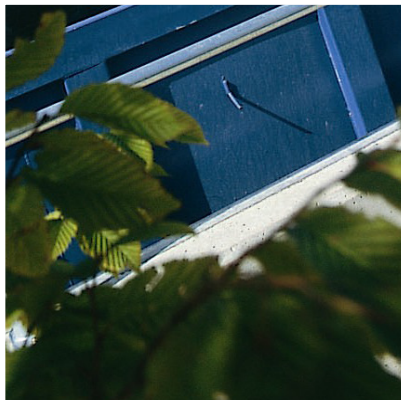
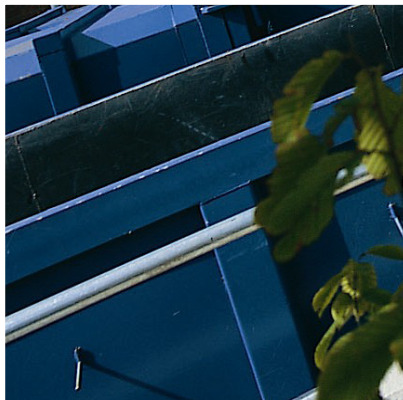
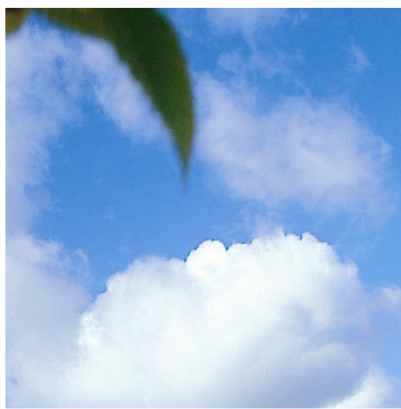
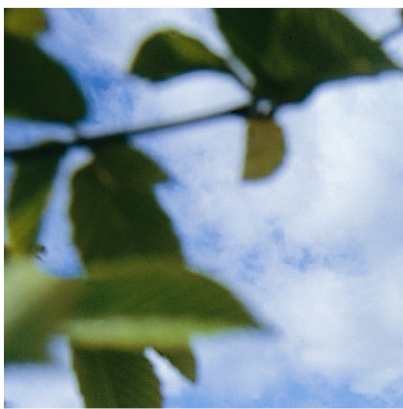


# NWRWMG Residual Waste Project

## Civic Amenity Site Commingled Waste Compositional Analysis

IBR0109 / 20 January 2010





## **NORTH WEST REGION WASTE MANAGEMENT GROUP**

### **NWRWMG RESIDUAL WASTE PROJECT**

**JANUARY 2010**

**CIVIC AMENITY SITE COMMINGLED**

**WASTE COMPOSITIONAL ANALYSIS**

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## **1.0 INTRODUCTION**

### **1.1 OVERVIEW**

RPS Consulting Engineers were commissioned by North West Region Waste Management Group (NWRWMG)<sup>1</sup> in June 2009, to carry out a compositional analysis study on the commingled waste fraction collected at Civic Amenity (CA) Site throughout the NWRWMG.

Waste compositional/component analysis is a systematic approach to obtaining and analysing data from waste streams whereby the composition of waste according to the products and materials contained therein is obtained by manually sorting the waste. This is the first commingled waste compositional analysis study for NWRWMG.

### **1.2 NWRWMG RESIDUAL WASTE INFRASTRUCTURE PROJECT**

The NWRWMG is currently procuring waste infrastructure to treat municipal waste that has not been reused, recycled or composted. It is the intention to procure a private sector partner to design, build, operate, maintain and possibly finance facilities to treat residual or so called black bin waste and to provide associated services (including but not limited to the management, transport, sale and/or disposal of outputs from any such facilities). Other ancillary or associated infrastructure may also be required. These waste treatment facilities are intended to facilitate the diversion of significant quantities of municipal solid waste from landfill to assist in meeting targets under the NILAS Scheme and other legal requirements, in accordance with the Waste Management Plan.

It is currently envisaged that the NWRWMG will have a requirement for:

- (a) Mechanical Biological Treatment (MBT) facilities with a capacity of circa 140,000 tonnes of municipal waste per annum.
- (b) Energy Recovery Facilities with sufficient capacity to treat the appropriate MBT outputs.

The NWRWMG identified the need to obtain information on the composition and characteristics of the commingled waste collected at CA Sites in the NWRWMG in order to

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<sup>1</sup> The NWRWMG represents a voluntary grouping of seven local authorities in Northern Ireland. The membership of NWRWMG is comprised of a number of Constituent Councils which have formed this grouping expressly for strategic waste planning purposes. These Constituent Councils are currently as follows: Ballymoney Borough Council, Coleraine Borough Council, Derry City Borough Council, Limavady Borough Council, Magherafelt District Council, Moyle District Council and Strabane District Council.

provide regional specific information to bidders during the procurement process and assist in informing the decision making process.

### **1.3 COMMINGLED WASTE**

The commingled waste collected at local authority civic amenity sites in the NWRWMG is currently sent to a dirty Materials Recovery Facility to further increase recycling and diversion from landfill.

The district councils report their municipal waste arisings data, on a quarterly basis, through a national on-line database called WasteDataFlow [www.wastedataflow.co.uk](http://www.wastedataflow.co.uk), which is owned and operated by The Department of Food and Rural Affairs (Defra) in partnership with the UK's devolved administrations. Analysis of waste data and waste flows during the Pre Qualification Questionnaire Stage and Invitation to Participate in Dialogue incorporating Invitation to Submit Outline Solutions Stage highlighted that further analysis of the commingled waste stream was necessary as the local authorities have only recently begun to report this waste stream separately in the WasteDataFlow returns. Therefore as part of the waste compositional analysis study of the commingled waste stream from CA Sites RPS conducted a number of site visits and reviewed the waste data available. Further details are provided in Section 3.0

Currently six out of the seven District Councils in the NWRWMG send commingled waste collected at CA Sites for processing to either of two private waste contractors in the region. At these facilities a certain proportion of the waste is recycled with the remaining commingled waste sent to landfill. The commingled waste stream collected in the CA Sites in Strabane District Council currently goes straight to landfill.

### **1.4 AIM OF THE STUDY**

This study is a compositional analysis of commingled waste collected in the NWRWMG. The composition of the commingled waste at seven Civic Amenity (CA) Sites throughout the NWRWMG has been obtained by the physical hand sorting of the waste. The main aim of the project was two-fold:

1. To determine the composition of commingled in NWRWMG; and
2. To review the percentage of commingled waste which is biodegradable.

### **1.5 REPORT CONTENT**

This report content and structure is as follows:

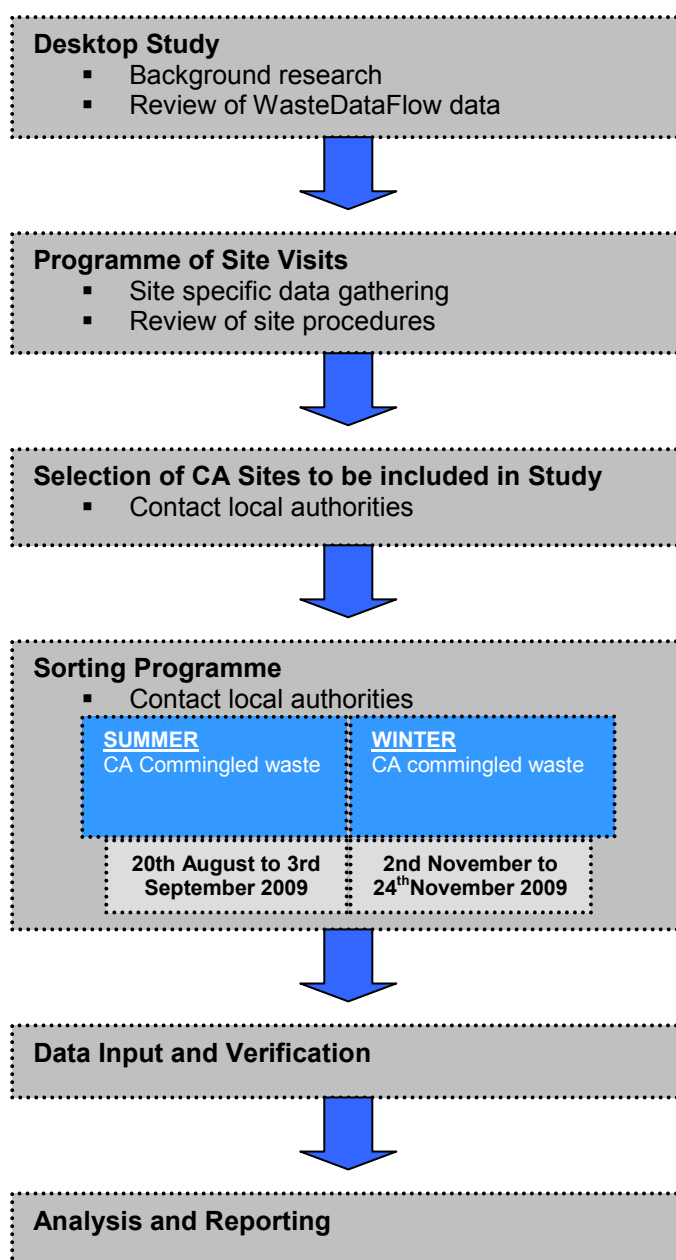
- Section 2 summarises the methodology adopted for the analysis, including information on the collection and sorting of the waste and statistical analysis of the data.
- Section 3 presents information on the commingled waste stream obtained from Waste Data Flow that have been used during this Study
- Section 4 presents the main results of the analysis including the compositions of commingled waste stream.
- Section 4 details our conclusions to NWRWMG.



## 2.0 METHODOLOGY

### 2.1 OVERVIEW

This section of the report details the methodology employed to undertake the waste compositional analysis and therefore meet the objectives of the project. The project required waste to be collected and physically sorted from CA Sites from the seven NWRWMG District Councils. Figure 2.1 below sets out an overview of the project methodology.



**Figure 2.1 CA Site Waste Composition Methodology Overview**

## 2.2 DESKTOP STUDY

Currently there are twenty six CA Sites operating in the NWRWMG which are detailed in Table 2.1 below.

**Table 2.1 Civic Amenity Sites in the NWRWMG**

Council	CA Site
Ballymoney Borough Council	Crosstagherty Knock Road
Coleraine Borough Council	Castlerock Garvagh Kilrea Loughanhill Industrial Estate Portstewart Portrush
Derry City Council	Brandywell Claudy Eglinton Glendermott Road Pennyburn Strathfoyle
Limavady Borough Council	Ballyquin Dungiven
Magherafelt District Council	Castledawson Draperstown Maghera Magherafelt
Moyle District Council	Carnealty
Strabane District Council	Carricklee Donemana Killen Newtownstewart Plumbridge

WasteDataFlow operational data for the period 2008/2009 was obtained and a number of clarifications sought from local authorities. Information in relation to the commingled waste data is contained in Section 3.0.

## 2.3 PROGRAMME OF SITE VISITS

In order to review the practices and current operations on sites in relation to the handling of commingled waste RPS conducted a number of CA Site visits. RPS undertook eleven CA

visits between the 14<sup>th</sup> and 15<sup>th</sup> of July 2009. Following these initial site visits it was noted that all local authorities accept either commingled and/or residual waste at Civic Amenity sites. Some authorities are sending all this material to the MRF, others are sending a proportion of it to the MRF and other amounts direct to landfill, while Strabane District Council sends all the material direct to landfill. Therefore from these initial site visits there appeared to be no consistent methodology throughout the group for managing the commingled and residual waste streams. Further site visits were undertaken on the 27th July 2009 to review current practices on the remaining CA Sites. Three sites within the Strabane District Council area, namely Newtownstewart, Plumbridge and Killen were not visited as they do not send the commingled waste stream to an MRF for recovery. In addition the Brandywell site in the Derry City Council area was closed for an extended period during the summer of 2009. Further details in relation to the findings of the CA Site visits are contained in Section 3.0.

## 2.4 SELECTION OF CA SITES

WDF operational data for the period 2008/2009 was reviewed for the purposes of selecting the CA Sites to be included in the Study. Furthermore discussions were held with technical officers from each District Council selected regarding the most representative and appropriate CA Site to sample. Supplementary data was provided by the District Councils to aid the selection process. One site from each of the seven NWRWMG District Councils was selected to be sampled as shown in Table 2.2.

**Table 2.2 CA Sites Sampled**

Council	CA Site
Ballymoney Borough Council	Crosstagherty
Coleraine Borough Council	Portstewart
Derry City Council	Glendermott Road
Limavady Borough Council	Ballyquin
Magherafelt District Council	Maghera
Moyle District Council	Carnealty
Strabane District Council	Donemana

## 2.5 EXECUTION OF SORTING PROGRAMME

The commingled waste materials that were sampled were those that entered the general skips that are subsequently sent to the dirty MRF for further segregation and recycling with a proportion disposed of to landfill. However as previously stated in the case of Strabane District Council, the commingled waste that is currently sent to landfill was sampled as the waste collected at the Strabane District Council site is similar to that collect at the other Council sites in the region.

It should be noted that the CA Site compositional audits did not take into account materials that are currently being composted or recycled as comprehensive data on materials recycled at CA Sites can be obtained from WDF returns and via the Northern Ireland Environment Agency Municipal Waste Management Northern Ireland – 2008/09.

A representative sub-sample of the waste collected at each site was obtained by setting aside a pre-determined skip for the survey that was filled by the public on the specified day of collection. The public were unaware of this study, ensuring their behaviour was not influenced in any way. Once full, the skip was collected by a waste carrier, registered under The Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations (Northern Ireland) 1999. Each waste sample collected was weighed and recorded prior to physical hand sorting at a licensed facility.

A representative sub-sample was achieved by coning and quartering the waste accepted at the CA Site. The waste was tipped out on a polythene tarpaulin or sorting table for segregation, separate containers were allocated for each predefined secondary waste category and placed in the correct sorting container. Waste was then picked off the tarpaulin by waste sorters and placed into the dedicated waste stream containers. Once full, each container was weighed and the data entered on to standard proformas and then transferred to an Excel database. Validation checks were carried out at this stage.

## **2.6 DATA INPUT, VERIFICATION, ANALYSIS AND REPORTING**

The “raw data” obtained from the compositional analysis was checked and further validated before the statistical analysis was conducted. The data was scaled up statistically in proportion to the commingled waste throughput for each local authority, further details are contained in Section 3.0.

### **2.6.1 Statistical Analysis**

When conducting a waste survey, the objective is to predict a characteristic (e.g. the make up of commingled waste produced per civic amenity per day in NWRWMG) of the whole population (in this case, all the civic amenity sites in NWRWMG) from our sample (the civic amenity sites studied during this survey). This is known as inferential statistics. We are therefore interested in two things;

- The inference; and
- A measure of its accuracy

The inference is simply a prediction about a specific parameter that is of interest to us (for example, the mean amount produced per civic amenity per day in NWRWMG) while the accuracy of the measurement is usually expressed in terms of confidence intervals.

### **2.6.2 Confidence Intervals**

The confidence interval is an expression of statistical accuracy. It provides the upper and lower limits of the “actual” population mean based on the sampled mean and variance of the observed sampled data. For example, sample mean for the waste category newspaper may be 5 % for a certain generator, with a confidence interval of +/- 1%. This implies that the true population mean for paper is between 4% and 6%.

### **2.6.3 Confidence Levels**

The probability that a confidence interval will enclose the estimated parameter is called the confidence level and is usually expressed as a percentage. The confidence level measures the proportion of samples that produce a confidence interval containing the population parameter. A good confidence interval is one that is as narrow as possible and has a confidence level near 100%. (However, unless we sample every civic amenity in NWRWMG, we can never construct a 100% confidence interval). For example if the level of confidence is 95%, we are 95% certain that the true population mean is within the stated confidence interval. Combining the terms confidence interval and level of confidence, we use the phrase “95% confidence interval”. Applying this term to the previous example, we would be 95% certain that the true population mean would fall within the 4% to 6% range.

The narrower the interval, the more exact the estimated parameter is located, while the larger the confidence level, the more confidence we have that a particular interval encloses the estimated parameter. The confidence level gives a measure of the confidence one can place in the confidence limits constructed from the data contained in a sample. In that sense the width of an interval and its associated confidence level measure the accuracy of the confidence interval. Larger samples provide more information to use in forming the interval estimate. Therefore, for a given confidence level, the larger the sample the narrower will be the resulting confidence interval.

Finally, the level of confidence and the confidence interval have an inverse relationship. For example, for an 80% level of confidence, the confidence interval will be narrower than if the level of confidence were 95%. The results are expressed on a 95% confidence level as recommended by best practice guidelines for EU waste characterisation studies. Extrapolation was carried out on the obtained sample results in relation to the 27 civic amenity sites in NWRWMG.

A comprehensive statistical analysis was undertaken to produce the survey results including the following:

- Mean
- Median
- Standard deviation

- Variation coefficient
- Confidence coefficient
- Relative confidence interval (%)
- Confidence interval (kg)
- Composition

### 3.0 COMMINGLED WASTE DATA

#### 3.1 SITE VISITS

As detailed previously in Section 2.0 a number of site visits were undertaken during the month of July. An assessment of CA sites with regards to acceptance of commingled waste is summarised below. Site layouts of the seven CA Sites sampled for the waste compositional study are contained in Appendix A.

##### 3.3.1 Ballymoney Borough Council

Crosstagherty CA site was visited on the 14<sup>th</sup> of July.

**Table 3.1 CA Site Information – Crosstagherty CA Site**

<b>Ballymoney Borough Council</b>	
Commingled Waste Recycling Rate throughout the local authority area (2008/09)	45%
No. of Other Sites in Borough	1, Knock Road
Waste Acceptance	The site accepts a wide range of materials for recycling. Segregated waste streams accepted at the facility are listed in Appendix B.
Residual Waste	Residual waste or so called black bin waste is accepted at the site and sent directly to landfill. Two skips are currently provided for this waste stream. This material does not form part of the commingled waste stream.
Commingled Waste	Commingled waste is also accepted at the facility in a number of large general waste skips. This waste is sent to an MRF where a certain proportion of the waste stream is recycled with the remaining commingled waste sent to landfill.
Acceptable for Compositional Study	Following the site visit it was deemed suitable to conduct a compositional analysis on the commingled waste stream being collected.
Sample Collected for Study	Commingled only. The residual waste stream collected is assumed to be similar in compositional to household kerbside collected waste.



**Plate 1**                      **Commingled waste stream skips Crosstagherty**

### **3.3.2 Coleraine Borough Council**

Portstewart CA Site was visited on the 14th of July.

**Table 3.2**                      **CA Site Information – Portstewart CA Site**

<b>Coleraine Borough Council</b>	
Commingled Waste Recycling Rate throughout the local authority area (2008/09)	36%
No. of Other Sites in Borough	5, Garvagh, Loughanhill Industrial Estate, Portrush, Castlerock and Kilrea
Waste Acceptance	The site accepts a wide range of materials for recycling. Segregated waste streams accepted at the facility are listed in Appendix B.
Commingled Waste	Commingled waste is accepted at the facility. Any other residual waste (e.g. black bag waste) coming into the site is directed to the commingled waste stream. This waste is sent to an MRF where a certain proportion of the waste stream is recycled with the remaining commingled waste sent to landfill.
Acceptable for Compositional Study	Following the site visit it was deemed suitable to conduct a compositional analysis on the commingled waste stream being collected.
Sample Collected for Study	Commingled



### 3.3.3 Derry City Council

Strathfoyle CA site was visited on the 15<sup>th</sup> of July.

**Table 3.3 CA Site Information –Strathfoyle CA Site**

Derry City Council	
Commingled Waste Recycling Rate throughout the local authority area (2008/09)	39%
No. of Other Sites in Borough	6, Claudy, Pennyburn, Brandywell, Eglinton, Glendermott Road, and Park
Waste Acceptance	The site accepts a wide range of materials for recycling. Segregated waste streams accepted at the facility are listed in Appendix B.
Residual Waste	Residual waste which is primarily comprised of food waste is accepted at the facility for disposal to landfill, it does not form part of the commingled waste stream.
Commingled Waste	Following consultation with Derry City Council it was clarified that both Strathfoyle and Park Civic Amenity Sites do not accept commingled waste. Only Glendermott Road, Brandywell and Pennyburn CA Sites accept commingled waste.
Acceptable for Compositional Study	It was decided that Glendermott Road CA Site would be the most suitable site to conduct a compositional analysis on the commingled waste stream being collected at civic amenity sites operated in the Derry City Council area. The commingled waste stream is collected in a compactor at the facility.
Sample Collected for Study	Commingled only. The residual waste stream collected is assumed to be similar in compositional to household kerbside collected waste.



**Plate 2 Food Waste Skip Strathfoyle CA Site**

### 3.3.4 Limavady Borough Council

Ballyquin CA site was visited on the 15<sup>th</sup> of July.

**Table 3.4 CA Site Information – Ballyquin CA Site**

Limavady Borough Council	
Commingled Waste Recycling Rate throughout the local authority area (2008/09)	47%
No. of Other Sites in Borough	1, Dungiven
Waste Acceptance	The site accepts a wide range of materials for recycling. Segregated waste streams accepted at the facility are listed in Appendix B.
Residual Waste	No residual waste or so called black bin waste is accepted at the Ballyquin Road or Dungiven CA Sites. .
Commingled Waste	Commingled waste is accepted at the Ballyquin CA Site in a number of large general waste skips. This waste is sent to an MRF where a certain proportion of the waste stream is recycled with the remaining commingled waste sent to landfill.
Acceptable for Compositional Study	As the Ballyquin site is more representative of the current and future arrangements it was deemed suitable site to conduct a compositional analysis on the commingled waste stream.
Sample Collected for Study	Commingled only. It is not currently anticipated that any residual waste will be collected separately by April 2012 at the Limavady CA sites.



**Plate 5**                      **Example of Commingled Waste being Deposited**

### **3.3.5    *Magherafelt District Council***

Maghera CA site was visited on the 14<sup>th</sup> of July.

**Table 3.5**                      **CA Site Information – Maghera CA Site**

<b>Magherafelt District Council</b>	
Commingled Waste Recycling Rate throughout the local authority area (2008/09)	34%
No. of Other Sites in Borough	3, Magherafelt, Castledawson, and Draperstown,
Waste Acceptance	The site accepts a wide range of materials for recycling. Segregated waste streams accepted at the facility are listed in Appendix B.
Commingled Waste	Commingled waste is accepted at the facility. Any other residual waste (e.g. black bag waste) coming into the site is directed to the commingled waste stream. This waste is sent to an MRF where a certain proportion of the waste stream is recycled with the remaining commingled waste sent to landfill.
Acceptable for Compositional Study	This site was deemed suitable to conduct a compositional analysis on the commingled waste stream being collected at civic amenity sites for Magherafelt District Council.
Sample Collected for Study	Commingled



**Plate 6**                      **Commingled Waste Stream Skips Maghera**

### 3.3.6 Moyle District Council

Carnealty CA site was visited on the 14<sup>th</sup> of July.

**Table 3.6 CA Site Information – Carnealty CA Site**

Moyle District Council	
Commingled Waste Recycling Rate throughout the local authority area (2008/09)	51%
No. of Other Sites in Borough	None
Waste Acceptance	The site accepts a wide range of materials for recycling. Segregated waste streams accepted at the facility are listed in Appendix B. It should be noted that there are no specific waste skips for wood, cardboard and paper at the facility. This is accepted with commingled waste.
Residual Waste	Residual waste or so called black bag waste is not accepted on the site but if a resident brings black bags to the site they are placed in 1100 litre bins and go directly to landfill.
Commingled Waste	Commingled waste is accepted at the facility in a number of large general waste skips. This waste is sent to an MRF where a certain proportion of the waste stream is recycled with the remaining commingled waste sent to landfill (see comment in waste acceptance).
Acceptable for Compositional Study	Yes
Sample Collected for Study	Commingled



**Plate 7 Commingled Waste Stream Skips at Carnealty CA Site**

### 3.3.7 Strabane District Council – Donemana

Donemana CA site was visited on the 14<sup>th</sup> of July.

**Table 3.7 CA Site Information – Donemana CA Site**

Strabane District Council	
Commingled Waste Recycling Rate throughout the local authority area	0%
No. of Other Sites in Borough	3, Killen, Plumbridge, Newtownstewart
Waste Acceptance	The site accepts a wide range of materials for recycling. Segregated waste streams accepted at the facility are listed in Appendix B.
Residual Waste	Black bin waste and other wastes are accepted at the facility in a bin lorry. This is sent directly to landfill for disposal. This waste stream appears to be similar to other local authorities' commingled waste stream. Strabane District Council does not currently send a commingled waste stream to an MRF.
Acceptable for Compositional Study	Yes
Sample Collected for Study	Residual, which is similar to the other local authorities commingled waste stream.



**Plate 9 Commingled Waste Stream Skips Donemana**



### 3.3.8 Further Site Visits

Following initial site visits it was noted that all local authorities accept either commingled and/or residual waste at Civic Amenity sites. Some authorities are sending all this material to the dirty MRF's, others are sending a proportion of it to the MRF and other amounts direct to landfill, while Strabane District Council sends all the material direct to landfill. Therefore from these initial site visits there appeared to be no consistent methodology throughout the NWRWMG for managing the commingled and residual waste streams. As a result further site visits were undertaken on 27<sup>th</sup> July and a table summarising methodology for accepting either commingled and/or residual waste at Civic Amenity sites is presented in Appendix B. As referenced in Section 2.3 three sites within Strabane District Council area were not visited. The Brandywell site was also omitted from the site visits as it was closed during this element of the Study but has since re-opened.

## 3.2 WASTE DATA FLOW

Table 3.7 summaries the amount of waste either that will make up the commingled waste stream for each local authority in the NWRWMG.

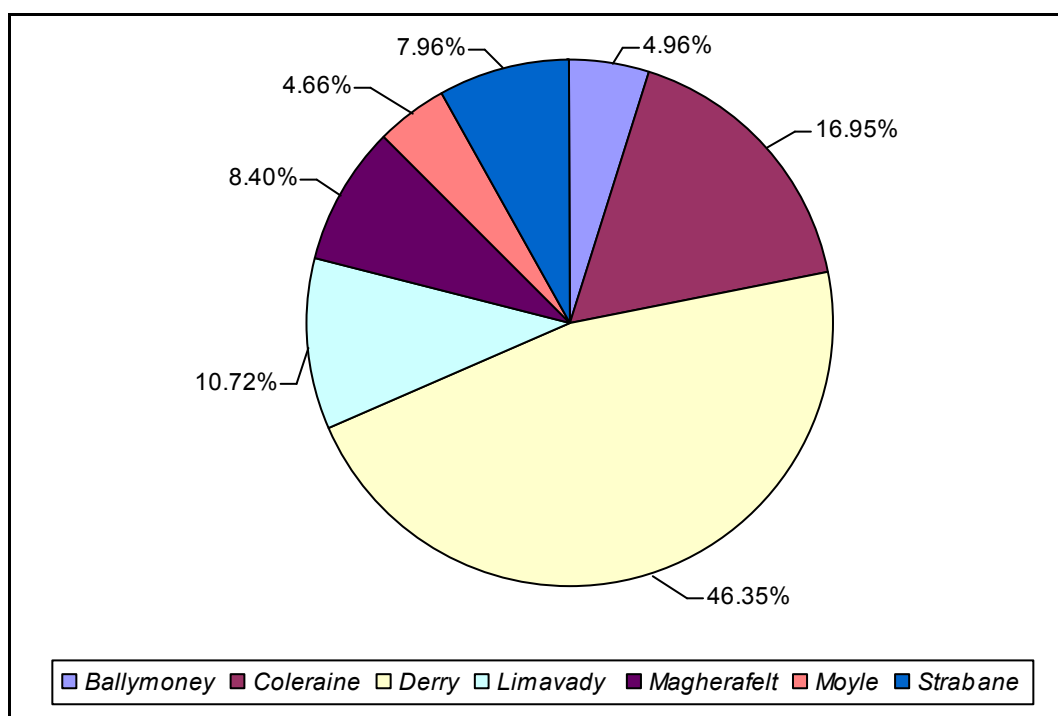
**Table 3.7 Total Commingled Waste throughput by Council Area in 2008/09**

	Ballymoney	Coleraine	Derry	Limavady	Magherafelt	Moyle	Strabane	Totals
CA Site Residual Waste (Sent direct to landfill)	1,461	-	- <sup>2</sup>	-	2,084 <sup>3</sup>	-	3,282	6,827
Commingled Waste (Sent direct from CA Site to dirty MRF)	583	6,992	19,119	4,422	1,381	1,923	-	34,420
<b>Total</b> (Total Commingled forming commingled waste of Residual waste Contract)	<b>2,044</b>	<b>6,992</b>	<b>19,119</b>	<b>4,422</b>	<b>3,465</b>	<b>1,923</b>	<b>3,282</b>	<b>41,247</b>

The distribution of the commingled waste collected at the Civic Amenity Sites in the NWRWMG is illustrated in Figure 3.1.

<sup>2</sup> The waste tonnage is included in the household waste figure i.e. contract waste general

<sup>3</sup> Magherafelt District Council only started to utilise the dirty MRF for commingled waste during the year 2008/09.



**Figure 3.1 Distribution of Commingled Waste throughout the NWRWMG in 2008/09**

As detailed in this section of the report all local authorities in the NWRWMG accept a wide variety of materials for recycling at CA Sites and are achieving relatively high recycling rates from the segregation and recycling of waste on sites. Further recycling and diversion is being achieved by recycling the commingled waste stream and this is summarised in Table 3.8. Currently the NWRWMG is achieving an average recycling of 40% on the commingled waste stream sent to the dirty MRF.

**Table 3.8 Material landfilled from dirty MRF 2008/09**

	Ballymoney	Coleraine	Derry	Limavady	Magherafelt	Moyle	Strabane	Totals
Input from CA Site to dirty MRF	583	6,992 <sup>6</sup>	19,119	4,422	1,381	1,923	-	34,420
Recycled at dirty MRF	264	2,550	7,362	2,062	473	975	0	13,687
Landfilled from dirty MRF	319	4,294	11,757	2,361	907	947	0	20,585

<sup>5</sup> The figure for Strabane District Council is based on the waste tonnage currently sent to landfill.

<sup>6</sup> There is a difference of 148 tonnes in the amount of material sent to the dirty MRF compared to that either recycled or composted for Coleraine Borough Council. Further clarification is needed in relation to this but it could be due to materials such as wood etc being stockpiled on site at the dirty MRF.



## 4.0 COMPOSITIONAL ANALYSIS RESULTS

### 4.1 INTRODUCTION

This section details the results of the Civic Amenity Site commingled waste compositional analysis.

### 4.2 CIVIC AMENITY SITE WASTE

The composition of commingled waste collected at seven Civic Amenity (CA) Sites (one in each council) throughout the NWRWMG has been obtained from the physical hand sorting of a sample of the waste collected during the summer and winter periods. Waste Data Flow (WDF) operational data has been obtained for the period 2008/2009 for the amount of residual commingled waste collected at CA Sites by the NWRWMG and this data has been used to calculate the percentage Biodegradable Municipal Waste fraction of the commingled waste stream, which is detailed in Section 3.5.

### 4.3 CIVIC AMENITY SITE WASTE GENERATION AND COMPOSITION

Table 4.1 below details the composition of the commingled waste stream at CA Sites.

**Table 4.1**                      **Commingled Waste Composition at CA Sites in NWRWMG by Primary Category**

Primary Category	Waste Composition
Paper	12.41%
Card	5.50%
Dense Plastic	10.17%
Plastic Film	5.70%
Textiles	12.17%
Glass	5.11%
Miscellaneous Combustibles	20.53%
Miscellaneous Non-Combustibles	2.32%
Ferrous Metal	1.53%
Non-Ferrous Metal	1.28%
WEEE	0.90%
HHW	0.97%
Organic Non-Catering	4.05%
Organic Catering	13.61%
Fines	3.73%
<b>Total</b>	<b>100.00%</b>

Table 4.2 provides a more comprehensive breakdown of the waste composition.

**Table 4.2**                      **Commingled Waste Composition at CA Sites in NWRWMG by Secondary**

Category				
Primary Categories	Secondary Categories	Mean	Lower Bound	Upper Bound
Paper	Paper	12.41%	6.30%	18.05%
Card	Card	5.50%	6.82%	18.00%
Dense Plastic	Dense Plastic	10.17%	4.03%	6.98%
Plastic Film	Plastic Film	5.70%	5.17%	15.16%
Textiles and Shoes	Textiles and shoes	12.17%	4.32%	7.09%
Glass	Glass Bottles & Jars - Clear	2.22%	1.69%	2.75%
	Glass Bottles & Jars - Brown	1.25%	0.57%	1.93%
	Glass Bottles & Jars - Green	1.15%	0.62%	1.69%
	Glass Bottles and Jars - Blue	0.00%	0.00%	0.02%
	Other Glass	0.49%	0.00%	1.99%
Miscellaneous Combustibles	Disposable Nappies	2.80%	1.65%	3.96%
	Furniture	0.77%	0.00%	2.21%
	Wood	5.38%	0.00%	11.34%
	MDF, board	0.42%	0.00%	1.32%
	Chipboard	1.80%	0.00%	8.45%
	Hardboard	0.00%	0.00%	0.00%
	Plaster Board	0.76%	0.00%	2.66%
	Laminated Flooring	0.13%	0.00%	0.68%
	Carpet and Underlay	4.68%	0.00%	9.67%
	Soft furnishings	1.71%	0.00%	4.82%
	Other Misc. Combustibles	2.09%	1.20%	2.97%
Miscellaneous Non Combustibles	DIY & Other Misc. Non-combustibles	1.81%	0.00%	8.66%
	Other Misc. Non-combustibles	0.51%	0.00%	1.64%
Ferrous Metal	All Ferrous Metal	1.53%	0.41%	2.66%
Non Ferrous Metal	All Non Ferrous Metal	1.28%	0.71%	1.85%
Waste Electrical and Electronic Equipment	Small WEEE	0.85%	0.30%	1.40%
	Large WEEE	0.05%	0.00%	0.39%
	TV and Monitors	0.00%	0.00%	0.00%
Hazardous Household Waste	All HHW	0.97%	0.36%	1.59%
Organic (Non Catering)	Garden Waste	1.84%	0.37%	3.31%
	Soil	1.86%	0.00%	4.74%
	Other Organic	0.35%	0.14%	0.56%
Organic (Catering)	Organic Catering	13.61%	7.19%	20.03%
Fines	Fines (Less than 10 mm)	3.73%	2.00%	5.46%

As can be seen from Table 4.2 the highest percentage composition was:

- Organic Catering (13.61%),
- Paper (12.41%),
- Textile and shoes (12.17%),
- Dense Plastic (10.17%),

- Plastic Film (5.70%),
- Card (5.50%),

#### 4.4 SEASONALITY

In order to allow for an element of seasonality and achieve results representative of the year as a whole, data was collected during the months of August and November. Table 4.3 shows the difference in the composition of the commingled waste from the summer sample and winter sample for this Study.

**Table 4.3**                      **Summary of Summer and Winter Compositions of the Commingled Waste**

Primary Categories	Summer Sampling			Winter Sampling		
	Mean	Lower Bound	Upper Bound	Mean	Lower Bound	Upper Bound
Paper	14.34%	4.10%	24.59%	9.11%	5.81%	12.41%
Card	4.82%	3.15%	6.50%	6.09%	3.13%	9.06%
Dense Plastic	14.83%	4.67%	24.99%	7.70%	3.47%	11.93%
Plastic film	4.72%	3.32%	6.13%	6.57%	4.81%	8.32%
Textiles	15.90%	7.41%	24.39%	7.70%	4.00%	11.40%
Glass	3.69%	1.20%	6.19%	6.44%	3.97%	8.92%
Miscellaneous comb	15.64%	4.38%	26.90%	24.27%	7.19%	41.34%
Miscellaneous non-comb	3.05%	0.00%	16.32%	1.85%	0.00%	4.98%
Ferrous metal	1.12%	0.00%	2.71%	1.82%	0.28%	3.36%
Non-ferrous metal	0.94%	0.38%	1.50%	1.34%	0.66%	2.02%
WEEE	0.65%	0.00%	1.43%	0.96%	0.00%	2.27%
HHW	0.15%	0.00%	0.69%	1.58%	0.42%	2.75%
Organic non-catering	3.68%	0.00%	8.06%	3.62%	0.00%	9.80%
Organic catering	15.60%	7.81%	23.38%	14.46%	6.21%	22.72%
Fines (Less than 10 mm)	0.86%	0.00%	3.95%	6.49%	4.72%	8.26%

#### 4.5 BIODEGRADABLE MUNICIPAL WASTE

This section provides an analysis of the biodegradable fraction of waste by using the waste compositions from the Study.

The biodegradable fraction of the waste collected is of particular importance when considered in the context of the Landfill Directive targets for the reduction in the biodegradable waste to landfill implemented through the Northern Ireland Landfill Allowance Scheme (NILAS). NILAS makes detailed provisions for the allocation and monitoring of landfill allowances allocated to District Councils. The schedule to the NILAS Regulations details the amount of BMW in certain types of waste and these have been applied for the purposes of this study. The

Regulations defines components consisting of biogenic carbon to be a 100% biodegradable component, fraction with no carbon or solely fossil carbon to be 0% and those with a mixture to be 50%. For example, the Schedule defines paper, card, putrescible waste and vegetable oil as being 100% biodegradable. Footwear, furniture and textiles are regarded as being 50% biodegradable in the regulations. Table 4.4 details the amount of BMW content expressed as a percentage by weight.

**Table 4.4 Percentage BMW Content of Various Waste Categories**

Type of Waste	Amount of BMW (% by weight)
Paper, Card, Putrescible <sup>7</sup> Waste and Vegetable Oil	100%
Footwear, Furniture and Textiles	50%
Batteries, Electrical and electronic equipment, End-of-life vehicles, Fluorescent tubes, Glass, Inert construction and demolition waste, Metal, Mineral oil, Plastic and Soil	0%

Table 4.5 sets out the calculation of the biodegradable fraction of commingled waste in NWRWMG CA sites.

<sup>7</sup> Putrescible waste means any animal or vegetable waste (including wood which is capable of undergoing anaerobic or aerobic decomposition, but do not include any of these other types of wastes: Batteries, Electrical and Electronic Equipment, End-of-Life Vehicles, Florescent Tubes, Glass, Inert Construction and Demolition Waste, Metal, Mineral Oil, Plastic and Soil.

**Table 4.5 Percentage Biodegradability of Residual Commingled Waste Collected from CA Sites**

Waste Categories	% by weight	% Biodegradability	% Biodegradability Content	WDF 08/09	Tonnage Biodegradable
Paper	12.41%	100.00%	12.41%	5118.38	5118.38
Card	5.50%	100.00%	5.50%	2269.28	2269.28
Dense Plastic	10.17%	0.00%	0.00%	0.00	0.00
Plastic Film	5.70%	0.00%	0.00%	0.00	0.00
Textiles and shoes	12.17%	50.00%	6.09%	2510.80	1255.40
Glass Bottles & Jars - Clear	2.22%	0.00%	0.00%	0.00	0.00
Glass Bottles & Jars - Brown	1.25%	0.00%	0.00%	0.00	0.00
Glass Bottles & Jars - Green	1.15%	0.00%	0.00%	0.00	0.00
Glass Bottles and Jars - Blue	0.00%	0.00%	0.00%	0.00	0.00
Other Glass	0.49%	50.00%	0.00%	0.00	0.00
Disposable Nappies	2.80%	50.00% <sup>8</sup>	1.40%	578.28	289.14
Furniture	0.77%	100.00%	0.38%	157.92	157.92
Wood	5.38%	0.00%	5.38%	2219.69	0.00
MDF, board	0.42%	0.00%	0.00%	0.00	0.00
Chipboard	1.80%	0.00%	0.00%	0.00	0.00
Hardboard	0.00%	0.00%	0.00%	0.00	0.00
Plaster Board	0.76%	0.00%	0.00%	0.00	0.00
Laminated Flooring	0.13%	0.00%	0.00%	0.00	0.00
Carpet and Underlay	4.68%	0.00%	0.00%	0.00	0.00
Soft furnishings	1.71%	0.00%	0.00%	0.00	0.00
Other Misc. Combustibles	2.09%	0.00%	0.00%	0.00	0.00
DIY & Other Misc. Non-combustibles	1.81%	0.00%	0.00%	0.00	0.00
Other Misc. Non-combustibles	0.51%	0.00%	0.00%	0.00	0.00
All Ferrous Metal	1.53%	0.00%	0.00%	0.00	0.00
All Non Ferrous Metal	1.28%	0.00%	0.00%	0.00	0.00
Small WEEE	0.85%	0.00%	0.00%	0.00	0.00
Large WEEE	0.05%	0.00%	0.00%	0.00	0.00
TV and Monitors	0.00%	100.00%	0.00%	0.00	0.00
All HHW	0.97%	0.00%	0.00%	0.00	0.00
Garden Waste	1.84%	100.00%	1.84%	759.58	759.58
Soil	1.86%	100.00%	0.00%	0.00	0.00
Other Organic	0.35%	50.00%	0.35%	145.31	72.65
Organic Catering	13.61%	0.00%	13.61%	5613.64	0.00
Fines (Less than 10 mm)	3.73%	50.00% <sup>9</sup>	1.86%	768.57	0.00
	<b>100.00%</b>			<b>20,141.42</b>	<b>9,922.34</b>

Therefore, based on the compositional analysis, the BMW fraction of commingled waste is derived at 49.26%.

<sup>8</sup> Furthermore the Regulations do not state the percentage biodegradability of Disposable Nappies, due to the make up of these, 50% biodegradability has been agreed previously with Northern Ireland Environment Agency.

<sup>9</sup> The Regulations does not specifically state the percentage biodegradability of Fines. However the fines smaller than 10mm encountered in physical sorting of the waste were generally derived from a mixture of organic sources, miscellaneous combustibles and miscellaneous non-combustibles and therefore have been classified as having 50% biodegradability.

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

### 5.1 OVERVIEW

This study has reviewed the waste stream accepted at various CA Sites throughout the NWRWMG. Furthermore the waste compositional analysis has determined the composition of Municipal Solid Waste (MSW) in NWRWMG and reviewed the percentage of Biodegradable Municipal Waste (BMW) of the MSW for NWRWMG.

### 5.2 MANAGEMENT OF COMMINGLED WASTE

Section 3.0 provided information on a number of site visits undertaken in relation to the acceptance of commingled and the management of commingled waste throughout the NWRWMG. It is clear that management varies between CA Site and local authority.

### 5.3 COMPOSITION OF MUNICIPAL WASTE IN NORTHERN IRELAND

Table 5.1 below details the composition of the commingled waste in NRWMG.

**Table 5.1 Composition of the Commingled Waste in NRWMG**

Primary Category	Waste Composition
Paper	12.69%
Card	5.54%
Dense Plastic	10.07%
Plastic Film	5.71%
Textiles	11.87%
Glass	5.09%
Miscellaneous Combustibles	20.82%
Miscellaneous Non-Combustibles	2.26%
Ferrous Metal	1.58%
Non-Ferrous Metal	1.27%
WEEE	0.90%
HHW	0.95%
Organic Non-Catering	3.97%
Organic Catering	13.62%
Fines	3.66%
<b>Total</b>	<b>100.00%</b>

### 5.4 PERCENTAGE OF BIODEGRADABLE MUNICIPAL WASTE IN NORTHERN IRELAND

The BMW fraction of commingled in NWRWMG derived from the Study is **49.26%**.

## 5.5 WASTE COMPOSITION

The study involved detailed waste compositional analysis and conclusions in relation to the various waste stream compositions are detailed in Table 4.2 below:

**Table 5.2 Waste Composition Conclusions**

Waste Composition – Conclusions	
<u>Civic Amenity Sites</u>	
<ul style="list-style-type: none"> <li>Food Waste is the most predominant material (13.6%) collected in the commingled waste, followed by Paper (12.69%), textiles are shoes (11.87%), Dense Plastic (10.1%).</li> </ul>	

## 5.6 NEXT STEPS AND RECOMMENDATIONS

### 5.6.1 Data Reporting Specifically in Relation to CA Sites

Currently District Councils in Northern Ireland are required to report data on municipal waste arisings on a quarterly basis as per NILAS Regulation. The data for each quarter must be submitted to the NIEA (the Monitoring Authority) within two months after the relevant quarter end.

The use of WDF throughout this project provided valuable information, however currently District Councils do not report on each CA Site individually and this proved to be a disadvantage when reviewing the CA Site waste data, particularly with a view to the selection of sites for sampling. Some District Councils may keep detailed records on each individual CA Site and on materials recycled or disposed whereas others may not. It is suggested that more comprehensive data collection is carried out on all CA Sites and all waste streams handled through CA Sites and a standardised reporting method for this developed.

### 5.6.2 Management of Commingled Waste at CA Sites

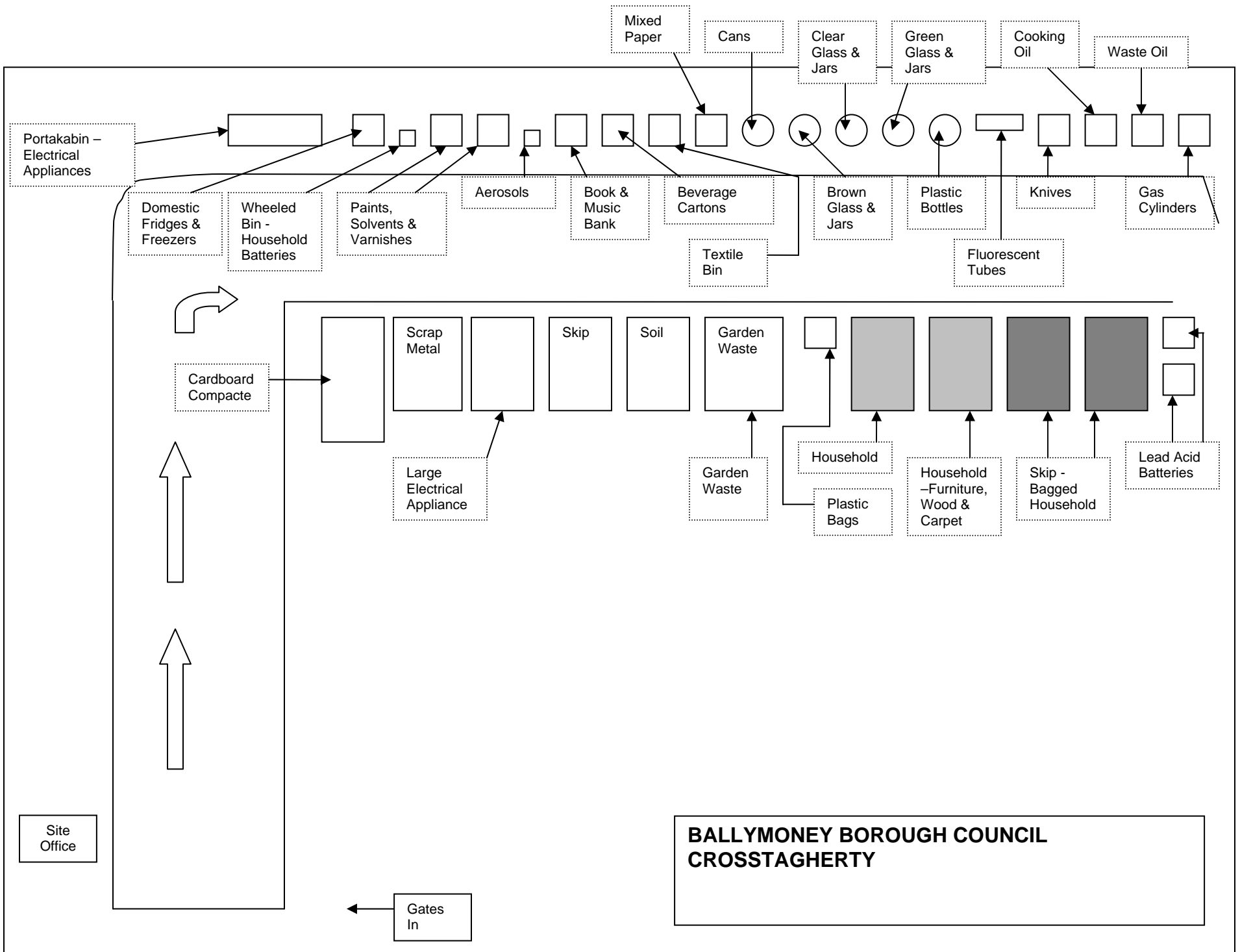
A coordinated approach to the management of waste streams at CA Sites should be adopted by all local authorities in the NWRWMG.

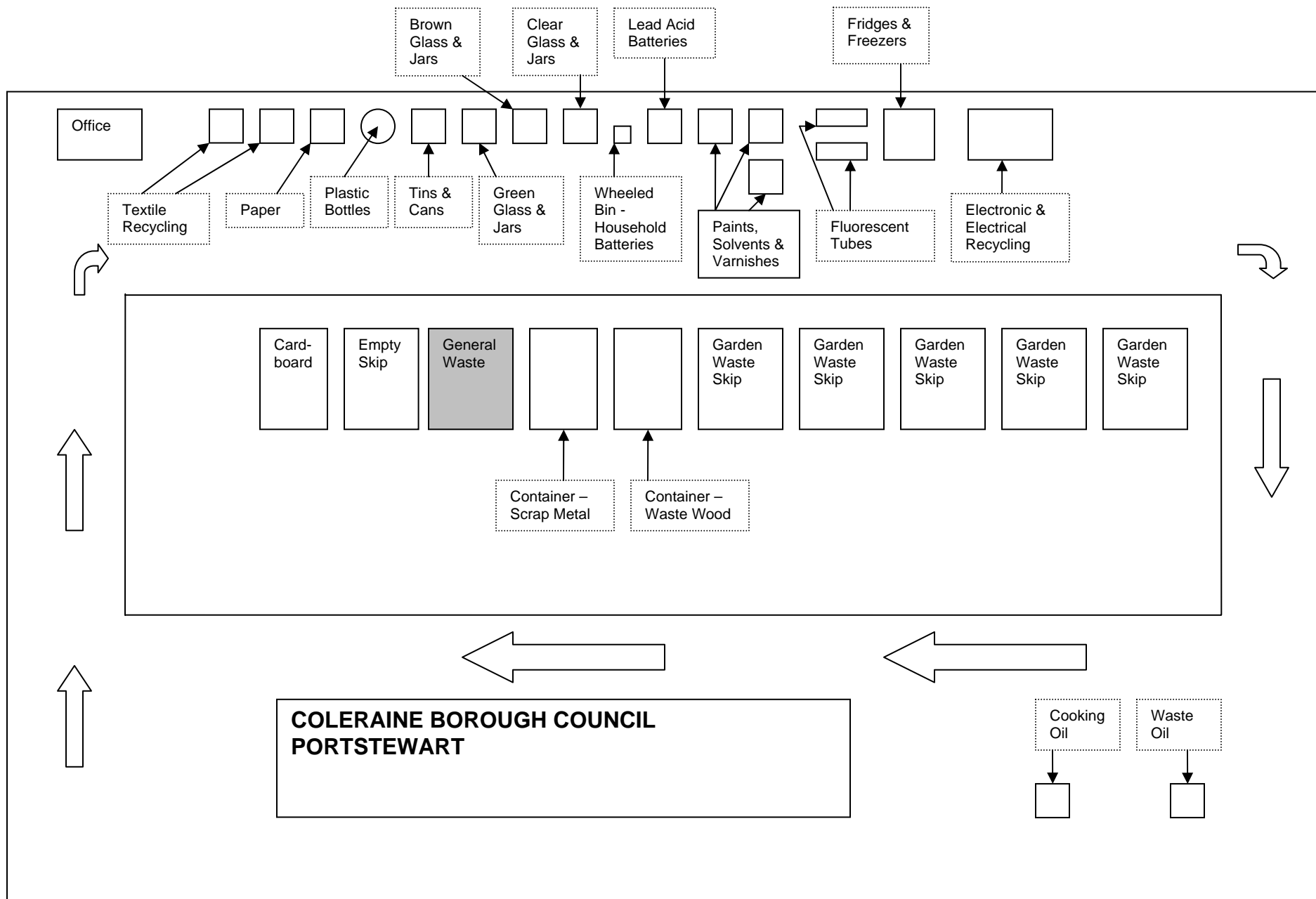
## **APPENDIX A**

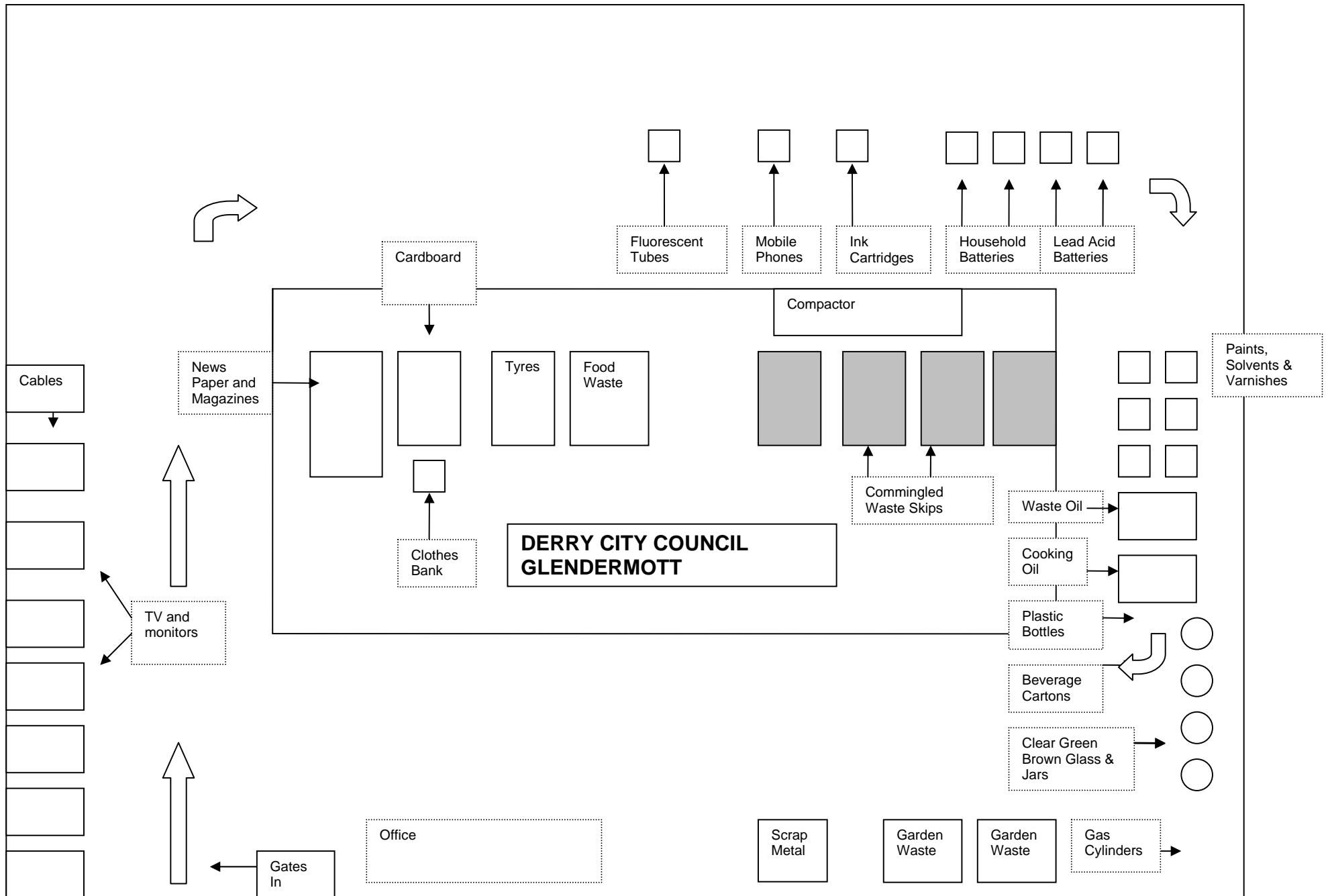
### **CA SITE LAYOUTS**

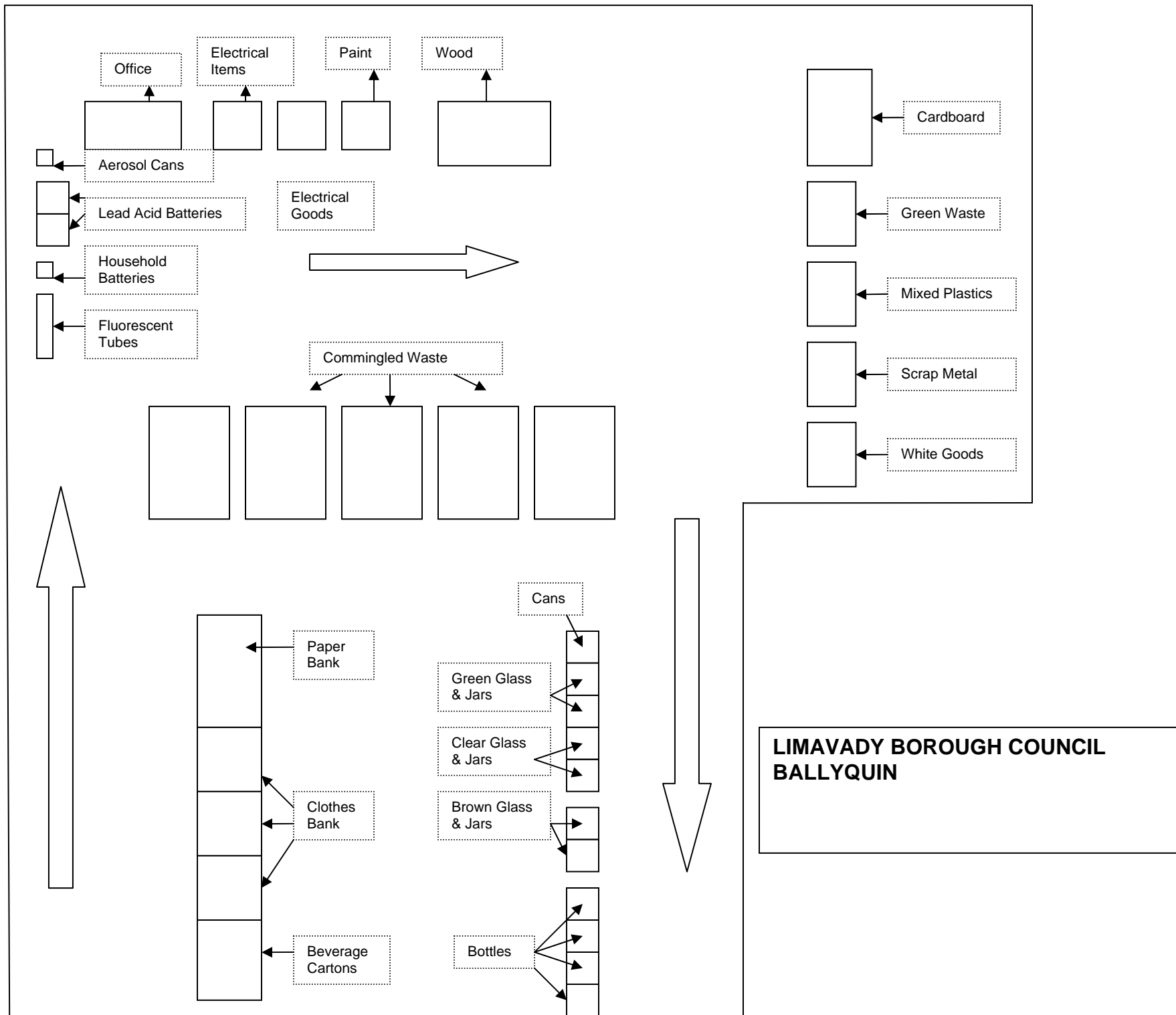


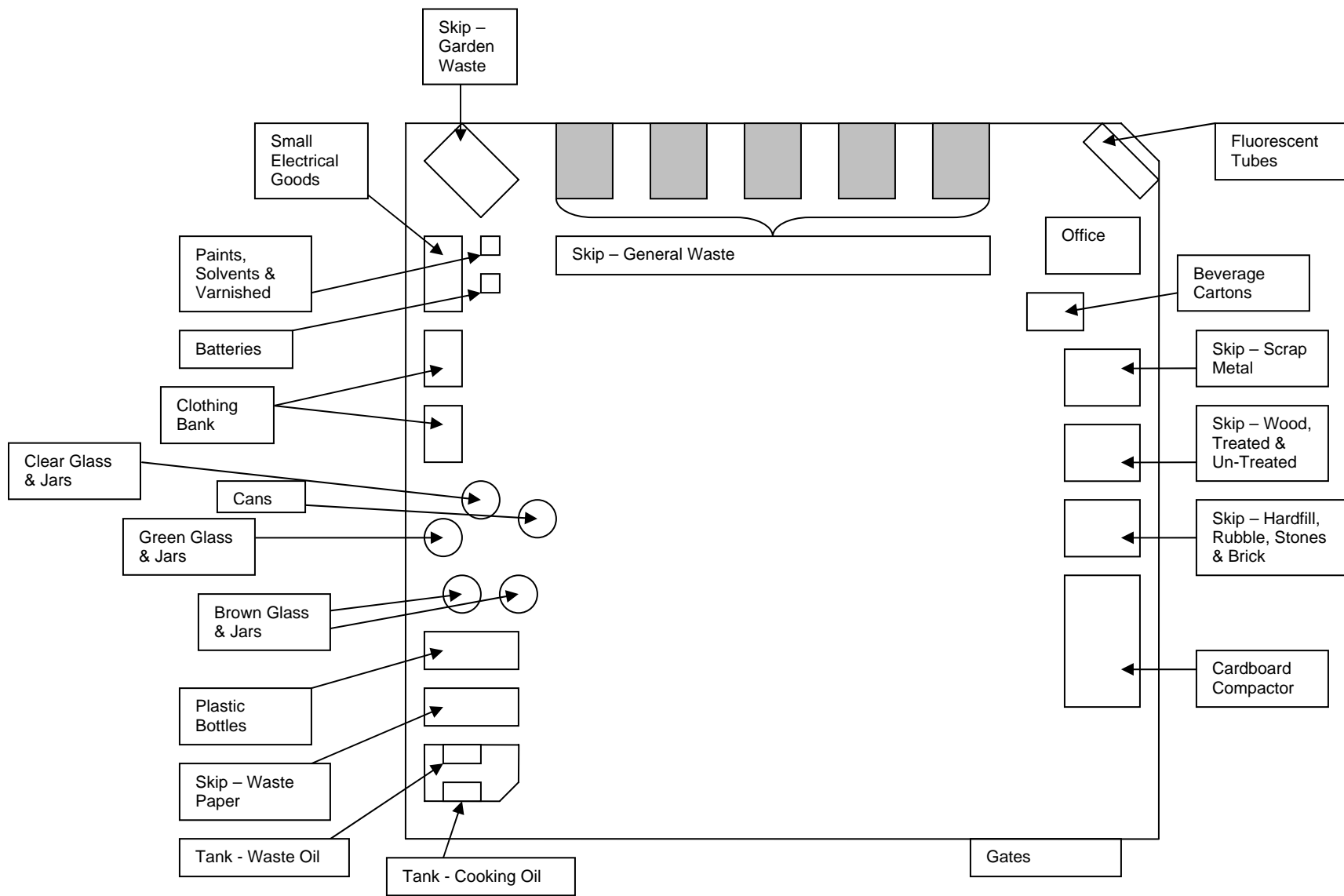




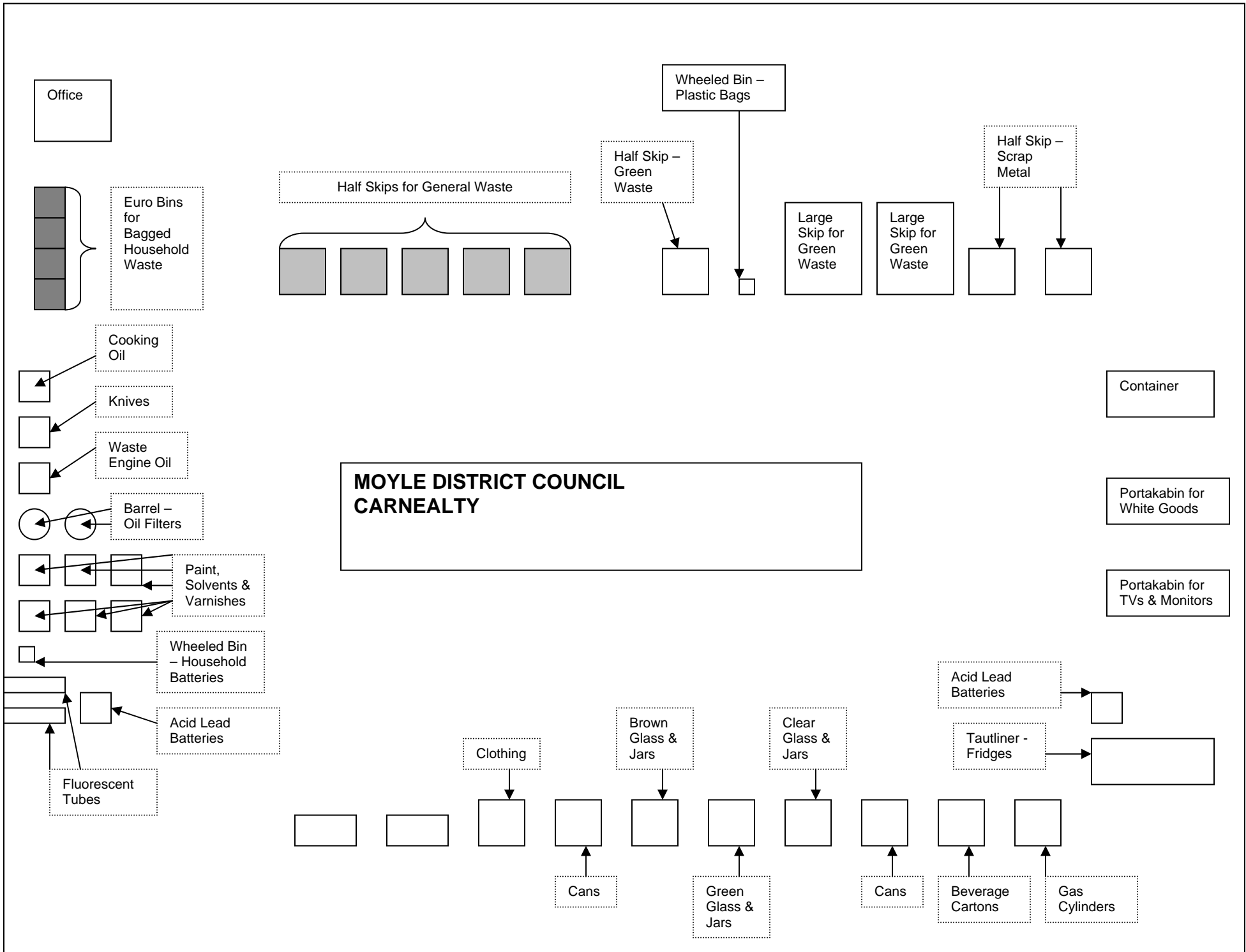


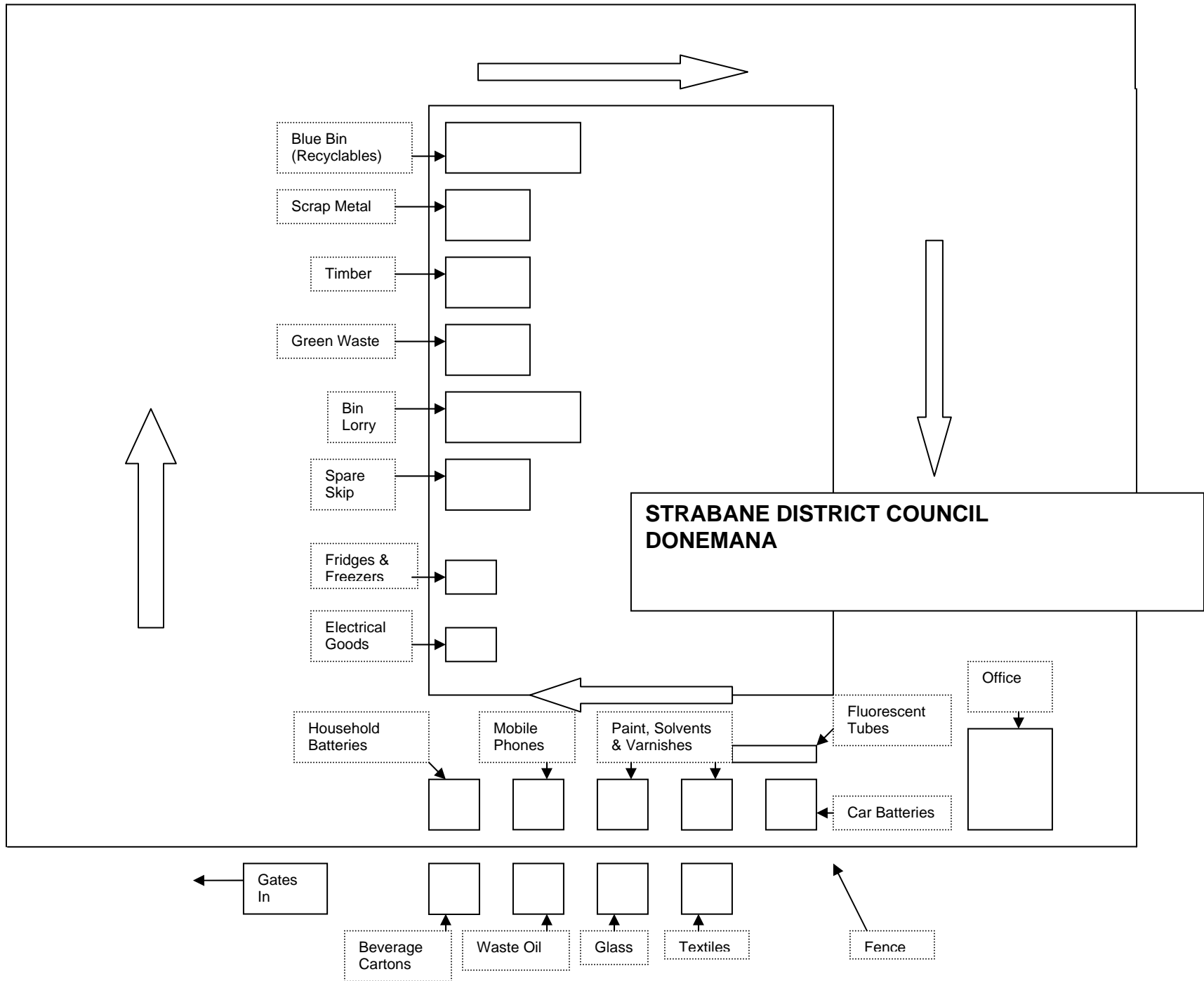






**MAGHERAFELT DISTRICT COUNCIL  
MAGHERA**







## **APPENDIX B**

### **WASTE ACCEPTED ON CA SITES**

	Scrap Metal	Green Waste	Wood, Untreated	Mixed Plastic Skip	Rubble and/or Soil	Cardboard	Paper	Metal Cans	Glass Bottles	Flat Glass	Textiles and Shoes	Engine Oil	Car Batteries	Household Batteries	Tyres	Fridges & Freezers	Fluorescent Tubes	Electrical Goods	Paint & Solvent	Aerosol Cans	Books	Beverage Cartoons	Gas Cylinders	Cooking Oil	Knives	Plastic Bottles	Mobile Phones	Eye Glasses	Ink Cartridges	Oil Filters	Oily Rags	Waste Oil Cans	Plastic Wrap	Plastic Bages	Food Waste			
BALLYMONEY																																						
Knock Road	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	N	N	N	N	N	Y	N		
Crosstagherty	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N		
COLERAINE																																						
Portrush	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	N	N	Y	N	Y	N	N	N	N	N	N	N	N	N	N		
Castlerock	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	N		
Loughanhill	Y	Y	Y, but sent directly to landfill	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	No, (only small electrical goods)	Y	Y	Y	N	Y	Y	N	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N		
Garvagh	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	N	Y	N	Y	N	N	N	N	N	N	N	N	N	N		
Portstewart	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	N	N	Y	N	Y	N	N	N	N	N	N	N	N	N	N		
Loughanhill	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	Y	N	Y	N	Y	N	N	N	N	N	N	N	N	N	N		
Kilrea	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	Y	N	Y	N	Y	N	N	N	N	N	N	N	N	N	N		
DERRY																																						
Strathfoyle	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	N	N	N	Collected separately & sent directly to landfill.		
Pennyburn	Y	Y	Y	N	Y (accept mixed concrete)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Collected separately & sent directly to landfill.		
Glendermott	Y	Y	No separate wood skip - if large volumes of wood came into site it would be diverted to Strathfoyle CAS	N	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	No fridge or freezers accepted due to size of site	Y	Y	Y	N	N	Y	Y	Y	N	Y	Y	Y	Y	Y	N	N	Y	N	N	Collected separately & sent directly to landfill.		
Park	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	Y	Y	Y	N	N	Y	N	N	Collected separately & sent directly to landfill.			
Claudy	Y	Y	N	N	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	Y	N	Y	N	Y	Y	Y	Y	N	N	Y	N	Y	Collected separately & sent directly to landfill.			
LIMAVADY																																						
Ballyquin	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y	N	N	N	N	N	N	N	N	N	N		
Dungiven	N	N	N	N	N	N	N	Y	Y	N	Y	N	N	N	N	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
MAFGERAFELT																																						
Maghera	Y	Y	Y	N	Y, soil skip & separtare hardfill skip	Y	Y	Y	Y	N	Y	Y	Y	N	N	Y	Y	Y	Y	N	N	Y	N	Y	N	Y	N	N	N	N	Y	N	N	N	N	N		
Magherafelt	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	N	N	Y	N	Y	N	Y	N	N	N	N	Y	N	N	Y	N	N		
Castledawson	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	Y	Y	N	N	Y	Y	Y	Y	N	N	Y	N	N	N	Y	Y	Y	Y	Y	N	N	N	N	N	N		
Draperstown	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	Y	N	N	Y	Y	Y	Y	N	N	Y	N	N	N	Y	N	N	N	N	Y	N	N	N	N	N		
MOYLE																																						
Carnealty	Y	Y	Commingled	N	N	Commingled	Commingled	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	Y	N	N	Y	N	N	N	N	N	Y	N	N	N	N	N		
STRABANE																																						
Donemana	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N	Y	N	N	N	N	Y	N	N	N	N	N	N	N	N	N		
Carricklee	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	N	Y	Y	N	Y	N	Y	Y	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N		