95,050

21047

Northern Ireland Landfill Capacity Report

V00

Waste & Engineering

We have been involved in waste management and waste facility developments for more than 50 years.



Report

TITLE	Northern Ireland Landfill Capacity Report
PROJECT	21047
CLIENT	Mid Ulster District Council
DATE	January 2022
STATUS	FINAL
VERSION	00
AUTHOR	Kerry Brogan

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1 Introduction

Taggarts have been appointed by Mid Ulster District Council to undertake a study into future landfill capacity in Northern Ireland. This is the third review of Northern Ireland landfill capacity which allows a tracked comparison of changes in the market.

Northern Ireland has seen a change in the management of waste over the past 17 years, moving from landfill disposal of waste to the recycling and composting of appropriate wastes with a large volume of the residual waste sent for processing and energy recovery.

Even with the waste treatment and processing solutions currently delivered and proposed by the private and public sector it is acknowledged that there will still be the need for non-hazardous landfill capacity in Northern Ireland to deal with material that cannot be recovered.

The purpose of this report is to look at the existing landfill capacity in Northern Ireland and assess the potential future capacity requirements.

2 Scope of the Study

The scope of this study is to assess:

1. Current landfill capacity;
2. The latest reported volume of waste landfilled;
3. Northern Ireland future landfill capacity looking at a number of scenarios such as the early closure of Local Authority owned sites, the potential implementation of the arc21 EfW facility (Beacon), potential waste growth and statutory recycling targets;
4. Identification of potential sites for development; and
5. Ranking of potential development sites based on a series of criteria.

3 Policy Context

3.1 Introduction

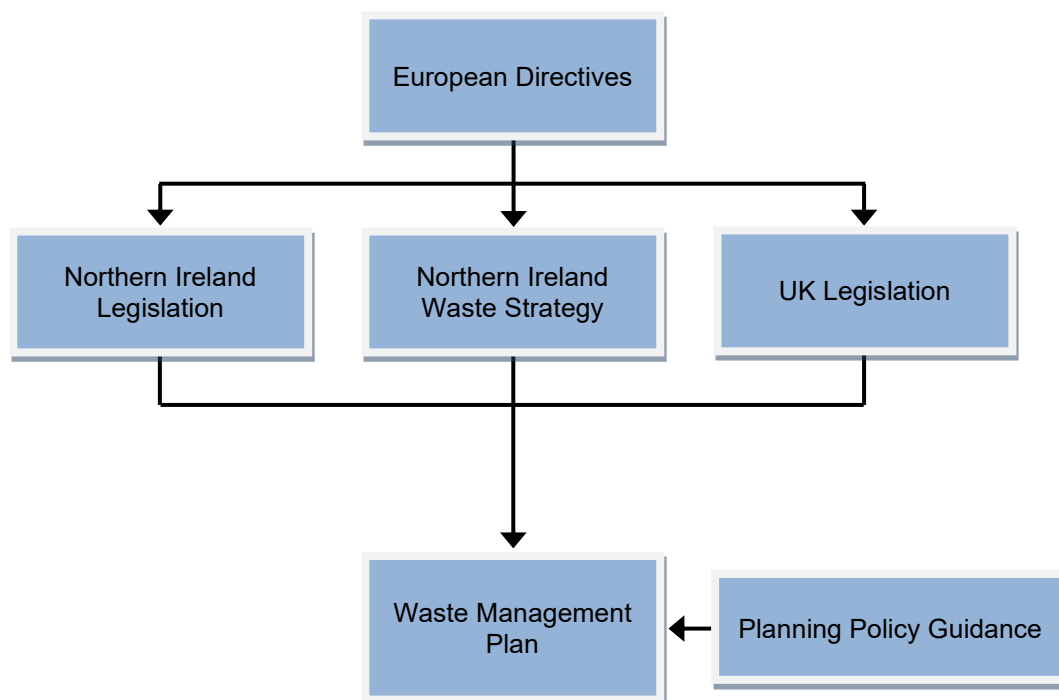
Current and future waste management activities are influenced by the legislative and policy framework in Northern Ireland. This includes EU waste policy which aims to reduce the environmental and health impacts of waste and improve resource efficiency. The majority of waste policy and guidance is based on EU Directives which are then translated into National legislation and policy within certain timescales.

Waste legislation in Northern Ireland is implemented in three levels, comprised of European Union Directives, UK wide legislation and Northern Ireland specific legislation and policy (Northern Ireland Orders, Regulations and national planning guidelines). In Northern Ireland, EU Directives are implemented through primary and secondary legislation. Primary legislation includes Orders and Acts and secondary legislation includes Regulations and planning guidelines.

This Section provides an overview of current and anticipated waste policy and legislative measures in order to identify and understand the key issues that need to be taken into account when assessing landfill capacity requirements.

The overall place and strategic influence of EU policy in the legislative and policy framework in Northern Ireland is set out in Figure 3.1 below.

Figure 3.1 Legislative and Policy Framework



It should be stressed that this Section provides a simple overview of waste policy and legislation. It is not exhaustive and does not detail every piece of legislation or every policy measure.

3.2 Current EU Waste Policy and Legislation

The EU gives strong direction to its member states on waste issues and much of UK and NI waste policy and guidance is based on EU legislation. EU waste policy and legislation had an initial focus in putting in place measures to manage and control waste and this led to the adoption of the Waste Framework Directive (75/442/EEC) in 1975. This, together with the Hazardous Waste Directive, which was also originally adopted in 1975, and the Waste Shipment Regulation (Regulation (EEC) 259/93) put in place the regulatory framework for waste. These pieces of legislation define waste, and other fundamental concepts including licensing, and put in place controls for the handling and movement of waste, to prevent damage to the environment or human health.

Recycling, re-use and energy recovery, in preference to the disposal of waste came with the 1996 Waste Strategy Communication from the European Commission which:

- Reinforced the Waste Hierarchy.
- Re-affirmed the 'polluter pays' principle for waste; and
- Developed the concept of Priority Waste Streams.

The Thematic Strategy on the Prevention and Recycling of Waste is one of the seven thematic strategies programmed by the Sixth Community Environmental Action Programme which was adopted by the European Commission on 21 December 2005. The Strategy confirmed the need to shift direction in order to meet the challenges of the future in delivering a sustainable approach to waste and resource management. The Strategy noted the need to assess the existing definitions of recovery and disposal, the need for a generally applicable definition of recycling and a debate on the definition of waste.

Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 on waste established the legislative framework for the handling of waste. It defines key concepts such as waste, recovery and disposal and puts in place the essential requirements for an establishment of waste management operations to have a permit or to be registered and placed an obligation for member States to prepare waste management plans. Furthermore is also established principles such as an obligation to handle waste in a way that does not have negative impacts on the environment or human health, an encouragement to apply the waste hierarchy and, in accordance with the polluter-pays principle, a requirement that the costs of disposing of waste must be borne by the holder of waste, by previous holders or by the producers of the product from which the waste came.

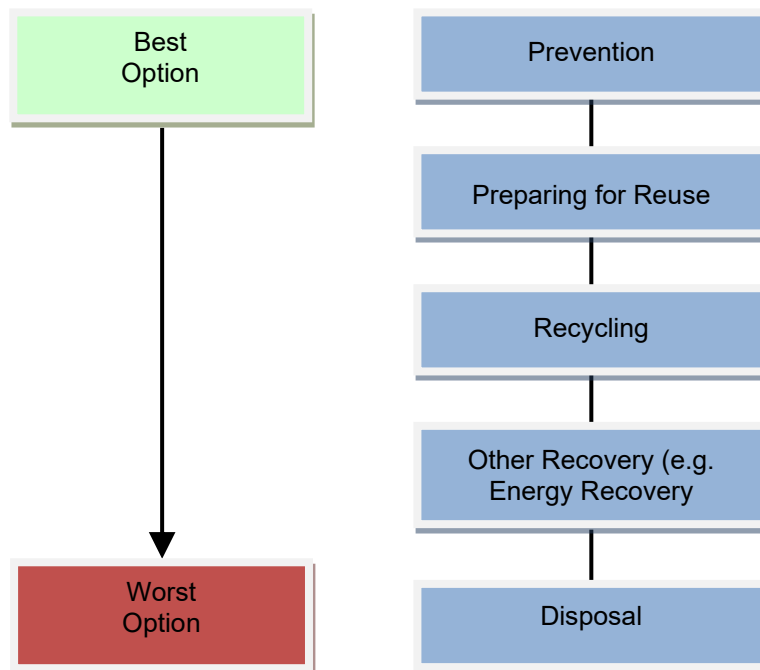
The outcome of the Thematic Strategy on the Prevention and Recycling of Waste resulted in the revision of the Waste Framework Directive.

3.2.1 Revised Waste Framework Directive (WFD)

The Waste Framework Directive (2008/98/EC) is the overarching legislative framework and is of particular significance to the study. It provides a foundation for sustainable waste management practice and defines waste. This Directive, which was adopted on the 19th November 2008, sets out measures to minimise the negative effects of the generation and management of wastes on human health and the environment and aims to reduce the use of resources. This Directive also repealed the directive on Waste Disposal (75/439/EEC).

A key component of the revised WFD is the new Waste Hierarchy, the primary purpose of which is to, minimise adverse environmental effects from waste and to increase resource efficiency in waste management and policy. Article 4 of the WFD sets out the new Waste Hierarchy as a priority order for waste management, as set out in Figure 3.2 below.

Figure 3.2 Waste Management Hierarchy



Waste prevention is set out as the most favourable option even though it is not technically a waste measure, as it occurs before a material becomes waste. However, the reduction of waste through reuse or other policy initiatives is a key objective of turning waste into a resource. Preparing for Reuse has also been included in the new Waste Hierarchy above Recycling with the aim of also improving resource efficiency.

When applying the Waste Hierarchy the WFD states that measures should be taken to encourage the options that deliver the best overall environmental outcomes.

In order to move towards a recycling society with a high level of resource efficiency the revised WFD also implements new targets for the reuse and recycling of materials.

- To achieve a recycling rate of 50% (including preparing for reuse) of household waste by 2020.
- To achieve a recovery rate of 70% (including preparing for reuse, recycling and other materials recovery) for all non-hazardous construction and demolition waste by 2020.

The revised WFD also specifies the requirement for waste management plans and strategies to be established which set out the current waste management situation, as well as the measures to be taken to improve reuse, recycling, recovery, and disposal of waste.

The revised WFD sets out measures that Member States may implement in order to extend Producer Responsibility and to strengthen the reuse, prevention, recycling, and other recovery of waste. Member States may therefore take legislative or non-legislative measures to make sure that anyone who professionally develops, manufactures, processes, treats, sells, or imports products has extended producer responsibility. This may include an acceptance of returned products and of the waste that remains after products have been used, as well as the subsequent management of the waste and financial responsibility for such activities.

The requirements of the revised WFD have been transposed into Northern Ireland legislation through the Waste Regulations (Northern Ireland) 2011.

3.2.2 Circular Economy Package- 2020

The UK is committed to moving towards a more circular economy which will see resources in use as long as possible, extracting maximum value from them, minimizing waste, and promoting resource efficiency. The Circular Economy Package (CEP) introduces a revised legislative framework, identifying steps for the reduction of waste and establishing an ambitious and credible long-term path for waste management and recycling.

As such Northern Ireland is subjected to renewed recycling targets, as laid out below:

- 55% of municipal waste by 2025;
- 60% of municipal waste by 2030;
- 65% of municipal waste by 2035; and
- No more than 10% to landfill by 2035.

These targets have been transposed into national and local legislation through the Waste (Circular Economy) (Amendment) Regulations (Northern Ireland) 2020.

3.2.3 Landfill Directive

The aim of the Landfill Directive (99/31/EC) is to provide measures, procedures and guidance to prevent or reduce as far as possible the negative effects on the environment from landfill waste. This is to be implemented through changing the way waste is disposed and progress up the waste management hierarchy achieved, through the minimisation of waste being sent to landfill.

Key objectives of the Landfill Directive include:

- The categorisation of landfills as inert, non-hazardous and hazardous;
- Ban on the co-disposal of hazardous and non-hazardous waste;
- Ban on the disposal of tyres;
- Ban on the landfill of certain types of hazardous wastes such as clinical or infectious;
- Standard waste acceptance procedures, which include the treatment of waste prior to landfilling;
- Operating permits, including the provisions for closure and aftercare;
- Technical standards for the lining and capping of landfills;
- Practice pre-treatment of waste going to landfill; and
- Reduction in the amount of biodegradable waste sent to landfill.

The requirements of this Directive are implemented in Northern Ireland through the Landfill (Northern Ireland) Regulations, 2003 SR 297 (as amended) and the Landfill (Amendment) Regulations (Northern Ireland), 2011 SR 101.

3.2.4 Industrial Emissions Directive

The Industrial Emissions Directive (2010/75/EC) recasts seven existing EU Directives including the Waste Incineration Directive, the Integrated Pollution Prevention and Control (IPPC) Directive, Solvents Directive and Large Combustion Plants Directive.

The Directive aims to improve the interaction between the seven Directives that it will replace, as well as strengthening the provisions in them.

The current legislative framework uses the concept of "best available techniques" (BAT) for dealing with potential pollution. Under this, the conditions in each installation's permit have to be based upon the application of BAT relevant to the industry sector concerned.

The Directive gives more emphasis to BAT requirements and some activities become newly subject to IPPC, but the framework of the existing Directives as currently implemented in the UK remain otherwise mostly unchanged.

The Directive was implemented into UK law in January 2013 and is implemented in Northern Ireland through the Pollution, Prevention and Control (Industrial Emissions) Regulations (Northern Ireland), 2012.

3.2.5 Transfrontier Shipment of Waste Regulations

The Transfrontier Shipment of Waste Regulations 2007 as amended by the Transfrontier Shipment of Waste (Amendment) Regulations 2008 set out procedures for the movement of all waste materials within and outside the EU.

They are made in accordance with and deal with the enforcement of Regulation (EC) 1013/2006 on shipments of waste, which sets out details for the supervision and control of shipments of waste.

3.2.6 Environmental Impact Assessment Directive

The Environmental Impact Assessment Directive (85/337/EC), as amended by Directive 97/11/EC, concerns the impact of the development on the environment prior to the granting of planning permission for a proposed development.

This Directive is implemented in Northern Ireland through the Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 1999.

3.2.7 Environmental Liability Directive

The Environmental Liability Directive (2004/35/EC) aims to establish a framework of environmental liability based on the 'polluter-pays' principle, in order to prevent and remedy environmental damage.

This Directive applies to:

- Environmental damage, or the threat of any damage, from any of the following occupational activities;
 - operation of installations under Directive 96/61/EC, on integrated pollution prevention and control,
 - waste management operations,
 - discharges into inland surface waters,

- discharges into groundwater,
- discharge or injection of pollutants into surface water or groundwater,
- water abstraction and impoundment of water,
- manufacture, use, storage, processing, filling, release and transport of dangerous substances or preparations, plant protection products or biocidal products,
- transport of dangerous or polluting goods,
- operation of installations under Directive 84/360/EEC, on air pollution from industrial plants,
- any contained use or deliberate release of genetically modified organisms,
- transboundary shipments of waste,
- operation of storage sites in accordance with Directive 2009/31/EC, on the geological storage of carbon dioxide; and
- damage, or the threat of any damage, to protected species and natural habitats caused by any occupational activities not listed above.

The Directive is implemented in Northern Ireland through the Environmental Liability (Prevention and Remediation) Regulations (Northern Ireland) 2009 SR2009/252.

3.3 EU Thematic Strategies

Thematic Strategies have been developed to reorganise the legislation concerning the environment with an aim of simplifying the complex legislative package. Seven separate strategies have been developed. These strategies focus on key environmental impacts, three of which are relevant to waste management in Northern Ireland.

3.3.1 Thematic Strategy on the Prevention and Recycling of Waste-December 2005

This strategy is concerned with the environmental impact of emissions from poorly managed waste and inefficient consumption and production patterns. Additionally, the Strategy intends to encourage more recycling within Member States.

A report from the Commission to the European parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the Thematic Strategy on the Prevention and Recycling of Waste was completed in 2011. This Communication reviewed progress towards achieving the Strategy's objectives.

This communication concluded that the Strategy has played an important role in guiding policy development and that significant progress has been achieved on a number of fronts, particularly in the improvement and simplification of legislation, the establishment and diffusion of key concepts such as the waste hierarchy and life-cycle thinking, on setting focus on waste prevention, on coordination of efforts to improve knowledge, and on setting new European collection and recycling targets.

3.4 National and Local Policy and Legislative Context

3.4.1 Introduction

The framework within which waste facilities are developed is provided by specific legislative and policy measures which include:

- Waste Legislation - including UK legislation and Northern Ireland Orders and Regulations.
- Waste Management Strategy - setting out government's policy for the management of waste. Associated guidance provides clarification and information on aspects of waste management policy, and its implementation.
- Land Use Planning - Strategies, Area Plans and Planning Policy Statements.

It is the framework that implements the requirements of EU policy and Directives, as set out in above, at the regional level. This section therefore provides an overview of waste policy and legislation in place in Northern Ireland to consider those issues relevant to the study.

Waste legislation is a complicated issue, and this section seeks to provide a simple overview, summarising the key relevant legislative provisions of the main pieces of legislation.

3.4.2 Waste Management Policy

Northern Ireland Waste Management Strategy: Delivering Resource Efficiency-October 2013

The Strategy is a revision of the current Northern Ireland Waste Management Strategy: Towards Resource Management which was published in March 2006 and set the strategic direction for waste management in Northern Ireland at the time.

The Strategy moves the emphasis of waste management in Northern Ireland from resource management (with landfill diversion as the key driver) to resource efficiency, that is, using resources in the most effective way while minimising the impact of their use on the environment. This Strategy has a renewed focus on waste prevention (including reuse), preparing for reuse and recycling in accordance with the waste hierarchy, as set out in Figure 3.2.

The key principles of the Strategy are:

- Waste Hierarchy – indicates the relative priority of the different methods of managing waste.
- Life Cycle Approach – to take into account the overall impacts that an approach or service will have throughout its whole life, that is, from cradle to grave.
- Polluter Pays Principle – means that waste generators should pay the costs of providing services to manage their wastes.
- Proximity Principle – emphasises the need to treat or dispose of waste as close as practicable to the point of generation, the minimise the environmental impact of waste transportation
- Integration of Waste Streams – encouraging the development of waste management solutions that encompass all waste.

In agreement with the European Commission the definition of municipal waste in Northern Ireland has been broadened and this is reflected in the revised Strategy. The definition now includes waste from all households and all wastes of similar nature and composition to households, including commercial wastes, whoever collects it. Previously, the definition only included wastes which were collected by Councils, and these are now defined as Local Authority Collected Municipal Waste. These revised definitions are set out below.

- Municipal Waste – waste from households and other waste which is similar in nature to waste from a household. This includes Commercial and Industrial waste which is similar in nature to waste from a household.

- Local Authority Collected Municipal Waste – waste that is collected by, or on behalf of, a Council

The targets set out in the Strategy include:

Household Waste

- To achieve a recycling rate of 45% (including preparing for reuse) of household waste by 2015 (Programme for Government Target).
- To achieve a recycling rate of 50% (including preparing for reuse) of household waste by 2020.
- To achieve a recycling rate of 60% (including preparing for reuse) of Local Authority Collected Municipal Waste)

3.4.3 Waste Management Legislation

Primary Legislation

Waste and Contaminated Land (Northern Ireland) Order, 1997 SI 2778 (including Amendments)- November 1997

This Order was enacted into Northern Ireland legislation in March 1998 and largely incorporates European Waste Framework Directive 75/442/EEC and Amendments. The aim of the Order is to set out provisions relating to waste on land, the collection and disposal of waste, land contamination by pollution, the controlled use, supply or storage of prescribed substances and articles and the obtaining of information on potentially hazardous substances. The Order enacts provisions relating to the effective management of wastes including Duty of Care Regulations, Registration of Carriers, Waste Management Licensing, Hazardous Waste and Producer Responsibility.

The Order also included the requirement for a Waste Management Strategy to be developed for the recovery and disposal of waste in Northern Ireland, along with a Waste Management Plan to be prepared for each Council including appropriate arrangements for managing controlled waste arisings.

The Waste and Emissions Trading Act, 2003

The main aim of this Act is to meet European Landfill Directive objectives and develop a system for the disposal of biodegradable waste, including biodegradable municipal waste. Within this Act, Government have been allocated landfill allowances to distribute to waste disposal authorities on a yearly basis. Landfill allowances can be bought, traded, or sold to

allow targets to be met. The DAERA NI determine how much biodegradable municipal waste can be sent to landfill and it is the responsibility of the allocating authority to ensure that these levels are not exceeded.

Secondary Legislation

The Waste Regulations (Northern Ireland) 2011 SR 127-March 2011

These Regulations came into effect in April 2011 and implement the revised Waste Framework Directive. The Regulations apply the waste hierarchy as a priority order in waste prevention and management policy:

- Prevention;
- Preparing for re-use;
- Recycling;
- Other recovery (e.g., energy recovery); and
- Disposal.

The provisions relating to:

- The Waste Hierarchy, came into force on 8 October 2011; and
- The separate collection of at least paper, metal, plastic and glass will come into force on 1 January 2015.

These Regulations implement Directive 2008/98/EC, on waste (the revised Waste Framework Directive), in order to help achieve its overall objectives of:

- Protecting the environment and human health;
- Reducing waste and encouraging it to be used as a substitute for other non-renewable resources;
- Making sure the EU becomes a recycling society by applying the principles of:
 - Self-sufficiency,
 - Polluter pays, and
 - Proximity.

The Landfill Allowance Scheme (Amendment) Regulations (Northern Ireland) 2011

The Northern Ireland Landfill Allowances Scheme (NILAS) came into force on 1st April 2005 and applies to Northern Ireland only. They supplement the Waste and Emissions Trading Act,

2003 by making detailed provisions for the allocation, borrowing, transfer and monitoring of landfill allowances allocated to Councils.

The Landfill Allowances Scheme (Amendment) (Northern Ireland) Regulations, 2005 came into force on 1st March 2006 and provide an amendment to the Landfill Allowances Scheme whereby the level of penalty to which a Council is liable for failing to meet the landfill diversion targets is reduced from £200 per tonne, as specified in the Waste and Emissions Trading Act, 2003 to £150 per tonne.

The Landfill Allowances Scheme (Amendment) Regulations (Northern Ireland) 2009, No. 46 came into operation on 1 April 2009, amend the NILAS 2004 Regulations by reducing from 71% to 64% by weight (rounded up to the nearest tonne), the assumed amount of biodegradable municipal waste in an amount of collected municipal waste.

It should be noted that Defra has been in discussions with the European Commission in regard to changing the way in which the UK meets its landfill allowance targets. As a result of this, a consultation was issued in March 2010 with the aim of addressing the implications of changing the approach adopted by the UK in meeting the diversion targets. Key to this was a change in the way in which municipal waste is classified with plans proposed to broaden this definition to include most notably commercial or industrial wastes not collected by or in control of Councils. The implication of this was a significant increase in the amount of waste classified as municipal waste.

This would subsequently require a change to the targets for diverting BMW from landfill, although it has been stated that the Authority allowances will not be affected for the portion of the waste formally defined as municipal. In order to achieve this, there was a need for the UK to review the way in which obligations have been reported. It would appear that the current preferred option would be to measure the BMW content of the waste at the point at which it is landfilled, based on the tonnages of the waste and the European Waste Catalogue Codes to which the waste pertains.

In addition, consideration has been afforded to changing the approach adopted by the UK in meeting the targets. The proposals for this include additional landfill restrictions as well as using the statutory recycling targets and waste prevention plans within the revised Waste Framework Directive as drivers for change.

The Landfill Allowances Scheme (Amendment) Regulations (Northern Ireland) SR 2011/373 amend the Landfill Allowances Scheme (Northern Ireland) Regulations 2004 by providing for the use of the term "local authority collected municipal waste". The term "local authority collected municipal waste" was introduced to the Waste and Emissions Trading Act 2003

(c.33) (the “2003 Act”) by the Waste and Emissions Trading Act 2003 (Amendment) Regulations 2011 (S.I.2011 No.2499). The term is used in provisions relating to the setting up and operation of landfill allowance schemes and is distinguished from the use of the term “municipal waste” to describe the waste that must be diverted from landfills under Article 5(2) of Council Directive 1999/31/EC on the landfill of waste.

It is the Department’s view that NILAS will, in the short term at least, maintain an important role in contributing to reductions in BMW to landfill in line with the new EU landfill diversion targets.

Waste Management Licensing Regulations (Northern Ireland), 2003 and Amendments- November 2003

The Waste Management Licensing Regulations (Northern Ireland) 2003, which came into operation on 19th December 2003, implement the waste licensing requirements of the Waste and Contaminated Land Order. Northern Ireland Environment Agency is directly responsible for the implementation of these Regulations.

Under the 1997 Order, licenses will be required to authorise:

- The deposit of controlled waste in, or on, land;
- The disposal and treatment (including recovery) of controlled waste; and
- The use of certain mobile plant to control or treat controlled waste.

All facilities must be covered by a licence unless they hold Pollution Prevention and Control (PPC) permits (as is the case for incinerators and landfills) or they hold a registered exemption from licensing.

Transfrontier Shipment of Waste Regulations, 2007 SI 1711 (as amended)-June 2007

These Regulations enforce Regulation (EC) No 1013/2006 of the European Parliament and of the Council on shipments of waste.

These Regulations:

- Set out the competent authorities for the purposes of the Community Regulation.
- Requires the Secretary of State to implement a waste management plan that contains his policies on the bringing into, or dispatch from, the United Kingdom of waste for disposal.

- Requires the Secretary of State to consult on that plan and requires the competent authorities of dispatch and destination to object to shipments of waste that do not comply with that plan.
- Creates a number of offences in relation to the shipping of waste which breach and/or fail to comply with the requirements of the Community Regulation in relation to management of shipments such as shipments of waste to or from the United Kingdom to or from other member States, to exports of waste to and from the United Kingdom to third countries, to the transit of waste through the United Kingdom to and from third countries.
- Sets out the fees that will apply in Northern Ireland. Regulation 47 provides for competent authorities to recover the costs of take-back under Articles 22 and 24 of the Community Regulation.
- Sets out the procedure applicable to the application for an approval of a financial guarantee or equivalent insurance.
- Provides that the Regulations must be enforced by the competent authorities and sets out the enforcement powers of competent authorities, authorised persons and officers of Revenue and Customs.

The Controlled Waste Regulations (Northern Ireland), 2002 (as amended)-July 2002

These Regulations came into force on the 27 August 2002 and apply to Northern Ireland only. They allow Regulations to be made for the treatment of waste of any description and are made in accordance with the Waste and Contaminated Land (Northern Ireland) Order. The Regulations provide definitions of the wastes to be classified under household waste, commercial and industrial waste as well as classifying the types of household waste for which a collection charge may be made by Councils.

Pollution, Prevention and Control Regulations (Northern Ireland), 2003 SR46

The Pollution, Prevention and Control Regulations (Northern Ireland), 2003 establishes a regulatory system that employs an integrated approach to controlling the environmental aspects of industrial activities such as energy generation, metals, minerals, waste management of chemicals, textile treatment, food production and intensive farming. This system is designed to protect the environment as a whole through a single permitting process by promoting the use of clean technology using Best Available Techniques (BAT). These regulations were amended in 2004 and 2007 to include additional activities.

It should be noted that these regulations will be revoked and replaced on 14th January 2014 by the Pollution, Prevention and Control (Industrial Emissions) Regulations (Northern Ireland), 2012. These are discussed in further detail below.

Pollution, Prevention and Control (Industrial Emissions) Regulations (Northern Ireland) SR 2012 / 453

These new Regulations came into force in January 2013. They implement Directive 2010/75/EU on industrial emissions (integrated pollution, prevention and control) and incorporates a number of other EU measures on industrial pollution (including those on waste incineration, large combustion plant and solvent emissions). These new regulations will revoke the current Pollution, Prevention and Control Regulations (Northern Ireland), 2003 on 7th January 2014.

In particular, the regulations will require those facilities that recover, or undertake a mix of disposal and recovery of non-hazardous waste with a capacity exceeding 75 tonnes per day involving one or more of the following activities to operate under a Pollution Prevention and Control permit. With regard to waste management, these activities include:

- Biological treatment;
- Pre-treatment of waste for incineration or co-incineration;
- Treatment of slags and ashes; and
- Treatment in shredders of metal waste, including waste electrical and electronic equipment and end-of-life vehicles and their components.

Landfill Tax Regulations, 1996 and Amendments

The Landfill Tax Regulations outline various administrative procedures which relate to the operation of the landfill tax system, specifically the registration of those organisations that intend to make disposals covered by the tax and the payment of tax.

These Regulations came into force on 1st May 2004 and apply to England, Wales and Northern Ireland. They amend the Landfill Tax Regulations, 1996 by increasing the maximum credit that landfill site operators may claim against their annual landfill tax liability.

The Landfill Tax (Amendment) Regulations 2009 which come into force on 1st September 2009 revoke Part of the Landfill Tax Regulations 1996 which relates to temporary disposals of material on a landfill site and introduce a new requirement to give information and keep records in relation to information areas. Material on a landfill site which is not going to be disposed of as waste must be deposited in an information area until the Commissioners clarify the taxable status of the material.

The Landfill Tax (Prescribed Landfill Site Activities) Order 2009, which comes into force on 1st September 2009, prescribes certain activities which take place on a landfill site for the

purposes of the Finance Act. The effect of this is that the prescribed activities will be treated as disposals and will be subject to landfill tax. Three of the activities are the use of material to create or maintain temporary hard standing, the use of material to create or maintain a temporary screening bund and the use of material to create or maintain a temporary haul road. The Regulation provides for landfill tax to be re-credited when material has been used in one of these three ways and is subsequently used for site restoration.

3.5 **Waste Management Plans**

3.5.1 **Waste Management Plans**

The aim of the current 3 Waste Management Plans are to develop a waste management system that meets the region's needs and contributes to economic and sustainable development. The defined objectives of the Plans are as follows:

1. To develop treatment facilities and / or let contracts to meet the needs of the individual regions.
2. To minimise the amount of waste produced within the region.
3. To maximise resource efficiency.
4. To minimise environmental impacts.
5. To ensure, as a minimum, that the identified facilities and services are in place in time to enable district councils to meet their statutory targets and obligations.
6. To encourage regional self-sufficiency, as far as practicable and economical, within the Regions.
7. To ensure that the actions and measures identified in the Plan are:
 - a. Deliverable, with respect to timescales for implementation; and
 - b. Practical, building upon existing services and facilities within the region.
8. To identify and manage risks (financial, planning and contractual) in a systematic manner, to ensure that risks lie with those parties' best placed to manage them effectively.
9. To adopt a regional approach to the sharing of targets to ensure that Northern Ireland as a whole is able to meet its targets, with individual action and targets agreed for each Council, taking into account demographic factors, including spread of population and associated costs for the provision of services.

3.6 **Planning Policy**

3.6.1 **Shaping Our Future- Regional Development Strategy for Northern Ireland 2035**

Shaping Our Future: The Regional Development Strategy for Northern Ireland (RDS 2035 'Building a Better Future') was published in March 2012 and informs the spatial aspects of all

other strategies. It complements the Sustainable Development Strategy and highlights the contribution that recycling more waste and recovering energy from it can make to a reduction in carbon footprint and Greenhouse Gas Emissions (GHG).

The Strategy recognises that managing our waste is a significant part of how we treat our environment and highlights the need to manage waste sustainably. This will be achieved by applying both the waste hierarchy, introduced by the Waste Framework Directive, and the proximity principle when developing treatment or disposal facilities in order to minimise the environmental impacts of waste transport.

3.6.2 Northern Ireland Sustainable Development Strategy

The Northern Ireland Sustainable Development Strategy ('Everyone's Involved') was adopted by the Northern Ireland Executive in May 2010. The Strategy sets out the principles and strategic objectives to ensure socially responsible economic development while protecting the resource base and the environment for future generations.

The six strategic objectives of the strategy are:

- Building a dynamic, innovating economy that delivers the prosperity required to tackle disadvantage and lift communities out of poverty;
- Strengthening society such that it is more tolerant, inclusive and stable and permits positive progress in quality of life for everyone;
- Driving sustainable, long term investment in key infrastructure to support economic and social development;
- Striking an appropriate balance between the responsible use and protection of natural resources in support of a better quality of life and a better quality environment;
- Ensuring reliable, affordable and sustainable energy provision and reducing our carbon footprint; and
- Ensuring the existence of a policy environment which ensures the overall advancement of sustainable development in and beyond government.

4 Review of Existing Landfill Capacity

4.1 Assessment of Active Sites in Northern Ireland

Taggarts have extensive knowledge of the waste industry in Northern Ireland. This has been gained through our involvement in the majority of municipal and commercial and industrial waste infrastructure in Northern Ireland.

Using this knowledge, backed up by the NIEA public register of PPC Permitted sites, we have developed a list of active and recently closed landfill sites. The status of landfill sites in Northern Ireland is identified in Table 4.1.

Table 4.1 Status of Northern Ireland Landfill Sites

Landfill	Operator	Status
Drummee	Fermanagh and Omagh District Council	Active
Craigmore	Coleraine Skip Hire and Recycling	Active
Cottonmount	Biffa	Active
Aughrim	Clearway	Active
Mullaghglass	Alpha Resource Management	Active
Magheraglass	Mid Ulster District Council	Closed April 2017
Lisbane	Armagh Power Generation Ltd	Closed and Closure Plan implemented. Only receiving inert waste for restoration
Craigahulliar	Causeway Coast and Glen Borough Council	Active
Drumanakelly	Newry Mourne and Down District Council	Closed 2016
Tullyvar	Mid Ulster District Council	Mothballed/Capped 2020
Ballymacombs	Mid Ulster District Council	Mothballed/Capped
Crosshill	Eastwoods	Active
Aughnagun	Newry Mourne and Down District Council	Closed 2015

4.2 Assessment of Capacities and Input Rates

In order to undertake an assessment of the current remaining landfill capacities, waste input rates and total tonnage of waste landfilled in Northern Ireland, Taggarts lodged an Environmental Information Request with NIEA.

This Environmental Information Request included:

1. Reported remaining landfill capacities from the Annual Reports submitted in January 2021
2. Tonnage landfilled in each site during 2020; and
3. Total tonnage landfilled in Northern Ireland during 2020.

A summary of this information is presented in Table 4.2.

Table 4.2 Reported Landfill Capacities 2021

Landfill	Landfilled 2020 (t)	Remaining Capacity for 2021 (t)
Drummee	25,994	76,000
Craigmore	107,602	616,000
Cottonmount	71,454	3,440,000
Aughrim	67,357	2,500,000
Mullaghglass	294,129	128,000
Magheraglass	0	0
Lisbane	0	0
Craigahulliar	29,514	74,960
Drumanakelly	0	0
Tullyvar	0	0
Ballymacombs	0	37,600
Crosshill	60,535	377,040
Total	656,585	7,249,600

As can be seen from Table 4.2 at the start of 2021 there was approximately 7.2m tonnes of landfill capacity in Northern Ireland. The majority of this landfill capacity is held in two sites by two private sector operators, Cottonmount Landfill and Aughrim Landfill. This capacity has the potential to rise to 7.9m tonnes of waste if Phase 4 of Tullyvar was to be developed in the future.

Table 4.2 also highlights the current trend in the Local Authority owned and operated landfill sites going through a phase of early closure, with both Magheraglass and Drumanakelly receiving their last waste inputs in 2017 and 2016 respectively. This trend is further outlined

by the early closure of Aughnagun 2015 and the mothballing of Tullyvar in 2018 followed by closure in 2020.

Ballymacomb Landfill has been mothballed/capped and to date there is no viable reason to reopen and complete.

It is evident that there is a declining capacity in some of Local Authority owned landfills sites as well as a decline in overall operators.

5 Northern Ireland Future Landfill Capacity

In order to determine landfill capacity in Northern Ireland, Taggarts considered it necessary to look at this in two stages. The first is current filling rates up to 2023. This allows an assessment of when current sites will reach capacity and close.

The second step is an assessment of landfill capacity required post the 50% recycling target which was achieved by 2020 and the recycling targets as introduced by the Circular Economy Package involving a 55% recycling target by 2025 and a 60% recycling target by 2030. This assessment was projected up to 2030. This assessment allows a projection of landfill capacity for Northern Ireland allowing the identification of how landfill capacity will be affected by the above targets.

Finally, a sensitivity analysis has been completed on the post 2023 scenario. This sensitivity analysis assesses the impact of the arc21 energy from waste (EfW) (the Beacon Project), if it was to be developed. A sensitivity analysis has also been conducted to assess the impact of Northern Ireland maintaining the 2020 landfill rate and waste growth rate.

5.1 Assessment of Landfill Capacity 2021 – 2022

In order to calculate the future landfill capacity in Northern Ireland it was considered an important task to calculate when Local Authority and Privately owned landfill capacity would run out based on current landfilling rates.

In order to complete this assessment, it was predicted that waste landfilled would increase year on year by 1.3%. This assumption is based on the waste growth figure reported through WasteDataFlow for the years 2016/17, 2017/19, 2018/19, 2019/20, and 2020/21.

Table 5.1 highlights the Local Authority Collected Municipal Waste (LACMW) arisings and percentage growth rate for the above years.

Table 5.1 Reported LACMW Figures and Growth Rate

	2016/17	2017/18	2018/19	2019/20	2020/21	Average
Northern Ireland LACMW	985,994	977,817	990,233	998,985	1,031,169	
% Growth Rate	1.7	-0.8	1.3	0.9	3.2	1.3

The 1.3% waste growth figure was applied to an assessment of the waste landfilled at each site outlined in Table 4.2 as well as the reported total Northern Ireland landfill figure for 2020.

Based on the figures reported for LACMW landfilled (WasteDataFlow) and the total tonnage of waste landfilled (NIEA), it has been possible to calculate the tonnage of waste landfilled that is not LACMW. It has been assumed that this difference is associated with commercial and industrial (C&I) waste.

Table 5.2 LACMW and C&I Waste Tonnages

Waste Type	Tonnage Landfilled
LACMW	234,956
Commercial and Industrial	421,629*
Total	656,585

*Assumed C&I waste landfilled due to difference between overall landfill rate and LACMW landfilled

By comparison to the Northern Ireland Landfill Capacity Report 2016 there has been a decrease in the total weight of LACMW landfilled from 390,256t to 234,956t. C&I waste to landfill when compared to 2016 has increased from 304,161t to 421,629t. The overall tonnage landfilled has decreased from 694,417t to 656,585t.

The assumed and modelled overall landfill tonnage including both LACMW and C&I waste is presented in Table 5.3.

Table 5.3 Predicted Landfill Tonnages

Total	2020	2021	2022
Landfilled	656,585	665,777	675,098

An assessment was completed based on the above assumptions of waste growth, commercial and industrial waste and LACMW arisings landfilled, and the total tonnage of waste landfilled. The waste input rates in 2020 plus a 1.3% waste growth were assumed for the waste input rates to each landfill. The outcome of this assessment and the predicted years for closure for each landfill up to 2023 is presented in Table 5.4.

Table 5.4 Predicted Landfill Rates to 2023

Landfill	2021 Capacity ¹	2020 Landfilled	Year of Filling		Remaining Capacity for 2023 ²
			2021	2022	
Drummeem	76,000	25,994	26,322	26,653	23,025
Craigmore	616,000	107,602	108,958	110,331	396,712
Cottonmount	3,440,000	71,454	72,354	73,266	3,294,380
Mullaghglass	128,000	294,129	294,129	294,129	-460,258

Landfill	2021 Capacity ¹	2020 Landfilled	Year of Filling		Remaining Capacity for 2023 ²
			2021	2022	
Aughrim	2,500,000	67,357	68,206	69,065	2,362,729
Craigahulliar	74,960	29,514	29,886	30,262	14,812
Tullyvar	0	0	0	0	0
Ballymacombs	37,600		0	0	37,600
Crosshill	377,040	60,535	61,298	62,070	253,672

¹ As of 1st January 2021

² As of 1st January 2023

As each site closes there will be the need to direct waste to other active landfill sites. Based on the waste flow model and Table 5.4 it is possible to predict the tonnage of waste that will have to be diverted to other sites each year.

Due to Mullaghglass reaching capacity it is possible to predict the tonnage of waste that will have to be filled elsewhere up to 2023. This is presented in Table 5.5.

Table 5.5 Additional Waste Requiring Landfill Capacity

Total Capacity Required (t)
474,205

From the assessment outlined in Table 5.4 for post 2023 it is anticipated that all Local Authority owned landfill sites will be closed / mothballed.

Post 2023 the only sites with remaining active landfill capacity will be:

- Drummee (limited capacity);
- Cottonmount;
- Aughrim;
- Craigahulliar (limited capacity);
- Crosshill; and
- Craigmore

Based on the modelled assumptions, Drummee and Craigahulliar will have limited capacity post 2022 with circa 23,000 tonnes and circa 15,000 tonnes respectively for 2023. It should also be noted that Crosshill's planning and PPC Permit limits the waste acceptance to wastes excluding domestic, household and food wastes. The PPC Permit for the site does not permit EWC Code 20 03 01 Mixed Municipal Waste.

Based on the assessment of capacity at the end of 2022 there would be an estimated circa 5.9m tonnes of capacity for 2023. This capacity figure does not take account of the potential 650,000 tonnes (650,000m³ @1.0t/m³) of capacity if Phase 4 at Tullyvar was developed (Density value based on the infilling of fines from mechanical processing of residual waste post 2020). The future capacity in Phase 4 of Tullyvar is further considered in Section 6 and 7 of this report.

Post 2022 landfill capacity is summarised in Table 5.6.

Table 5.6 Post 2022 Landfill Capacity

Item	Capacity (t)
Remaining Capacity	5,908,725

As outlined above the capacity post 2022 will be held in 6 sites. Drummee and Craigahulliar have limited capacity post 2022 as shown in figure 5.4 for the remaining capacity in 2023. Crosshill is not permitted to directly accept domestic/household waste. This results in the majority of the landfill capacity being held in 2 private sector sites, Aughrim, Cottonmount.

It has been estimated based on current fill rates that Aughrim and Cottonmount will have circa 2.4m and 3.3m tonnes of capacity respectively for 2023. This figure does not take account of the additional waste that will require landfill capacity up to 2022 due to the closure of landfill sites.

If an assumption was made that this waste was landfilled in Cottonmount, then post 2020 the capacity of the Cottonmount landfill would be reduced to circa 2.7m tonnes.

As the majority of landfill capacity will be held by 2 sites and with decline in operators, this may have the potential to increase landfill gates fees for those parties looking to dispose of waste in landfill. A summary of the estimated landfill capacity post 2022 is provided in Table 5.7.

Table 5.7 Summary of Estimated Landfill Capacity Post 2022

Landfill	Remaining Capacity for 2023 (Post 2022) (t)
Drummee	23,025
Craigmore	396,712
Cottonmount	3,294,380
Aughrim	2,362,729
Craigahulliar	14,812
Ballymacombs	37,600

Landfill	Remaining Capacity for 2023 (Post 2022) (t)
Crosshill	253,672
Total	6,382,930
Additional Capacity Required due to Waste Diverted from Closed Sites	474,205
Revised Estimated Capacity	5,908,725

5.2 Assessment of Landfill Capacity Post 2022

5.2.1 Impact of Circular Economy Targets

The main impact on landfill capacity will be the decreasing volume of residual waste to be landfilled as a result of the Circular Economy Targets. Resulting from the Circular Economy Package, Northern Ireland is now subjected to renewed recycling targets, as laid out below:

- 55% of municipal waste by 2025;
- 60% of municipal waste by 2030;
- 65% of municipal waste by 2035; and
- No more than 10% to landfill by 2035.

A model was created to estimate the potential LACMW generation between 2020/21 and 2029/30. This model takes account of the current generation of LACMW and applies a 1.3% waste growth up to 2030. The model also applies the current Northern Ireland recycling rate at 50% recycling with the statutory 55% recycling rate applied by 2025 and 60% applied by 2030. Table 5.8 outlines the predicted LACMW and residual waste up to 2030.

Table 5.8 Predicted LACMW and Residual Waste

Year	Predicted LACMW (t)	Predicted Residual (t)
2020/21*	1,031,169	515,585
2021/22*	1,044,574	522,287
2022/23*	1,058,154	529,077
2023/24*	1,071,910	535,955
2024/25**	1,085,844	488,630
2025/26**	1,099,960	494,982
2026/27**	1,114,260	501,417
2027/28**	1,128,745	507,935
2028/29**	1,143,419	514,539

Year	Predicted LACMW (t)	Predicted Residual (t)
2029/30***	1,158,283	463,313

*Statutory 50% recycling rate

**Statutory 55% recycling rate

***Statutory 60% recycling rate

5.2.2 Assumption of all LACMW Post 2023 Pre-Treated

In order to derive a prediction of landfill capacity requirements, an assumption has been made that all LACMW is sent for pre-treatment post 2023. This is due to the closure of all but 2 Council owned landfill sites. Using the WasteDataFlow reported figures it has been assumed that 14.6% of LACMW sent for pre-treatment is not suitable for energy recovery and is landfilled. This percentage to landfill has decreased in the last two years from the 35% reported in the previous Northern Ireland Landfill Capacity 2019 Report.

A model was therefore created to assess the tonnage of waste to be landfilled post 2023 if all LACMW was pre-treated in MRF's with a 14.6% to landfill rate. The outcome of this model is presented in Table 5.9.

Table 5.9 Prediction of Landfill Tonnages if all LACMW is Pre-Treated

Year	Predicted Residual (t)	Predicted Landfill (t)
2020/21	515,585	515,585
2021/22	522,287	522,287
2022/23	529,077	529,077
2023/24	535,955	78,249
2024/25	488,630	71,340
2025/26	494,982	72,267
2026/27	501,417	73,207
2027/28	507,935	74,159
2028/29	514,539	75,123
2029/30	463,313	67,644

5.2.3 Estimation of C&I Waste Landfilled

Landfill capacity requirements cannot be viewed just in the context of what will be required for LACMW. C&I waste also represents a significant source of waste requiring landfill capacity. The published information on the Northern Ireland quantity of C&I waste is very limited, however this is believed to be similar in quantity to the tonnage of LACMW.

In order to calculate the tonnage of C&I waste an Environmental Information Request was lodged with NIEA. This Environmental Information Request sought details on the total volume of waste landfilled in 2020.

A known tonnage of LACMW waste was landfilled in 2020/21 (WasteDataFlow). The known tonnage of LACMW landfilled was subtracted from the total tonnage of waste landfilled. The difference in landfill figures was then assumed to be C&I waste.

The above calculation allowed a ratio of LACMW to C&I waste landfilled to be assumed. It has been assumed that 179.5% of the tonnage of LACMW landfilled will equate to the tonnage of C&I waste landfilled. By comparison to the Northern Ireland Landfill Capacity Report 2019, this percentage has increased from 139.5%.

The above calculation for C&I waste, as well as a 1.3% waste growth, was applied to calculate the tonnage of waste up to 2030.

The summary of the C&I waste landfilled up to 2030 is presented in Table 5.10.

Table 5.10 Prediction of C&I Waste Landfilled

Year	Estimated C&I Waste Landfilled (t)
2020/21	421,629
2021/22	426,941
2022/23	432,321
2023/24	437,768
2024/25	443,284
2025/26	448,869
2026/27	454,525
2027/28	460,252
2028/29	466,051
2029/30	471,924

5.2.4 Review of Capacity up to 2030

Taking into consideration the assumptions outlined in Sections 5.2.1 to 5.2.3 of this report, it is possible to estimate the landfill capacity requirements year on year from 2020 to 2030. Table 5.11 summaries the annual and total landfill capacity requirements for both LACMW and C&I waste between 2020 and 2030.

Table 5.11 LACMW and C&I Landfill Capacity Requirements

Year	LACMW Landfill (t)	C&I Waste Landfill (t)	Total Landfill Requirement (t)
2021/22	522,287	443,284	664,858*
2022/23	529,077	448,869	673,235*
2023/24	78,249	454,525	532,775
2024/25	71,340	460,252	531,592
2025/26	72,267	466,051	538,319
2026/27	73,207	471,924	545,130
2027/28	74,159	477,870	552,028
2028/29	75,123	483,891	559,014
2029/30	67,644	489,988	557,632
Total	2,078,937	4,634,422	5,154,583

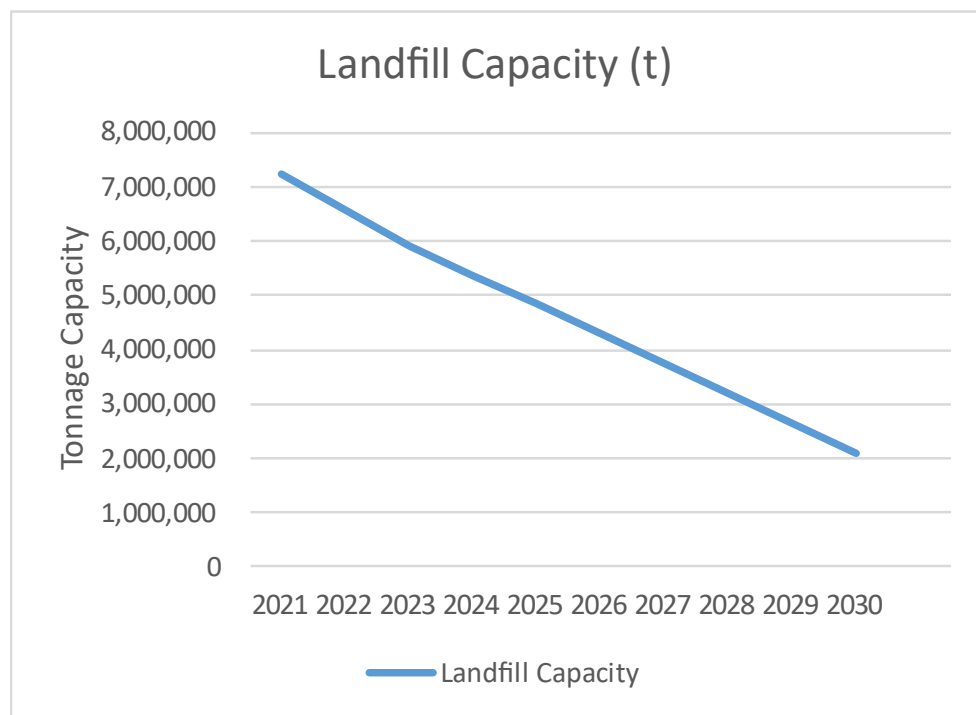
*Modified figures based on 2020 fill rates plus 1.3% waste growth rate. This is due to some councils already using treatment contracts.

Using the figures presented in Table 5.11 it is possible to calculate the declining landfill capacity and when a deficit in landfill capacity occurs. The predicted declining landfill capacity is presented in Table 5.12 and Figure 5.1.

Table 5.12 Declining Landfill Capacity

Year	Landfill Capacity (t)
2021	7,249,600
2022	6,584,742
2023	5,911,507
2024	5,378,732
2025	4,847,140
2026	4,308,821
2027	3,763,691
2028	3,211,663
2029	2,652,649
2030	2,095,017

Figure 5.1 Declining Landfill Capacity



As can be seen from Table 5.12 and Figure 5.1 it is predicted that a deficit in landfill capacity will not occur by 2030. The landfill capacity projected for the year 2030 is 2,095,017t. In comparison, the Northern Ireland Landfill Capacity Report 2019 had predicted a deficit in landfill capacity by 2028 with a shortfall in deficit at 379,793t.

5.3 Impact of arc21 EfW on Post 2022 Landfill Capacity

arc21 is the waste management group covering 6 Local Authorities in the east of Northern Ireland. arc21 is currently in a procurement process looking to deliver a Mechanical Biological Treatment facility and an incinerator with energy recovery at Hightown Quarry, Newtownabbey.

The implementation of the arc21 EfW will result in no LACMW to landfill due to the proposals including incineration and an incinerator bottom ash processing plant.

On 13th September 2017 the Department for Infrastructure granted planning permission for the development. However, the outcome of a Judicial Review on 14th May 2018 ruled that the granting of permission was unlawful in the absence of a minister.

The outcome of the Judicial Review has further delayed the project. The Northern Ireland Landfill Capacity Report 2016 modelled the impact of the arc21 project as a sensitivity analysis. This sensitivity analysis was modelled to have an impact from 2021/2022.

The arc21 sensitivity analysis was conducted again for this Landfill Capacity Report 2022 with a revised operational year of 2027/28 assuming the project will reach financial close in 2022 with a 5 year construction and commissioning phase. The impact was modelled on the landfill capacity up to 2030.

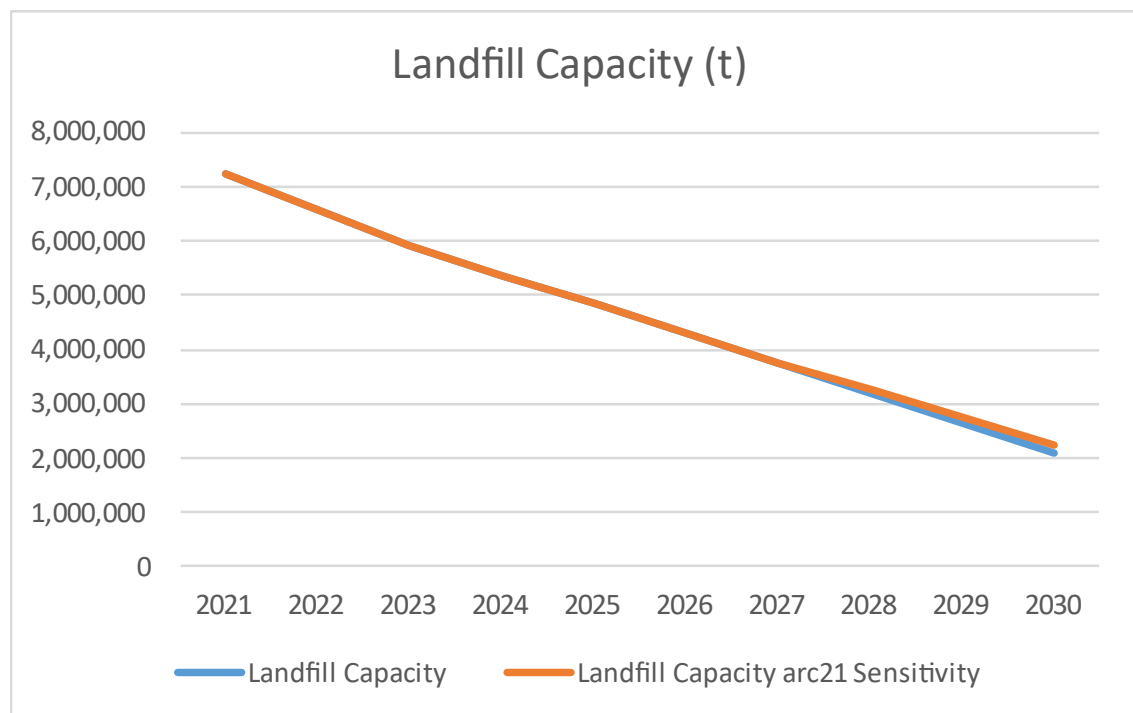
The impact that the arc21 EfW facility has on landfill capacity is presented in Table 5.13 and Figure 5.2.

Table 5.13 Impact of arc21 EfW on Landfill Capacity

Year	Landfill Capacity arc21 Sensitivity
2021	7,249,600
2022	6,584,742
2023	5,911,507
2024	5,378,732
2025	4,847,140
2026	4,308,821
2027	3,763,691
2028*	3,255,367
2029	2,740,625
2030	2,222,858

* arc21 operational

Figure 5.2 Impact of arc21 EfW on Landfill Capacity



As can be seen from Table 5.13 and Figure 5.2 under the arc21 sensitivity, a deficit in landfill capacity by 2030 is not predicted, therefore the arc21 sensitivity has a minimal impact on landfill capacity by 2030.

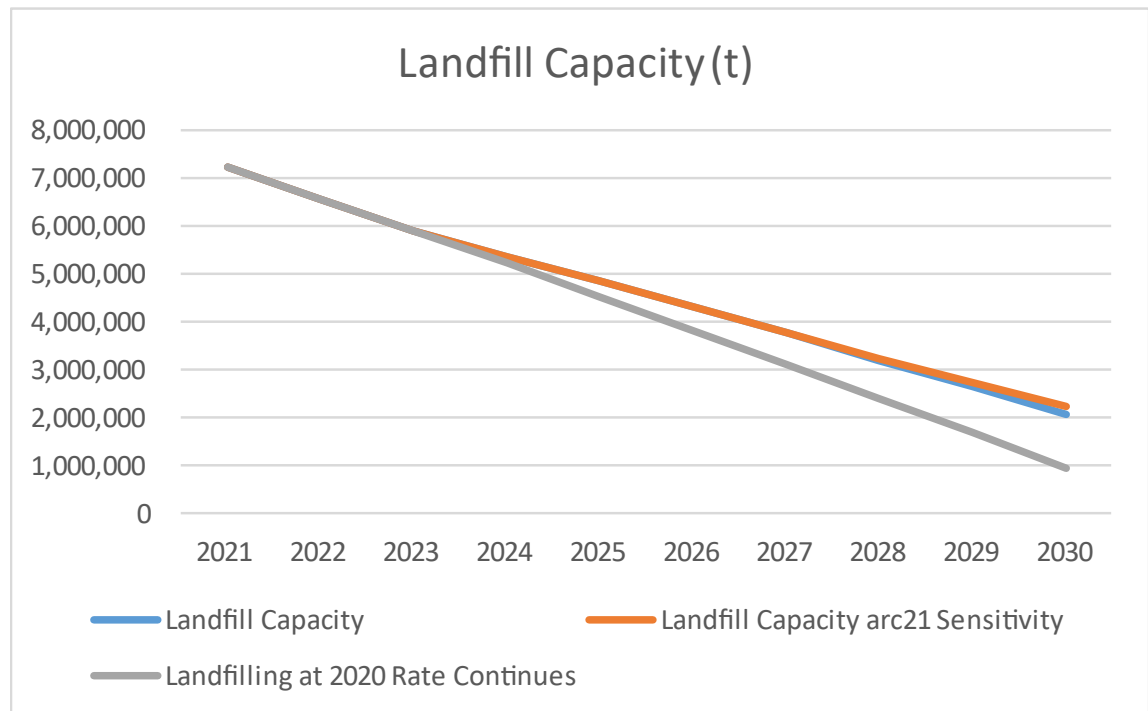
5.4 Impact of Continued Landfilling at 2020 Rate plus 1.3% Waste Growth Rate

A further sensitivity on landfill capacity was assessed. This sensitivity included the continuation of the 2020 landfilling rate with the current 1.3% waste growth rate. The impact of this scenario is presented in Table 5.14 and Figure 5.3.

Table 5.14 Impact of Continued Landfilling at 2020 Rate plus 1.3% Waste Growth Rate

Year	Landfilling at 2020 Rate Continues
2021	7,249,600
2022	6,584,742
2023	5,911,507
2024	5,229,789
2025	4,539,481
2026	3,840,476
2027	3,132,663
2028	2,415,932
2029	1,690,169
2030	955,263

Figure 5.3 Impact of Continued Landfilling at 2020 Rate plus 1.3% Waste Growth Rate



As can be seen from Table 5.14 and Figure 5.3 the implementation of a continued 2020 landfilling, and waste growth rate of 1.3%, results in 1.1m tonnes less capacity in 2030 than the model whereby all Local Authority waste is sent for pre-treatment in 2023.

6 Identification of Potential Development Sites

As highlighted in Section 5 of this report, post 2022 there will be limited competition in the landfill market with the majority of landfill capacity held between two privately owned sites, Aughrim and Cottonmount. Limited capacity will be held in Drummee and Craigahulliar post 2022 (circa 23,000 and 15,000 tonnes respectively in 2023) with circa 254,000 tonnes available at Crosshill which is not permitted to accept domestic/household waste.

RiverRidge Holdings Limited secured planning permission for an extension of the Craigmore Landfill Site, LA01/2018/1154/F dated 19th February 2019. This approval granted permission for an increase in height to the existing landfill as well as the creation of additional landfill cells which has now been constructed and has increased the previous capacity at the site. As of January 2021, this site had a remaining capacity of 616,000 tonnes.

Even with the increased capacity at Craigmore there will still only be a small number of landfill site operator's post 2022, all of which will be private sector. Therefore, there is the potential that landfill gate fees may increase.

An assessment has been created of potential sites that could be developed to provide additional capacity and prevent a lack of competition in the landfill market. Of the list below only 1 Local Authority site was considered due to the potential void and the consents that are currently in place.

1. Develop Phase 4 at Tullyvar;
2. Cam Road, Macosquin, development of the landfill site;
3. Ladyhill Quarry, Antrim, try and reinstate previous planning permission and PPC Permit for the non-hazardous landfill;

A high level assessment has been completed of the above options and is presented in Section 7 of this report.

7 Ranking of Proposed Development Sites

In order to provide a ranking of the most viable option for the development of future landfill capacity a pro's and cons assessment of the options identified in Section 6 of this report was undertaken.

This pros and cons assessment is presented in Tables 7.1 to 7.3.

Table 7.1 Assessment of Additional Void at Tullyvar

Pro's	Cons
<ul style="list-style-type: none"> ▪ Existing planning permission and PPC Permit for the development of Phase 4. ▪ Existing infrastructure such as leachate treatment plant, landfill gas engine, weighbridge and offices. ▪ Established grid connection for landfill gas engine. ▪ Established landfill site, therefore landfill principle established in the area. ▪ Significant void circa 650,000m³. Based on a density of 1t/m³ could represent a capacity of 650,000t. ▪ Well established wetlands for leachate treatment and discharge to surface water. 	<ul style="list-style-type: none"> ▪ May face local objection to continued operation as residents may have the opinion that the site is due to close, extended impact on residential receptors. ▪ CQA Plan to be submitted to NIEA detailing the design of Phase 4. ▪ Wetlands not designed to take leachate from Phase 4.

<ul style="list-style-type: none"> ▪ Council owned site therefore security in gates fees. 	
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*Density of 1t/m³ assumed based on the majority of waste infilled being MRF fines.

Table 7.2 Assessment of Additional Void at Cam Road

Pro's	Cons
<ul style="list-style-type: none"> ▪ Planning permission expiry 14th April 2016, however NIEA have released an update on landfill capacity in which they state the site has planning permission. ▪ Significant void circa 1.25m m³. Based on a density of 1t/m³ could represent a capacity of 1.25m t. ▪ NIEA report that this site is currently going through the permitting process. ▪ Close proximity to existing waste management facilities. 	<ul style="list-style-type: none"> ▪ Uncertainty in the capital development costs. ▪ May face local objection as residents may believe the site will not be developed due to the former developer going into administration (B Mullan and Sons Ltd). ▪ All infrastructure such as leachate treatment plant, landfill gas engine, weighbridge and offices would have to be constructed prior to waste acceptance. Significant capital expenditure prior to revenue generation. ▪ Uncertainty in ability to get a grid connection for a landfill gas engine.

*Density of 1t/m³ assumed based on the majority of waste infilled being MRF fines.

Table 7.3 Assessment of Additional Void at Ladyhill

Pro's	Cons
<ul style="list-style-type: none"> ▪ Significant void circa 3.2m m³. Based on a density of 1t/m³ could represent a capacity of 3.2m t. 	<ul style="list-style-type: none"> ▪ The site is believed to have Planning permission. ▪ PPC Permit has been revoked. A new PPC Permit application would be required. ▪ May face local objection as residents may believe the site will not be developed due to the potential expiration of planning. ▪ All infrastructure such as leachate treatment plant, landfill gas engine, weighbridge and offices would have to be constructed prior to waste acceptance. Significant capital

Pro's	Cons
	<p>expenditure prior to revenue generation.</p> <ul style="list-style-type: none"> Void is based on the steep wall of the quarry. Expensive steep wall lining system required. Road improvements required to widen Ladyhill Road to 6m in width. Expensive capital works. Uncertainty in ability to get a grid connection for a landfill gas engine.

*Density of 1t/m³ assumed based on the majority of waste infilled being MRF fines.

7.1 Final Ranking of Sites

Following the above high level pros and cons assessment it is considered that the ranking of most viable future landfill capacity would be as follows:

Table 7.5 Ranking of Sites

Ranking	Site	Comments
1 st	Tullyvar Landfill Site	<ul style="list-style-type: none"> Existing Planning Permission Existing PPC Permit Site Infrastructure in place Council control over landfill gate fees
2 nd	Cam Road Landfill Site	<ul style="list-style-type: none"> Reported that planning permission is still active Large void All infrastructure would have to be developed Development of a new landfill site in a new area
3 rd	Ladyhill Landfill Site	<ul style="list-style-type: none"> May need to confirm planning permission Expensive lining works required Large capital expenditure required for road upgrade

8 Conclusions

It is acknowledged that there will still be the need for non-hazardous landfill capacity in Northern Ireland to deal with material that cannot be recovered.

The waste hierarchy implemented through the Revised Waste Framework Directive and the Northern Ireland Waste Management Strategy places the following priority in waste management:

- Prevention;
- Preparing for re-use;
- Recycling;
- Other recovery (e.g. energy recovery); and
- Disposal.

However, it is accepted that landfill disposal is a key element of the waste management mix to deal with waste that cannot be recycled or disposed with energy recovery.

A waste flow model was created to assess the landfill capacity post 2022 based on the current filling of landfill sites and a 1.3% waste growth. This waste flow model identified that post 2022 the majority of landfill capacity will be held by 2 sites. Therefore, this may have the potential to increase landfill gates fees for those parties looking to dispose of waste in landfill.

The outcome of landfill capacity post 2022 is summarised in Table 8.1

Table 8.1 Summary of Estimated Landfill Capacity Post 2022

Landfill	Remaining Capacity for 2023 (Post 2022) (t)
Drummee	23,025
Craigmore	396,712
Cottonmount	3,294,380
Aughrim	2,362,729
Craigahulliar	14,812
Ballymacombs	37,600
Crosshill	253,672
Total	6,382,930
Additional Capacity Required due to Waste Diverted from Closed Sites	474,205

Landfill	Remaining Capacity for 2023 (Post 2022) (t)
Revised Estimated Capacity	5,908,725

A model was created to estimate the potential LACMW generated between 2020 and 2033. This model took into account a 1.3% waste growth up to 2033. In order to derive a prediction of landfill capacity requirements post 2022, an assumption has been made that all LACMW is sent for pre-treatment starting 2023/24, as all but 2 Local Authority landfill sites will be closed. Using the WasteDataFlow reported figures it is evident that 14.6% of LACMW sent for pre-treatment is not suitable for energy recovery and is currently landfilled. A calculation of C&I waste was also completed to estimate the required landfill volume for this waste stream. This calculation outlined that 179.5% of the tonnage of LACMW landfilled will equate to the tonnage of C&I waste landfilled.

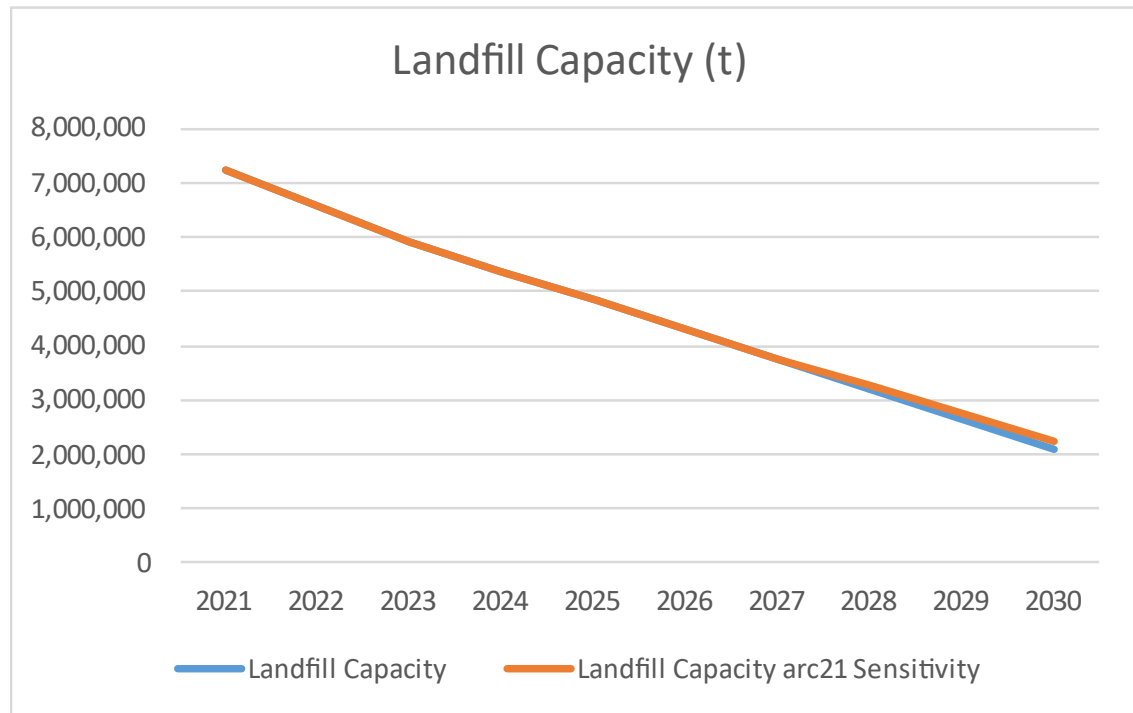
Using the above inputs to a waste flow model the 2020 to 2030 landfill capacity requirements have been estimated. The landfill capacity requirements are presented in Table 8.2 and Figure 8.1.

A sensitivity analysis was applied to the landfill capacity requirements in terms of the development and operation of the arc21 EfW facility. The impact of this sensitivity is presented in Table 8.2 and Figure 8.1.

Table 8.2 Declining Landfill Capacity Assessment

Year	Landfill Capacity (t)	Landfill Capacity arc21 Sensitivity (t)
2021	7,249,600	7,249,600
2022	6,584,742	6,584,742
2023	5,911,507	5,911,507
2024	5,378,732	5,378,732
2025	4,847,140	4,847,140
2026	4,308,821	4,308,821
2027	3,763,691	3,763,691
2028	3,211,663	3,255,367
2029	2,652,649	2,740,625
2030	2,095,017	2,222,858

Figure 8.1 Declining Landfill Capacity



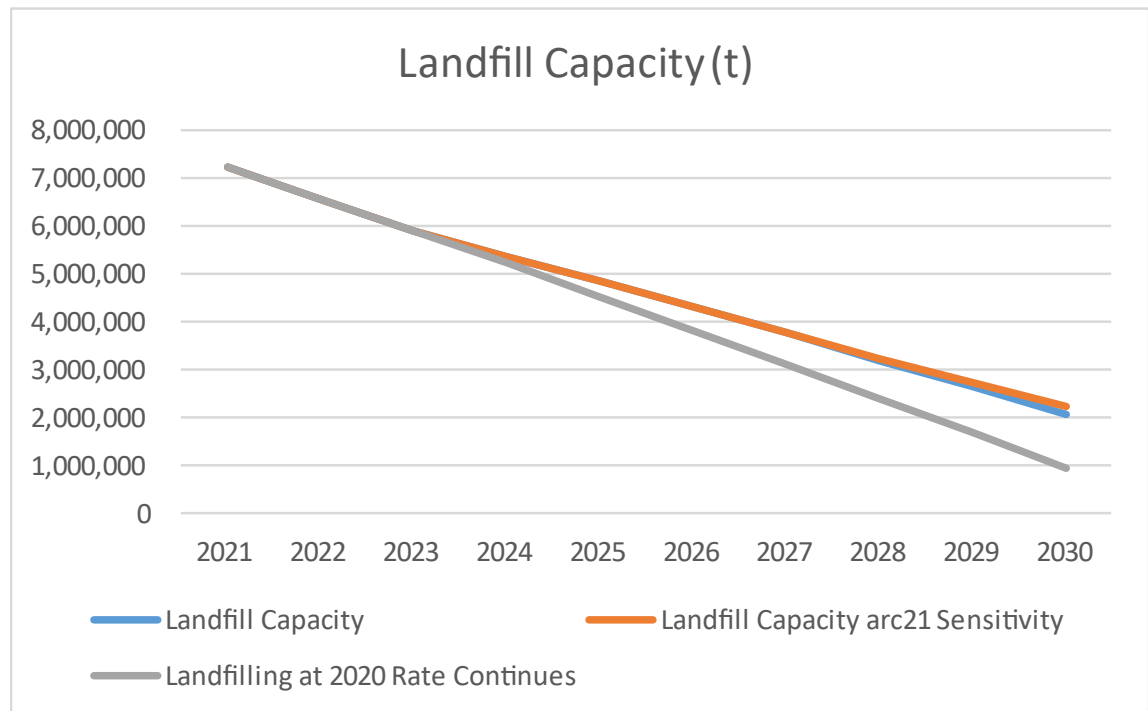
As can be seen from Table 8.1, 8.2 and Figure 8.1, the pre-treatment and arc21 sensitised models have a minimal impact on landfill capacity in 2030.

A further sensitivity on landfill capacity was assessed. This sensitivity included the continuation of the 2020 landfilling rate with the current 1.3% waste growth rate. The impact of this scenario is presented in Table 5.14 and Figure 5.3.

Table 8.3 Impact of Continued Landfilling at 2020 Rate plus 1.3% Waste Growth Rate

Year	Landfilling at 2020 Rate Continues
2021	7,249,600
2022	6,584,742
2023	5,911,507
2024	5,229,789
2025	4,539,481
2026	3,840,476
2027	3,132,663
2028	2,415,932
2029	1,690,169
2030	955,263

Figure 8.2 Impact of Continued Landfilling at 2020 Rate plus 1.3% Waste Growth Rate



As can be seen from Table 5.14 and Figure 5.3 the implementation of a continued 2020 landfilling and waste growth rate again has a minimal impact on landfill capacity by 2030.

Given the potential lack of competition in the landfill market post 2022 it is considered that landfill gate fees may rise.

RiverRidge Holdings Limited secured planning permission for an extension of the Craigmole Landfill Site, LA01/2018/1154/F dated 19th February 2019. This approval granted permission for an increase in height to the existing landfill as well as the creation of additional landfill cells which has now been constructed and has increased the previously reported capacity. As of January 2021, this site had 616,000 tonnes of capacity remaining.

Even with the increased capacity at Craigmole there will still only be a small number of landfill site operator's post 2022, all of which will be private sector. Therefore, there is the potential that landfill gate fees may increase.

A study of the most viable future landfill capacity was completed using a high level pros and cons assessment. This assessment considered that the ranking of most viable future landfill capacity would be as follows:

1. Tullyvar Landfill Site – due to the existing Planning Permission and PPC Permit with site infrastructure in place. This option could also offer Councils control over landfill gate fees.
2. Cam Road Landfill Site – it is reported that planning permission is still active for the site with the site having a significant void capacity. However, all infrastructure would need to be developed at this site.
3. Ladyhill Landfill Site – planning permission may still be active for the site. The development of the site would include expensive lining works due to the steep wall of the quarry. A large capital expenditure would also be required to upgrade the road to the site.

There is the potential for all Local Authority landfill sites to be closed in the early to mid 2020's. This will result in all landfill capacity being controlled by the private sector. If landfill gate fees were to rise due to only a small number of operators in the market, it is our view that competition in the market would develop.

In order to protect Local Authorities from the potential rise in landfill gate fees it is considered that the most viable option for future landfill capacity would be the remaining capacity at Tullyvar Landfill Site. This would be the preferred site due to the infrastructure that is currently in place such as the welfare facilities, leachate treatment plant, wetlands, and landfill gas infrastructure. Therefore, the development costs of landfill capacity at Tullyvar verses Cam Road and Ladyhill would be substantially lower.

However, from the modelling conducted, currently there is no reason to reopen Tullyvar Landfill at this point in time due to the following;

- Circular Economy targets increasing the recycling rate to 55% by 2025, 60% by 2030, 65% by 2035, and no more than 10% of municipal waste to landfill by 2035. This will result in a continued decreasing volume of residual waste to be landfilled.
- Technology has significantly advanced over the past 10 years with the rise of automation, artificial intelligence and near infra optical sorting. These advances in technology have improved recovery rates of materials recovery facilities. Such improvements in technology have resulted in less residual waste from dirty MRF processes that need to go to Landfill (35% to 14.6%).
- Treatment contracts – due to the decline in Local Authority landfill sites those Councils that historically relied on landfill will now have consider residual waste treatment contract.
- Extension of Craigmole Landfill offering an additional 616,000 tonnes of landfill capacity in January 2021.
- Modelled projections show no deficit in landfill capacity by 2030.

This should however be kept under continuous review with regards to future waste growth and landfill capacity to assess if reopening Tullyvar is required.

It is recommended that a bi-annual review of landfill gate fees is undertaken to assess the landfill market and any potential risks associated with landfill gate fee increases.

9 Recommendations

Tullyvar represents the most viable future landfill capacity in the event of landfill gate fees increasing due to lack of competition in the market. The requirement for reopening Tullyvar should be under continuous review. The decision to proceed with the development of phase 4 at Tullyvar can be again ratified following the outcome of the 2024 landfill capacity report, if this report identifies a significant decrease in landfill capacity with a significant increase in landfill gate fees.

It is recommended that this landfill capacity review is completed every 2 years in order to assess the future landfill capacity and any impacts that new technologies / processes may have on the volume of waste landfilled.

It is recommended that reviews of this landfill capacity study are completed on the total volume of waste landfilled in 2022 and 2024.

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