An Ghníomhaireacht um Chaomhnú Comhshaoil

National Waste Database Report 1998

Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

National Waste Database
Report 1998

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FOREWORD

In 1996, the EPA published its first National Waste Database Report. That report presented detailed information on waste management in Ireland for the year 1995. The report was primarily based on surveys conducted of local authorities, industry, waste contractors and recycling organisations. It presented national waste statistics for the year 1995 along with an inventory of waste disposal and recovery facilities throughout the State. At that time, it was stressed that the Report was the start of a process which, it was hoped, would lead to the development of reliable statistics over the following decade. In this regard, it is important to note that the quality of information on waste is continuing to improve, with a considerably greater number of waste facilities, for instance, equipped with weighbridges than was the case in 1995, and waste producers, particularly those controlled through the licensing systems operated by the Agency, becoming more familiar with waste terminology and waste reporting in general.

The original establishment of the National Waste Database was undertaken under the Environmental Monitoring, R&D Sub-programme of the Operational Programme for Environmental Services, 1994-99 and was part financed by the European Union through the European Regional Development Fund. In 1995, all surveys conducted were paper-based with information collected on paper questionnaires transcribed into a National Waste Database. For the more recent surveys, considerable modifications were made to the Database to account for changes in legislation since 1995 and each local authority was issued with its own digital National Waste Database module which contained the information reported by the local authority for 1995 and digital questionnaires for completion of the 1998 return. Digital questionnaires were also made available to industries, waste contractors and recycling organisations although the bulk of responses from those surveyed, other than local authorities, were in paper form. In the long term, the EPA wishes to move to a fully digital-based reporting system for waste information in Ireland to facilitate ease of reporting by local authorities, waste producers and waste handlers, and to streamline waste information reporting by local and national authorities. To this effect, the support obtained through the Operational Programme for Environmental Services has proved invaluable by providing the foundation for the establishment of a comprehensive waste information reporting system in Ireland.

ACKNOWLEDGEMENTS

Detailed questionnaires were issued to large and medium sized industries, recycling organisations and waste contractors and brokers within the Republic. The assistance of those who returned completed questionnaires is gratefully acknowledged.

The support of Irish Business Employers Confederation, the Small Firms Association, the Irish Motor Vehicle Recyclers Association, the Industrial Waste Management Association and the Waste Management Association of Ireland is appreciated.

The following organisations /companies gave particular assistance to the study:

Department of the Environment and Local Government; REPAK; Enterprise Ireland; the Central Statistics Office; MC O'Sullivan & Co., Consulting Engineers; Kerbside, Dublin; Returnbatt; Recycling Can-Paign Ireland Ltd.; Animal and Plant Health Association and Rehab Recycling Partnership.

The EPA is most grateful to all the local authorities that provided invaluable information on both waste arisings and waste infrastructure in their functional areas. The Agency appreciates not only the time and effort expended by the local authorities in the preparation of these returns but also in replying to subsequent data validation queries. The EPA is grateful to South Dublin County Council and Meath County Council for photographs provided.

LIST OF ABBREVIATIONS

ADEME	Agence de l'Environment et de la Maitrise de l'Energie
APHA	Animal and Plant Health Association
CSO	Central Statistics Office
DAF	Department of Agriculture and Food
DoELG	Department of the Environment and Local Government
EC	European Community
EEC	European Economic Community
EPA	Environmental Protection Agency
EU	European Union
EWC	European Waste Catalogue
FA	Functional Area
HWL	Hazardous Waste List
IBEC	Irish Business and Employers' Confederation
IIRS	Institute for Industrial Research and Standards
IPC	Integrated Pollution Control
IQR	Interquartile Range
IT	Information Technology
IWMA	Industrial Waste Management Association
LA	Local Authority
MCCK	Waste Strategy Study Group made up of M. C. O'Sullivans & Co, COWI, City of Copenhagen and KPMG
MFSU	Manufacture, Formulation, Supply and Use
NACE	General Industrial Classification of Economic Activities in the European Community
NWD	National Waste Database
PCB	Polychlorinated Biphenyl
PCT	Polychlorinated Terphenyl
PE	Polyethylene
PET	Polyethylene Tetraphthalate
REMECON	European Measurement Group for Characterisation of Household Waste
SI	Statutory Instrument
TDS	Tonnes Dry Solids
WEEE	Waste from Electrical and Electronic Equipment
WMAI	Waste Management Association of Ireland

1. INTRODUCTION

Considerably more information is available on waste management in Ireland now than was available in 1995, the previous year for which national statistics were published. National level information is now available for 1995 and 1998, the Proposed National Hazardous Waste Management Plan has been published and most local authorities have either published, adopted or are in the process of adopting Waste Management Plans. The waste information deficit, to a large extent has been addressed and the challenge now is to maintain and improve the current system of data collection and management so that we have comprehensive and continuous information on waste flows in our society. This will facilitate better management of waste, both at local and national level and realistic planning for waste prevention and minimisation.

The EPA is committed to publishing national reports on waste every three years with the main mechanism for data gathering being a repeat of the surveys conducted in 1995 with whatever revisions are necessary. To this effect, local authorities, industry, waste contractors and recycling organisations were surveyed in late 1998 and early 1999 and asked to submit details of waste activities for the calendar year 1998. This report presents the results of these surveys and, where possible, an analysis of trends over the past three years.

1.1 NATIONAL FRAMEWORK FOR WASTE MANAGEMENT

1.1.1 WASTE POLICY

Recent Government policy in relation to waste management stems primarily from the *National Sustainable Development Strategy*, published in 1997 (DoELG, 1997) and the policy statement by the Minister for the Environment & Local Government on waste management in Ireland called *Waste Management - Changing Our Ways*, published in September, 1998 (DoELG, 1998). *Changing Our Ways* reaffirms that the overall policy of Government in relation to waste management is firmly grounded in the waste hierarchy with prevention and minimisation as the most favoured options and disposal as the least favoured option, as illustrated in Figure 1.1. The policy statement also recognises the distance to be travelled between the aspirations inherent in the waste hierarchy and the present day reality of increasing quantities of waste and continued reliance on landfill.

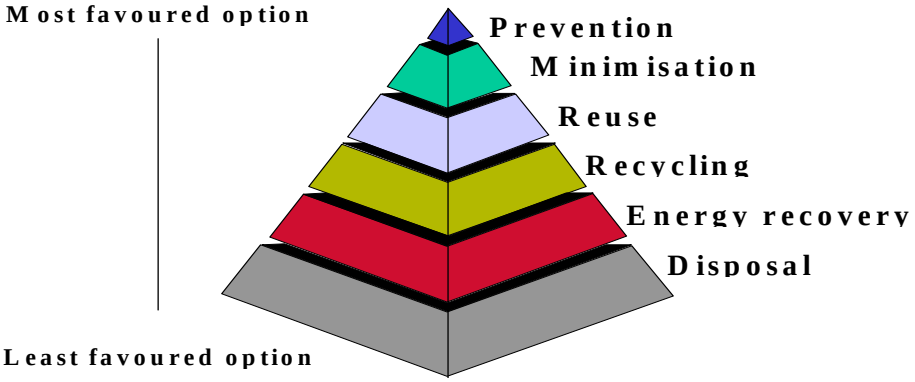


Figure 1.1: Waste Hierarchy

Recognising the central role that local authorities play in waste management, the policy statement is addressed chiefly to local authorities in relation to wastes traditionally collected or accepted by them from households, commercial and industrial sources. The Policy Statement emphasises the key role to be played by local and regional authorities in waste management planning. Other key considerations are the implementation of the polluter pays principle and recognition of the importance of economies of scale when planning waste infrastructure.

Specific targets are set out in the Statement, which provide a roadmap for the years ahead (see Box 1.1).

Box 1.1: Targets Set in *Changing Our Ways* (DoELG, 1998)

Waste Management - Changing Our Ways

Targets

- Diversion of 50% of overall household waste away from landfill;
- A minimum of 65% reduction in biodegradable waste going to landfill;
- The development of waste recovery facilities employing environmentally beneficial technologies;
- Recycling of 35% of municipal waste;
- Recycling of at least 50% of construction and demolition waste within a five year period, with a progressive increase to at least 85% over fifteen years;
- Reduction in the number of landfills; and
- An 80% reduction in methane emissions from landfill.

1.1.2 LEGISLATION

Ireland's waste legislation has undergone radical reform in the past five years, with the enactment of the Waste Management Act in 1996. A principal objective of the Act is to provide a legal framework that will ensure that the holding, transportation, recovery and disposal of waste do not cause environmental pollution. To achieve this objective requires that each step in the waste chain, from the point at which the waste is produced to the point at which it is either recovered or disposed of, be regulated and controlled (see Figure 1.2). Producer responsibility is also at the heart of the legislation and the Act provides the Minister for the Environment and Local Government with significant powers in relation to the placing of responsibilities on waste producers. The Regulatory system provided for in the Act is being introduced through a series of Regulations, which are listed in Box 1.2, together with key European enactments.

Figure 1.2: Measures for Preventing, Minimising and Controlling Waste

Box 1.2: Relevant European and Domestic Waste Legislation

EUROPEAN LEGISLATION

- 1975 Council Directive on the Disposal of Waste Oils (75/439/EEC);
- 1975 Council Directive on Waste (75/442/EEC);
- 1976 Council Directive on the Disposal of Polychlorinated Biphenyls and Polychlorinated Terphenyls (PCB/PCT) (76/403/EC);
- 1985 Council Directive on Containers of Liquids for Human Consumption (85/339/EEC);
- 1986 Council Directive on the Protection of the Environment when Sewage Sludge is Used in Agriculture (86/278/EEC);
- 1987 Council Directive on the Prevention and Reduction of Environmental Pollution by Asbestos (87/217/EEC);
- 1991 Council Directive on Waste (91/156/EEC);
- 1991 Council Directive on Hazardous Waste (91/689/EEC);
- 1993 Commission Directive on Batteries and Accumulators Containing Certain Dangerous Substances (93/86/EEC);
- 1993 Council Regulation (EC) No, 259/93 of 1 February 1993 on the shipment of wastes within, into and out of the European Community;
- 1993 Commission Decision on a List of Wastes (94/3/EC);
- 1994 Commission Decision on Questionnaires on Reports on Directives in the Waste Sector(94/741/EC);
- 1994 Commission Decision on the Standard Consignment Note Referred to in Council Regulation (EEC) No 259/93 on Shipment of Waste (94/774/EC);
- 1994 European Parliament and Council Directive on Packaging and Packaging Waste (94/62/EC);
- 1994 Council Directive on the Incineration of Hazardous Waste (94/67/EC);
- 1994 Council Decision on a List of Hazardous Waste (94/904/EC);
- 1996 Council Directive on the Disposal of Polychlorinated Biphenyls and Polychlorinated Terphenyls (PCB/PCT) (96/59/EC);
- 1996 Council Directive Concerning Integrated Pollution Prevention and Control (96/61/EC);
- 1996 Commission Decision Establishing a Format for Information under Article 8(3), Council Directive 91/689/EEC on Hazardous Waste (96/302/EC);
- 1997 Commission Decision Establishing the Identification System for Packaging Materials (97/129/EC);
- 1997 Commission Decision Establishing the Formats Relating to the Database System pursuant to European Parliament and Council Directive 94/62/EC on Packaging and Packaging Waste (97/138/EC);
- 1997 Commission Decision on Harmonised Measurement Methods in Determining the Mass Concentration of Dioxins and Furans in Atmosphere Emissions (97/283/EC);
- 1998 Commission Decision on a Questionnaire for Council Directive 94/67/EC on the Incineration of Hazardous Waste (98/184/EC)
- 1999 Council Directive on the Landfill of Waste (99/31/EC);
- 1999 Commission Decision on Derogations for Plastic Crates and Pallets from Directive 94/62/EC on Packaging and Packaging Waste (1999/177/EC).

DOMESTIC LEGISLATION

Acts

- Air Pollution Act, 1987;
- Environmental Protection Agency Act, 1992;
- Dumping at Sea Act, 1996;
- Waste Management Act, 1996;
- Litter Act, 1997.

Regulations

- Air Pollution Act,1987 (Municipal Waste Incineration) Regulations, 1992 SI 347 of 1992;
- The Waste Management (Licensing) Regulations,1997 SI No 133 of 1997;
- The Waste Management (Planning) Regulations,1997 SI No 137 of 1997;
- The Waste Management (Register) Regulations, 1997 SI No 183 of 1997;
- The Waste Management (Packaging) Regulations, 1997 SI No 242 of 1997;
- The Waste Management (Farm Plastics) Regulations, 1997 SI No 315 of 1997;
- The Waste Management (Amendment of Waste Management Act, 1996) Regulations, 1998 SI No 146 of 1998;
- The Waste Management (Movement of Hazardous Waste) Regulations, 1998 SI No 147 of 1998;
- The Waste Management (Use of Sewage Sludge in Agriculture) Regulations, 1998 SI No 148 of 1998;
- The Waste Management (Transfrontier Shipment of Waste) Regulations, 1998 SI No 149 of 1998;
- The Waste Management (Licensing) (Amendment) Regulations, 1998 SI No 162 of 1998;
- The Waste Management (Hazardous Waste) Regulations, 1998 SI No 163 of 1998;
- The Waste Management (Miscellaneous Provisions) Regulations, 1998 SI No 164 of 1998;

Box 1.2 (continued)
DOMESTIC LEGISLATION (continued)

- The Waste Management (Permit) Regulations, 1998 SI No 165 of 1998;
- The European Communities (Amendment of Waste Management Act, 1996) Regulations, 1998 SI No 166 of 1998;
- The European Communities (Licensing of Incinerators of Hazardous Waste) Regulations, 1998 SI No 64 of 1998;
- The Waste Management (Water Pollution) (Nutrient Management Planning Consultation) Regulations, 1998 SI No 257 of 1998;
- The Waste Management (Packaging) (Amendment) Regulations, 1998 SI No 382 of 1998.

1.1.3 CONTROLLING WASTE

WASTE PLANNING

Waste management planning was first introduced on a statutory basis in Ireland in 1979 for non-hazardous waste and in 1982 for hazardous (toxic and dangerous) waste. These plans, prepared by local authorities, were aimed mainly at disposal of waste and ensuring that adequate arrangements were made for safe disposal. No public consultation was required and plans did not have to address issues such as waste reduction or waste recovery.

The Waste Management Act, 1996 brought about radical changes to waste planning in Ireland. The thrust of planning is now towards:

- waste prevention;
- waste minimisation;
- waste recovery;
- Regional/local authority waste management planning;
- safe disposal of non-recoverable waste without causing environmental pollution;
- making the polluter pay; and
- Public consultation.

Local authorities are responsible for the preparation and implementation of waste management plans for all waste produced in their area including agricultural waste and sludges. One or more local authorities can combine to prepare a joint waste management plan. In general, local authorities are combining forces and the trend in the past two years has been to have regional waste management strategy studies carried out on behalf of a number of local authorities. A list of these studies is provided in Box 1.3. These studies then form the basis for the Waste Management Plans, which, following public consultation, are adopted by each local authority. The making, review variation or replacement of a Waste Management Plan is a reserved function. At time of going to press, 5 waste management plans have been adopted covering the functional areas of 8 local authorities. Waste management plans will provide the framework for improved waste management. The planning approach, however, will only work if it is dynamic, which means subjecting the targets and objectives set out in a plan to continuous review.

Box 1.3: List of Regional Waste Management Strategies and Feasibility Studies

Strategies	**Completion Date**
Waste Management Strategy for Cork Region	May 1995
Dublin Regional Waste Management Strategy	January 1998
South Eastern Waste Management Strategy	October 1998
Galway Waste Management Strategy Study (Galway City and County)	December 1998
Connaught Waste Management Strategy	April 1999
Midland Waste Management Strategy	April 1999
Limerick Waste Management Strategy Report (Limerick City and County)	May 1999
North East Waste Management Strategy	October 1999

Box 1.3 (continued)

Feasibility Studies	Completion Date
Feasibility Study of Thermal Options for Waste Treatment/ Recovery in the North East Region	January 1999
Feasibility Study of Thermal Options for Waste Treatment/Recovery in the Mid West Region	January 1999
A Feasibility Study for Biological Treatment of Waste in the Dublin Region Report	September 1999
Feasibility Study of Thermal Options for Waste Treatment/ Recovery in the Dublin Region	November 1999

The EPA is responsible for the preparation of a national hazardous waste management plan. The proposed plan was published in September 1999 and the plan will be published following completion of the public consultation period which is currently underway. Local authorities must have regard to the recommendations made by the EPA in the national hazardous waste management plan, so that waste management plans take into account the requirements for managing hazardous waste. Both sets of plans are to be reviewed at a minimum of every five years.

CONTROL OF WASTE PRESENTATION

Under the Waste Management Act, local authorities can control how household and commercial waste is presented for collection by making a bye-law placing obligations either on the producer of the waste or the collector of the waste. This can relate to the type of receptacle to be used, the location of receptacles and the time at which waste is to be made available for collection. Such bye-laws can be considered where a local authority considers it necessary for the purpose of the proper management of the waste or the prevention or control of environmental pollution.

CONTROL OF COLLECTION AND MOVEMENT OF WASTE

A key part of the waste chain is the collection of waste at the point at which it is produced and movement of that waste to its final destination, be it for recovery or disposal. The Waste Management Act provides for comprehensive control of the collection and movement of waste both within the State (internal movement) and into and out of the State (import/export). Local authorities are responsible for regulating all aspects of collection and movement with the one exception of the importation of waste into Ireland, which is regulated by the EPA. Local authorities are also responsible for the collection of household waste in their functional areas.

The Waste Management Act provides for a permitting system for waste collection and requires persons, other than local authorities, engaged in the collection of waste for the purposes of reward, with a view to profit or otherwise in the course of business, to hold a waste collection permit granted by the local authority in whose functional area the waste is collected.

All movements of hazardous waste within the State are regulated by local authorities under the Waste Management (Movement of Hazardous Waste) Regulations. These regulations provide for the tracking of movements of hazardous waste within the State by means of a system of documentation to be completed by the consignor, carrier and consignee (persons who produce the waste, transport the waste and receive the waste) and to be furnished to the appropriate local authorities.

Waste movements into and out of the State are regulated under the Waste Management (Transfrontier Shipment of Waste) Regulations, 1998. Local authorities are responsible for regulating the export of waste from their functional areas while the EPA is responsible for regulating the importation of waste into the State.

CONTROL OF RECOVERY AND DISPOSAL OF WASTE

The final link in the waste chain is what happens to the waste at its final destination. The Waste Management Act provides for the regulation and control of disposal and recovery activities. The Act requires that operators of all significant waste disposal and recovery activities obtain a waste licence from the EPA. A principal objective of the licensing system is to ensure those waste activities such as landfills, transfer stations and recycling depots are operated in a manner which does not cause environmental pollution. The EPA cannot grant a licence unless it is satisfied, among other things, that the activity is not causing environmental pollution, when operated in accordance with the licence issued by the EPA.

Facilities that require a licence include landfill sites, transfer stations, storage facilities, hazardous waste disposal and recovery facilities, large composting facilities and certain types of treatment facilities. The system is being introduced on a phased basis and dates have been set by which time operators of both public and private waste disposal and recovery activities of specified types and sizes have to apply to the EPA for a licence.

A local authority permitting system has also been established for smaller activities such as scrap yards, small composting activities, non-hazardous waste incinerators that process less than one tonne of waste per hour and recovery activities.

1.1.4 PRIORITY ISSUES

The priority waste issues as Ireland moves into the next millennium are to put an adequate infrastructure in place for the proper management and control of waste in Ireland, so as to ensure that waste management is conducted in a responsible and environmentally sensitive manner, and to begin the process of reversing the current trend in increasing quantities of waste, that is, attempting to break the link between economic growth and waste production.

Waste streams that merit particular attention include municipal waste, hazardous waste, packaging waste, construction and demolition waste, waste from electrical and electronic equipment, waste from end of life vehicles and waste tyres. The management of agricultural and similar organic wastes including sewage sludges also represents a significant challenge and merits particular attention in future years

2. METHODOLOGY

2.1 INTRODUCTION

This chapter sets out the various methodologies that were used to collect and collate information on waste arisings and disposal/recovery practices. Generally, the same methodology as that applied in 1995 was used for the 1998 surveys. Where differences exist or changes were made, these are highlighted.

2.2 MUNICIPAL WASTE

2.2.1 DEFINITION

Municipal waste means household waste as well as commercial and other waste, which because of its nature and composition is similar to household waste. It can be considered to consist primarily of household waste, commercial waste and street cleaning waste, as defined below.

> *Household waste is waste produced within the curtilage of a building or self-contained part of a building used for the purposes of living accommodation.* (It comprises a major component of municipal waste.)
>
> *Commercial waste is defined as waste from premises used wholly or mainly for the purposes of a trade or business or for the purposes of sport, recreation, education or entertainment but does not include household, agricultural or industrial waste.*

2.2.2 DETERMINATION OF AMOUNTS ARISING AND DISPOSAL/RECOVERY ROUTES

The principal method of obtaining data on municipal waste was through a digital questionnaire circulated to all local authorities. This questionnaire was designed to collect information available to local authorities on municipal, industrial and other waste, in addition to the location of all public and private waste disposal and recovery facilities. Information was also sought on closed landfills.

All local authorities are now required to conduct waste management planning in their functional areas and the information to be contained in a Waste Management Plan is specified in section 22 of the Waste Management Act, 1996 and the Waste Management (Planning) Regulations, 1997 (S.I. 137 of 1997). The Regulation requires, among other things, that a plan specify the quantities of waste arising in the functional area and waste movements into and out of the functional area for a range of waste types specified in the Regulation. The local authority module of the National Waste Database was therefore modified to harmonise it with the data reporting requirements of S.I. 137 of 1997 and new forms under the heading 'Waste Flows' were added.

These forms are designed to collect summary information on waste arisings and flows within each functional area under three general headings:

- Form A: Summary of waste arisings in functional area;
- Form B: Summary of waste disposal/recovery routes in functional area;
- Form C: Summary of hazardous waste management in functional area.

The waste descriptions used for waste flow information are those provided in the Waste Management (Planning) Regulation, 1997. Local authorities that have engaged either in the preparation of a Waste Management Strategy or a Waste Management Plan will have started collecting data under these headings and the EPA's intention is to harmonise the NWD as much as possible with the statutory Waste Planning information requirements and other waste information requirements.

Form A is divided into two sections; *Waste Streams and Priority Waste Streams*. The waste types for which summary information was sought under the heading *Waste Streams* are:

- Household waste collected by or on behalf of LA;
- Household waste delivered to Civic Amenity sites or bring banks;

- Other Household Waste;
- Litter/Street Sweepings;
- Commercial Waste;
- Industrial Waste Not Otherwise Specified;
- Construction/Demolition Waste;
- Contaminated Soils;
- Ash/Incineration Residues;
- Mining/Quarry Waste;
- Healthcare Waste;
- Sewage Sludges;
- Agricultural Sludges.

These are the types listed in Part 2, section 2.1(a) of the Schedule to the Waste Management (Planning) Regulations.

For each waste type, the following information was sought:

- Total waste arising within functional area in current year as tonnes (A);
- Total waste imported into functional area in current year as tonnes (B);
- Total waste exported from functional area in current year as tonnes (C);
- Total waste managed within functional area in current year as tonnes ((A + B) - C).

For waste streams identified in the Waste Management (Planning) Regulations as being priority (sections 2.1(c) and 2.1(d) of Part 2, Schedule to the Regulations), the same information as above was sought. These waste streams are:

- Paper;
- Glass;
- Plastic;
- Metals – Total;
- Metals – Aluminium;
- Metals – Ferrous;
- Metals - Non-ferrous other than aluminium;
- Textiles;
- Putrescible Waste;
- Electrical/Electronic Goods;
- Batteries/Accumulators;
- Oils;
- PCBs;
- Tyres;
- Scrap Vehicles;
- Packaging Waste – Total;
- Packaging Waste – Paper;
- Packaging Waste – Glass;
- Packaging Waste – Plastic;
- Packaging Waste - Metals – Total;
- Packaging Waste - Metals – Aluminium;
- Packaging Waste - Metals – Ferrous;
- Packaging Waste - Metals - Non-ferrous other than Aluminium;
- Packaging Waste – Textiles.

Form B requested summary information on the disposal/recovery routes of wastes managed within the functional area. The following information was sought for the waste types listed above:

- Total waste managed within functional area as tonnes for current year (A);
- Quantity disposed to landfill as tonnes for current year (B);

- Quantity disposed by other method as tonnes for current year (C);
- Quantity recovered as tonnes for current year (D);

with A=B+C+D.

For *quantity disposed of by methods other than landfill*, the following choices were provided: land treatment, sea disposal, incineration, other. Where wastes were applied to land with a consequential benefit for an agricultural activity or ecological system, this should be considered to be recovery.

Form C requested summary information on hazardous waste arisings and management within the functional area. The following information was sought for each waste type:

- Quantity of hazardous waste managed within functional area as tonnes for current year;
- Quantity of hazardous waste disposed of within functional area as tonnes for current year;
- Quantity of hazardous waste recovered within functional area as tonnes for current year.

Entries would only be expected for those waste types that are known to contain a hazardous fraction or, in the case of priority wastes streams such as batteries/accumulators, oils and PCBs. In considering what is hazardous waste, local authorities were advised to have regard to the definition provided in the Waste Management Act, 1996.

Information on municipal waste arisings was also obtained from waste contractors and recycling organisations and from waste composition surveys of both household and commercial waste conducted by or on behalf of local authorities.

All local authorities completed the survey. In general, the quality of the information was better than for 1995, which reflects the higher priority attached to waste in 1998 and the investment in waste management infrastructure in the intervening years such as weighbridges at waste facilities. However, there were considerable gaps in the information reported on waste flows (Forms A, B and C referred to above) which is a cause for concern. Most local authorities completed Form A, which provides a summary of waste flows for the major waste types such as household waste, commercial waste etc.. However, few local authorities reported waste flow data for priority waste streams and hazardous waste management in their functional areas. A key immediate priority for waste planning in Ireland is that local authorities develop the capacity to track waste flows within their functional areas so that they know what types and quantities of waste are arising in their areas, how much of each type is being exported out of and imported into their functional area, how much of each type is being managed within their functional area and, finally, the routes by which these wastes are being managed.

Data on recycling and recovery is continuing to improve. Many local authorities provided details of recycling activities in their functional areas and this information was supplemented by information obtained directly from recycling organisations.

2.2.3 COMPOSITION ANALYSIS

HOUSEHOLD WASTE

In 1996, the EPA published a methodology for conducting waste composition analysis on household and commercial waste (EPA, 1996). Local authorities were requested, at that time, to follow this procedure so that a uniform dataset on household and commercial waste composition would develop over time.

Ten local authorities have conducted waste composition surveys since 1995. Of particular note were the REMECON surveys conducted by Dublin Corporation, which add significantly to the body of knowledge on household waste composition, and the relatively large number of waste composition surveys conducted by Kerry County Council. Counties without survey results were paired with counties similar in terms of urban/rural population and waste generation. The results from these surveys were used to analyse the urban and rural composition of the household waste stream in each county and the country as a whole by weighting them against the household waste arisings data obtained from the local authority questionnaire. This yielded local

and national figures for each material in the waste stream including glass, paper, metals, plastics, textiles and putresibles. The packaging content of household waste landfilled was also estimated from the results of these waste composition surveys.

COMMERCIAL WASTE

Three commercial waste composition surveys have been reported to the EPA since 1995. The results of these surveys, together with the survey conducted for the National Waste Database project in 1995, were used to obtain national figures for different materials in the commercial waste stream. The packaging content of commercial waste landfilled was also estimated from the results of these waste composition surveys.

2.3 INDUSTRIAL WASTE

2.3.1 DEFINITION

Industrial waste as defined in the Waste Management Act, 1996 includes *waste produced or arising from manufacturing or industrial activities or processes*. For statistical purposes, the EPA has adopted the NACE classification system for categorizing economic activities that produce waste. Sectors included under the general heading 'industrial' are manufacturing, mining, and electricity, gas and water supply.

2.3.2 DETERMINATION OF AMOUNTS ARISING AND DISPOSAL/RECOVERY ROUTES

INDUSTRY QUESTIONNAIRE

The principal means of obtaining information on industrial waste was through a questionnaire. The focus in the industrial sector was on both hazardous waste and non-hazardous waste. All industries employing twenty five people or more in the industrial manufacturing sector were surveyed, representing some 2,273 companies. Contact and other basic information on industries were obtained through Kompass, a supplier of information on industrial activities. This dataset was the most up-to-date commercial database available at the time.

The questionnaire classified waste according to the *European Waste Catalogue* (EWC) and the *Hazardous Waste List* (HWL). The wastes listed in the HWL are those wastes that appear in the EWC which have been deemed to be hazardous. Additional codes were incorporated as required to deal with wastes not covered in sufficient detail by the EWC. The questionnaire also allowed the respondent to indicate that it considered a waste hazardous where the waste was not assigned to a hazardous waste code. In these instances, each record was assessed to determine if the waste was in fact a hazardous waste.

Each company surveyed was also provided with a guidance note and a copy of the EWC and HWL. Questionnaires were also made available in digital format through the EPA web-site and by email or diskette, if requested.

SCALE-UP METHODOLOGY

Completed returns were received from 523 companies. This represents a response rate of 23.1% based on the number of completed returns or 38.7% based on employee numbers compared with equivalent rates of 16% and 22.9% for 1995.

Numerical and statistical methods were used to extrapolate the data obtained from the questionnaire responses to estimate national waste quantities. Respondents were assigned to a NACE sector/subsector based upon their questionnaire. A waste per employee figure was calculated for each respondent and these values were aggregated for each NACE sector to enable an estimation of the total waste generation for each industrial sector. These estimates were compiled to provide an overall industrial waste production estimate. In their simplest form, the scale-up factors are calculated by dividing the total number of employees per sector by the number of employees in that sector for whom completed questionnaires have been received. The approach used in this study, which was based on experience in other countries, allowed for the inclusion of employees involved in non-production activities such as administrative staff.

Statistical Technique

To apply the unadjusted scale-up factor, as described above, to an entire industry sector would be to discount the fact that certain firms within that sector may produce atypically high or low quantities of waste. Such

firms should be excluded from the main scale-up procedure and be added in afterwards, applying a factor of 1.0, an approach used in the IIRS Hazardous Waste Survey (McMahon, Hopkins & Malone 1980). Statistical methods are required in order to determine such anomalies.

Firms with atypical quantities of waste were determined by using the statistical technique of *box-plots* for each industry sector based upon the waste/employee of *each* firm in that sector for which a completed questionnaire has been received. Outlying data points are calculated as follows:

1. The interquartile range (IQR) is determined. The IQR is the numerical difference between the data points at the first and third quartiles of the data series i.e. the middle 50% of data points.

2. Upper and lower fences are set at a numerical distance of 1.5 times the IQR below the data point at the first quartile and 1.5 times the IQR above the data point at the third quartile.

3. Any point which lies outside the upper and lower fences determined in Step (2) is an outlier and the waste generated by that firm will not be scaled-up in accordance with the scale-up factors described earlier.

It should be noted that this method provides a low estimate of industrial waste production in that it excludes any outlying high waste producers in the industry that did not reply. The same methodology has been used to estimate industrial hazardous waste and industrial packaging waste arisings.

2.4 HAZARDOUS WASTE

The most comprehensive information published to date on hazardous waste arisings in Ireland is included in the Proposed National Hazardous Waste Management Plan. The best estimates of hazardous waste arisings for 1998 are presented in this report in a similar format to that used in the proposed plan. The information for 1998 was compiled from information obtained from the industrial survey and the recycling organisations/waste contractors survey together with data provided by the Central Statistics Office (CSO). It was found that additional information was required in relation to the export of hazardous waste. To obtain this information, a short questionnaire was sent to all of the major waste brokers who deal with waste being exported from Ireland. All of the brokers replied to the questionnaire.

Two principal waste categories are used in the presentation of information on hazardous waste - reported and unreported waste. Reported hazardous waste is that for which there is a verifiable source. Unreported waste is that for which there is no defined source of information and estimates were made which are based on import and export data, extrapolations from known quantities and international experience.

2.4.1 REPORTED HAZARDOUS WASTE

Reported hazardous waste is that for which there is a defined source. Information sources used in 1998 include:

- The returns made to the industrial survey. A number of firms recover or dispose of their own hazardous waste on-site. Disposal/recovery activities included solvent recovery and incineration.
- The returns made by merchant hazardous waste recovery and disposal facilities.
- Summary information on export of hazardous waste which was obtained from the main waste brokers.

The dataset constructed for 1996 as part of the Proposed National Hazardous Waste Management Plan was updated with whatever information was available on hazardous waste arisings for 1998 from the surveys conducted.

2.4.2 UNREPORTED HAZARDOUS WASTE

Wherever possible, estimates of unreported hazardous waste were updated to 1998 following the same procedures used in assembling estimates for 1996. In relation to unreported industrial hazardous waste reported quantities were extrapolated using the same methodology as used for the industrial survey. Unreported hazardous waste includes waste from small businesses, households, commercial activities (such as shops, offices and other services) and farms.

2.5 PACKAGING WASTE

Information on packaging waste was obtained from local authorities, industry and recycling organisations/waste contractors surveys. Information was also obtained from REPAK. The Agency has developed best estimates for both packaging waste arisings and quantities of packaging waste recovered for 1998 by combining information from these various sources.

Total packaging waste arisings were estimated as follows. The packaging content of the household and commercial waste stream landfilled was estimated from the results of waste composition surveys conducted on these waste streams while the packaging content of the industrial waste stream was estimated from returns provided by companies surveyed. By combining information on packaging contained in the household, commercial and industrial streams, a best estimate of total packaging arisings was calculated. The best estimate of packaging waste arisings is the sum of household packaging waste landfilled, commercial packaging waste landfilled, packaging waste reported to be recovered by recycling organisations and packaging waste reported by industry considered unreported under the other headings. In relation to the commercial waste stream, it is important to note that there is considerable overlap between waste reported as 'commercial' waste and waste reported as 'industrial' waste and it is therefore likely that a significant fraction of waste reported as 'commercial' actually originates from industrial sources.

Total quantities of packaging waste recovered were estimated from returns received by companies and organisations engaged in recovery of packaging waste, local authority returns and information obtained from the industrial survey. There is a relatively small number of organisations involved in recovery of packaging waste in Ireland with the majority of companies in the recycling sector engaged in the collection and sorting of such wastes.

2.6 OTHER WASTE STREAMS

Information on waste streams such as construction and demolition waste, end-of-life vehicles, scrap tyres, sludges and agricultural waste was abstracted from various sources including the surveys conducted and any other sources available to the Agency.

3. WASTE FLOWS IN IRELAND

3.1 OVERVIEW

National waste arisings for 1998 were estimated to be 80,012,678 tonnes (see Figure 3.1 and Tables 3.1 and 3.2). Of this, approximately 64.6 million tonnes originated from agricultural sources, mainly animal manures. The municipal and industrial sectors are therefore estimated to have produced over 16 million tonnes of waste in 1998.

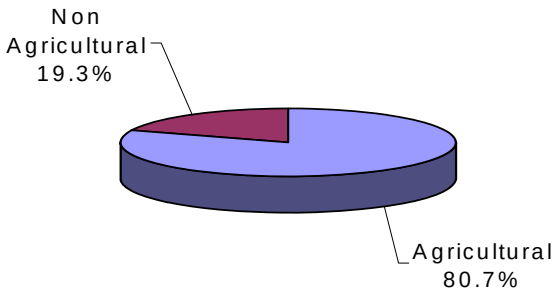


Figure 3.1: National Waste Arisings

Table 3.1: Comparison of Estimated Arisings for 1995 and 1998

Waste Category	1998		1995	
	(tonnes/annum)	(%)	(tonnes/annum)	(%)
Agricultural	64,578,724	80.7	31,000,000	73.4
Manufacturing	4,876,406	6.1	3,540,226	8.4
Energy, Gas & Water Supply	448,674	0.6	351,849	0.8
Mining & Quarrying	3,510,778	4.4	2,200,002	5.2
Hazardous Waste	370,328	0.5	243,754	0.6
Municipal Waste	2,056,652	2.6	1,848,232	4.4
End-of-Life Vehicles/ Scrap Metal	187,484	0.2	52,154[1]	0.1
Construction & Demolition Waste	2,704,958	3.4	1,318,908	3.1
Urban Wastewater Sludges	505,686[2]	0.6	851,380	2.0
Drinking Water Sludges	38,988	0.0	58,095	0.1
Dredge Spoils	734,000	0.9	784,600	1.9
TOTAL	**80,012,678**		**42,249,200**	

[1] 1995 figure relates solely to end of life vehicles
[2] This figure is based on a lower percentage solids than was applied in 1998. The actual quantities arising as TDS are virtually the same.

A comparison of best estimates of waste arisings for 1995 and 1998 is presented in Tables 3.1 and 3.2 and Figure 3.2. The increase in quantities of agricultural waste is partly a result of changes in the method of calculation. These changes include the inclusion of dirty water washings from the dairy sector and the assumption that cattle are kept indoors for a four-month period as opposed to a three-month period, which increases the amounts of cattle manure and slurry considerably. The increases in other waste types are due in part to improved reporting by local authorities and industry. However, based on specific waste streams, where historical data is considered to be reasonably reliable, it is clear that waste quantities are increasing more or less in line with economic growth.

Table 3.2: Comparison of Estimated Non-Agricultural Arisings between 1995 and 1998

Waste Category	1998		1995	
	(tonnes/annum)	(%)	(tonnes/annum)	(%)
Manufacturing	4,876,406	31.6	3,540,226	31.5
Energy, Gas & Water Supply	448,674	2.9	351,849	3.1
Mining & Quarrying	3,510,778	22.7	2,200,002	19.6
Hazardous Waste	370,328	2.4	243,754	2.2
Municipal Waste	2,056,652	13.3	1,848,232	16.4
End-of-Life Vehicles/ Scrap Metal	187,484	1.2	52,154	0.5
Construction & Demolition Waste	2,704,958	17.5	1,318,908	11.7
Urban Wastewater Sludges	505,686	3.3	851,380	7.6
Drinking Water Sludges	38,988	0.3	58,095	0.5
Dredge Spoils	734,000	4.8	784,600	7.0
TOTAL	**15,433,954**		**11,249,200**	

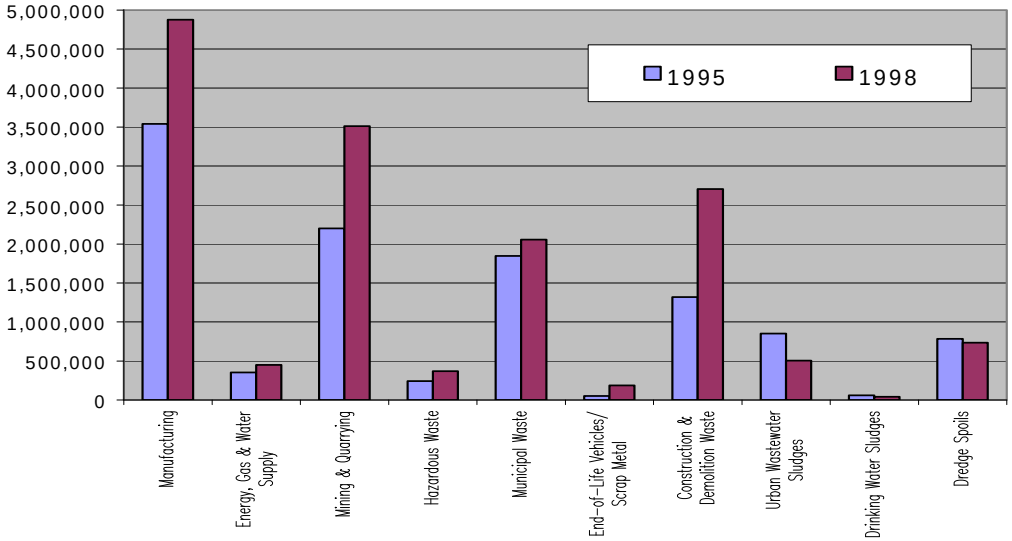


Figure 3.2 Comparison of Non-Agricultural Waste Arisings in 1995 and 1998

Waste flows in Ireland in 1998 are summarised in Table 3.3 for reported non-agricultural waste arisings.

Table 3.3: Waste Flows in Ireland for Reported Wastes, 1998

WASTE CATEGORY/SECTOR	ARISINGS	DISPOSAL		RECOVERY		UNSPECIFIED	
	(tonnes/annum)	(%)		(%)		(%)	
Manufacturing	3,680,013	1,786,969	48.6	1,892,997	51.4	47	0.0
Energy, Gas & Water Supply	448,674	376,980	84.0	71,695	16.0		0.0
Mining & Quarrying	3,510,778	3,498,061	99.6	12,717	0.4		0.0
Hazardous Waste	296,017	109,669	37.0	161,140	54.4	25,208	8.5
Municipal Waste[1]	1,933,449	1,766,765	91.4	166,684	8.6		0.0
End-of-Life Vehicles/ Scrap Metal	187,484	7,500	4.0	179,984	96.0		0.0
Construction & Demolition Waste	2,704,958	1,533,386	56.7	1,171,572	43.3		0.0
Urban Wastewater Sludges	505,686	471,867	93.3	29,686	5.9	4,133	0.8
Drinking Water Sludges	38,988	38,988	100.0	0	0.0		0.0
Dredge Spoils	734,000	694,000	94.6	40,000	5.4		0.0
TOTAL	**14,040,047**	**10,284,185**	**73.2**	**3,726,457**	**26.6**	**29,388**	**0.2**

[1] Municipal waste in Table 3.3 is reported household and commercial waste and reported street cleansing waste

3.2 MUNICIPAL WASTE

3.2.1 AMOUNTS ARISING AND WASTE COMPOSITION

It is estimated that 2,056,652 tonnes of municipal waste was generated in Ireland in 1998. This consisted of 1,220,856 tonnes of household waste[1], 754,797 tonnes of commercial waste and 80,999 tonnes of street cleansing waste. This compares with a best estimate of 1,848,232 tonnes of municipal waste in 1995 (1,324,521 tonnes from households, 476,920 tonnes from the commercial sector and 46,791 tonnes of street cleansing wastes). The composition of household and commercial waste reported landfilled by local authorities for 1998 is illustrated in Figures 3.3 and 3.4.

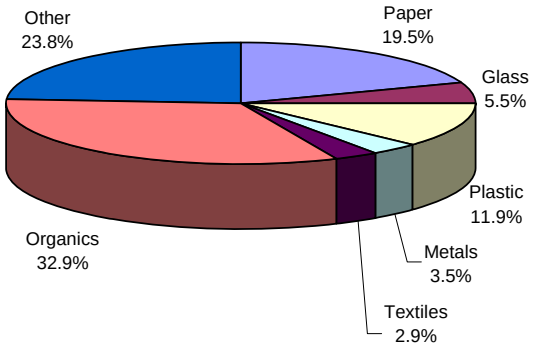


Figure 3.3: Composition of Household Waste Landfilled in Ireland

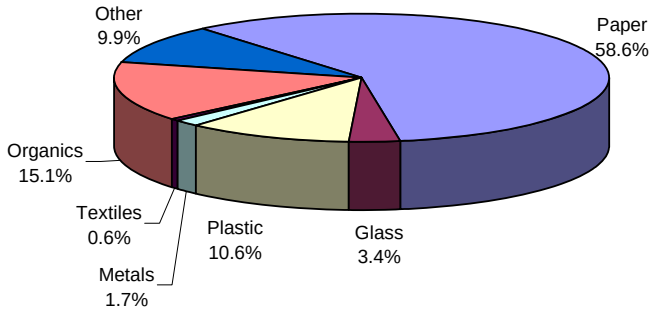


Figure 3.4: Estimated Composition of Commercial Waste Landfilled in Ireland

[1] Consists of household waste collected by or on behalf of local authorities, household waste delivered to Civic Waste Facilities or bring banks and other Household Waste (including waste from households not provided with a collection service)

A county by county breakdown of municipal wastes arising in 1998, as reported by local authorities, is provided in Table 3.4.

Table 3.4: Municipal Wastes Arising in Each Local Authority Area (as tonnes per annum)

Local Authority Name	Household Waste	Commercial	Street Cleansing	TOTAL
Carlow County Council	12,200	9,300	300	21,800
Cavan County Council	17,472	13,236	2,162	32,870
Clare County Council	31,813	13,390	1,640	46,843
Cork Corporation	63,764	62,319	6,250	132,333
Cork County Council	119,343	29,672	5,443	154,458
Donegal County Council	26,000	5,000	2,000	33,000
Dublin Corporation	166,333	160,187	35,000	361,520
Dun Laoghaire- Rathdown County Council	53,867	56,288	2,729	112,884
Fingal County Council	55,993	22,550	1,896	80,439
Galway Corporation	18,500	47,000	3,000	68,500
Galway County Council	27,647	7,700	0	35,347
Kerry County Council	26,845	31,784	1,702	60,331
Kildare County Council	42,471	26,606	100	69,177
Kilkenny County Council & Corporation	24,559	5,254	1,744	31,557
Laois County Council	23,352	6,336	500	30,188
Leitrim County Council	9,667	2,000	0	11,667
Limerick Corporation	26,000	25,000	2,000	53,000
Limerick County Council	29,500	16,000	600	46,100
Longford County Council	15,079	1,082	0	16,161
Louth County Council	28,671	22,903	2,454	54,028
Mayo County Council	52,356	10,821	0	63,177
Meath County Council	34,650	23,044	480	58,174
Monaghan County Council	16,933	12,828	1,366	31,127
Offaly County Council	17,510	7,513	0	25,023
Roscommon County Council	18,535	5,213	3,200	26,948
Sligo County Council	17,890	5,854	1,745	25,489
South Dublin County Council	70,400	52,369	1150	123,919
Tipperary NR County Council	18,403	4,793	818	24,014
Tipperary SR County Council	27,291	9,300	1,300	37,891
Waterford Corporation	18,280	8,800	520	27,600
Waterford County Council	12,401	4,900	0	17,301
Westmeath County Council	23,020	3,276	0	26,296
Wexford County Council	29,045	23,163	300	52,508
Wicklow County Council	45,066	19,316	600	64,982
TOTAL	**1,220,856**	**754,797**	**80,999**	**2,056,652**

Considerable efforts have been made by local authorities in the past few years to establish the composition of household wastes arising in their functional areas. Figures 3.3 and 3.5 provide a summary of the results of waste composition surveys conducted. The majority of these composition surveys have been conducted according to a standard procedure developed by the EPA for characterisation of household and commercial wastes. The average packaging content of the household waste stream was estimated to be 28.3%. Of

particular note in relation to waste composition analysis is the REMECOM project in which Dublin Corporation participated (see Topic Box 3.1).

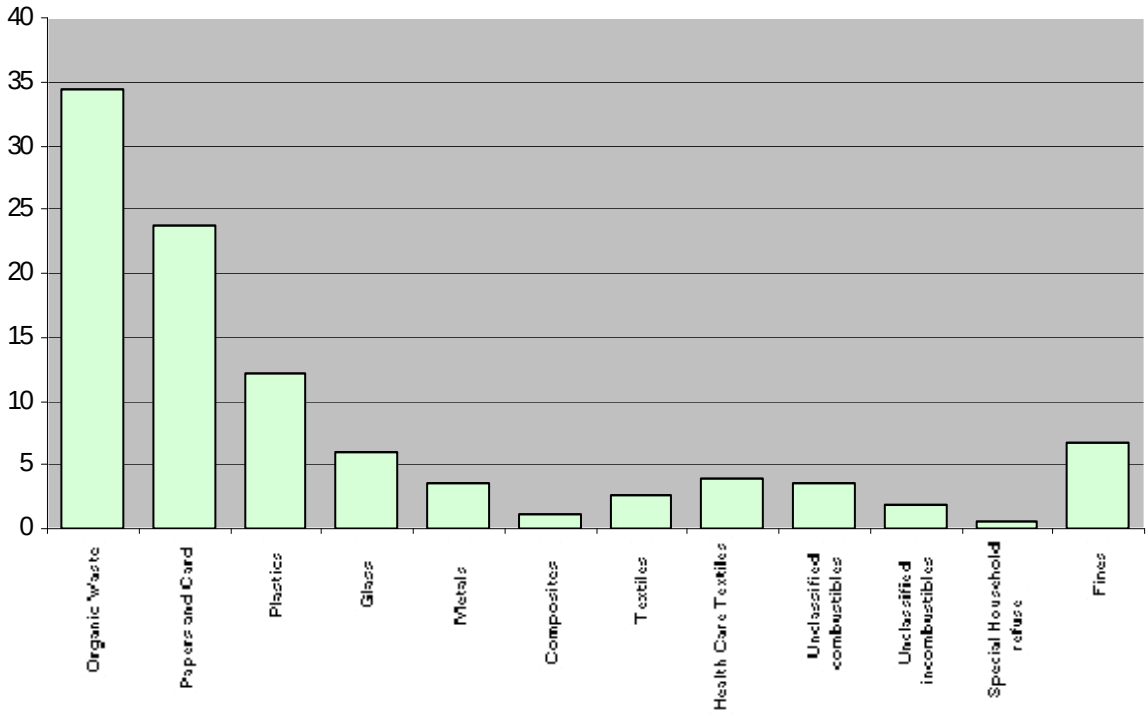
Box 3.1: REMECOM Project

The REMECON project was created in 1995 by the French Environmental Protection Agency (ADEME) with funding provided by the EU. Seventeen communities (ten from France, and the remainder from Germany, Belgium, Ireland, Italy and the United Kingdom) participated in the project by carrying out household waste composition surveys using a standardised methodology. Dublin Corporation participated in the project and undertook four household waste characterisation campaigns between June 1996 and December 1997. Four target populations (sectors) were assessed as part of the project. Sectors 1, 2 and 3 related to different social groupings and sector 4 related to kerbside collection areas. The social groupings were defined as:

Class A: Professional, managerial, proprietors with or without employees;
Class B: Other non manual and skilled manual;
Class C: Unskilled or semi-skilled manual.

Average waste production by each of these sectors worked out at 14.07, 15.33 and 21.07 Kg/house/week respectively.

In all, 63 samples were analysed. The average composition of household waste is illustrated below:



It should be noted that a slightly different fraction classification system was used from the EPA classification system.

In relation to the proportion and composition of packaging waste the percentage of the total remained relatively constant throughout each campaign at around 25% by weight. The main packaging component was polyolefin films (supermarket bags and refuse sacks) which accounted for almost 8% by weight of the total waste.

A comparison between urban and rural household waste composition is provided in Table 3.5 and Figure 3.5. Some differences were observed and the higher percent composition of paper in the urban waste stream is considered significant; it confirms observations made in earlier surveys (EPA, 1996). Interestingly, no significant difference was observed between the organic waste composition of urban and rural waste streams: earlier surveys suggested a higher percentage in the urban waste stream. Using the pairing procedure

described in Chapter Two, each local authority was assigned a set of household waste composition results either from their own surveys or by being paired with a similar local authority that conducted a survey. These county by county results are presented in Appendix E. The increased number of waste composition surveys conducted by local authorities enables a much greater level of confidence to be attached to the national figures for different materials such as glass, paper and plastic in the household stream.

Ideally, surveys should be conducted in both summer and winter to more accurately reflect seasonal variation. Furthermore, the likely significant seasonal impact of tourism on waste composition in areas with large tourist populations is not accounted for in present figures. Local authorities which cater for large tourist populations should take this into account when conducting waste composition surveys.

Table 3.5: Urban & Rural Household Waste Composition

Material	Urban Waste (%)	Rural Waste (%)	Total (%)
Paper	21.6	16.3	19.5
Glass	5.2	5.9	5.5
Plastics	12.2	11.4	11.9
Metals	3.3	3.8	3.5
Textiles	2.7	3.2	2.9
Organics	32.4	33.7	32.9
Other	22.6	25.7	23.8

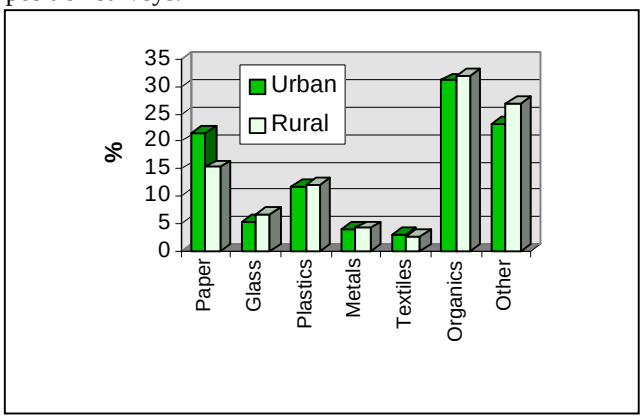


Figure 3.5: Comparison of Urban and Rural Waste Composition

For commercial waste, a number of surveys have been conducted since 1995. The commercial waste stream is considerably more diverse than the household waste stream as it comes from many sources such as supermarkets, offices, institutions, all of which have their own characteristic waste 'finger print'. Available information on commercial waste composition is presented in Figure 3.6.

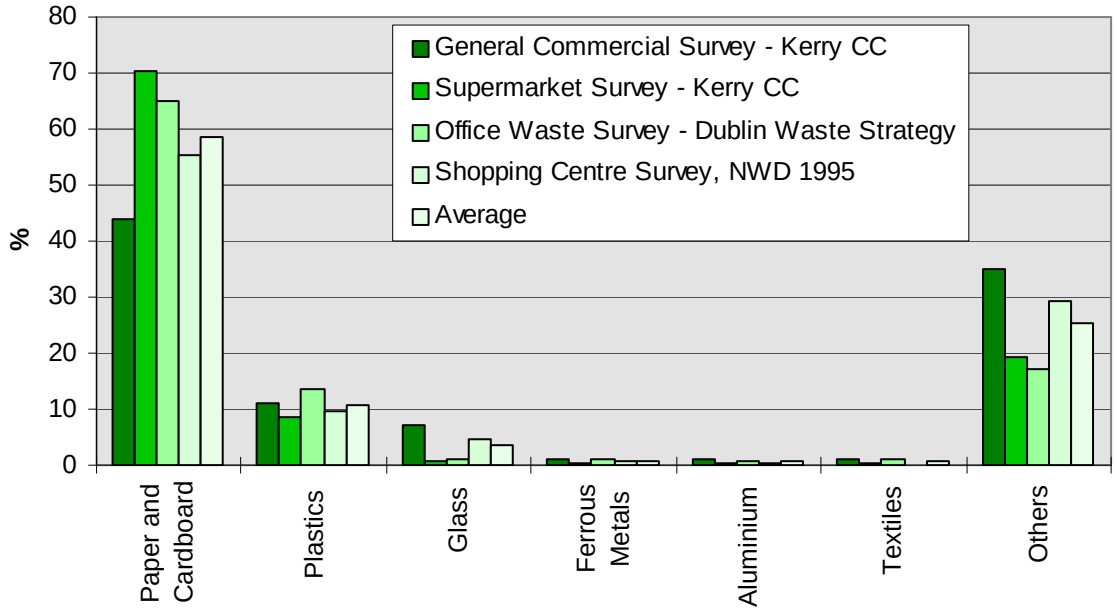


Figure 3.6: Summary of Commercial Waste Surveys Conducted in Ireland Since 1995

There is still a significant gap in data relating to commercial waste composition. Since 1995, three additional surveys have been carried out: two by Kerry County Council and one by the MCCK group as part of the preparation of the Dublin Region Waste Management Strategy. One of the Kerry surveys was carried out on a large supermarket while the other was a general commercial waste survey of Tralee town. The MCCK survey

related to commercial waste arising from office-based commercial activities. The information from these surveys was combined with the information from the commercial waste composition survey conducted at a shopping centre in Dublin for the 1995 NWD report. The 1995 survey related to a number of commercial outlets which were surveyed including a building society, a chiropractor, a fruit and vegetable shop, a hardware store, a butcher, a newsagent, a florist and a photographic laboratory. A summary of the data from each of the surveys is presented in Table 3.6.

Table 3.6: Summary of Commercial Waste Composition Surveys (% Composition)

	Kerry General commercial survey	Kerry Supermarket survey	MCCK Office Waste Survey	1995 Finglas Survey	Average
Paper	43.7	70.4	65.0	55.3	**58.6**
Plastics	10.9	8.5	13.6	9.5	**10.6**
Glass	7.1	0.6	1.2	4.8	**3.4**
Ferrous Metals	1.9	0.2	1.2	0.7	**1.0**
Aluminium	0.9	0.5	0.6	0.5	**0.6**
Other Metals	0.2	0.0	0.0	0.0	**0.1**
Textiles	1.1	0.4	1.0	0.0	**0.6**
Organics	13.5	12.0	12.6	22.3	**15.1**
Others	20.6	7.4	4.7	7.0	**9.9**
	100.0	**100.0**	**100.0**	**100.0**	**100.0**

The surveys carried out since 1995 have significantly increased the level of information available on the composition of commercial waste. However, some commercial sectors have not been represented in these surveys. Most notable of these omissions in the hotel and catering sector, which tends to produce wastes with high percentages of putrescible matter. This gap in the available data may have a significant effect on the relative percentages of the various waste fractions and for this reason, a degree of caution is required when applying the results of these surveys to gross quantities of waste collected. The average packaging content of the commercial waste stream was estimated to be 51.1% which is significantly higher than that estimated for 1995 (33.3%).

RECOMMENDATION

As the results of waste composition surveys are used to estimate total packaging waste arisings in Ireland, there is an urgent need for more comprehensive information on the composition of the commercial waste stream.

3.2.2 DISPOSAL AND RECOVERY ROUTES

Information on disposal and recovery routes for municipal wastes was obtained from the local authority questionnaire and the recycling organisation questionnaire. Of the 1,852,450 tonnes of household and commercial waste collected in Ireland in 1998, 1,685,766 tonnes were consigned to landfill with 166,684 tonnes recovered. This compares with 1,385,439 tonnes landfilled in 1995 and 117,732 tonnes recovered. The difference between estimated household and commercial waste arisings in 1998, as presented in Table 3.4 (1,975,653 tonnes), and the amount reported as collected (1,852,450 tonnes) represents an estimate of the quantity of waste arising in households not provided with a waste collection service.

The composition of household and commercial waste landfilled in Ireland is provided in Table 3.7, with the disposal and recovery rates for different materials in the combined household and commercial waste stream presented in Table 3.8. Disposal and recovery rates for the household waste stream are presented in Table 3.9 with rates for the commercial waste stream presented in Table 3.10.

The national recovery rate for the combined household and commercial waste stream in 1998 is estimated to be 9.0% compared with 7.8% in 1995. The increase in recovery activity has been predominantly in the commercial sector where the total quantity reported to be collected for recovery has increased from 73,191 tonnes in 1995 to 129,166 tonnes in 1998, corresponding to an overall increase in the recovery rate for commercial waste from 15.3% in 1995 to 18.7% in 1998. In sharp contrast, the recovery rate for the household waste stream has fallen from 4.5% in 1995 to 3.2% in 1998, mainly as a result of the fall off in the collection of waste paper from the household sector. It should be noted that the overall recovery rate for the household and commercial waste stream is very much influenced by the quantities of paper waste being

reported to be recovered. Volatility in the paper recovery sector and markets for paper and board are therefore likely to have radical impacts on national recovery rates. In the same period there has been an increase in the recovery of glass from households from 13.7% in 1995 to 18.6% in 1998. Battery recycling has also grown significantly with 5,167 tonnes collected for recovery in 1998.

While there has only been a marginal increase in the overall recovery rate for household and commercial waste due to increasing quantities reported to be landfilled, it should be noted that the gross quantities recovered have increased from 117,732 tonnes in 1995 to 166,684 tonnes in 1998, an increase of 42% in three years. Considerable effort has been expended in supporting infrastructure for improved waste recovery through the 1994-1999 Operation Programme for Environmental Services and this is reflected by growth in infrastructure during the period (see Chapter 4) and the increased quantities of material being reported to be recovered.

Table 3.7: Composition of Household and Commercial Waste Landfilled in Ireland

Material	Household		Commercial		Total	
	(%)	(tonnes/annum)	(%)	(tonnes/annum)	(%)	(tonnes/annum)
Paper	19.5	219,573	58.6	328,277	32.5	547,849
Glass	5.5	61,526	3.4	19,232	4.8	80,757
Plastic	11.9	133,453	10.6	59,475	11.4	192,927
Ferrous	2.0	22,793	1.0	5,698	1.7	28,491
Aluminium	1.0	11,231	0.6	3,493	0.9	14,724
Other Metals	0.5	5,828	0.1	381	0.4	6,209
Textiles	2.9	32,708	0.6	3,434	2.1	36,142
Organics	32.9	370,542	15.1	84,662	27.0	455,204
Others	23.8	268,046	9.9	55,417	19.2	323,463
Total	**100.0**	**1,125,698**	**100.0**	**560,068**	**100.0**	**1,685,766**

Note: 'Others' mainly consists of composites, fine elements such as ash, unclassified incombustibles and unclassified combustibles including wood waste.

Table 3.8: Disposal and Recovery Rates in the Household and Commercial Waste Stream in Ireland

Material	Quantity Landfilled	Quantity Recovered	Gross Quantity Available	National Landfill Rate	National Recovery Rate
	(tonnes/annum)	(tonnes/annum)	(tonnes/annum)	(%)	(%)
Paper	547,849	94,302	642,151	85.3	14.7
Glass	80,757	36,000	116,757	69.2	30.8
Plastic	192,927	7,476	200,403	96.3	3.7
Ferrous	28,491	4,069	32,559	87.5	12.5
Aluminium	14,724	731	15,455	95.3	4.7
Other Metals	6,209	28	6,236	99.6	0.4
Textiles	36,142	3,247	39,388	91.8	8.2
Organics	455,204	5,665	460,869	98.8	1.2
Others[1]	323,463	15,167	338,630	95.5	4.5
Total	**1,685,766**	**166,684**	**1,852,450**	**91.0**	**9.0**

Note [1]: 'Others - Recovered' consists of wooden pallets and batteries

Table 3.9: Disposal and Recovery Rates in the Household Waste Stream in Ireland

Material	Quantity Landfilled	Quantity Recovered	Gross Quantity Available	National Landfill Rate	National Recovery Rate
	(tonnes/annum)	(tonnes/annum)	(tonnes/annum)	(%)	(%)
Paper	219,573	7,150	226,723	96.8	3.2
Glass	61,526	14,100	75,626	81.4	18.6
Plastic	133,453	648	134,100	99.5	0.5
Ferrous	22,793	1,062	23,854	95.5	4.5
Aluminium	11,231	480	11,711	95.9	4.1
Other Metals	5,828	0	5,828	100.0	0.0
Textiles	32,708	3,247	35,954	91.0	9.0
Organics	370,542	5,665	376,207	98.5	1.5
Others[1]	268,046	5,167	273,213	98.1	1.9
Total	**1,125,698**	**37,518**	**1,163,216**	**96.8**	**3.2**

Note [1]: 'Others - Recovered' consists of batteries

Table 3.10: Disposal and Recovery Rates in the Commercial Waste Stream in Ireland

Material	Quantity Landfilled	Quantity Recovered	Gross Quantity Collected	National Landfill Rate	National Recovery Rate
	(tonnes/annum)	(tonnes/annum)	(tonnes/annum)	(%)	(%)
Paper	328,277	87,152	415,429	79.0	21.0
Glass	19,232	21,900	41,132	46.8	53.2
Plastic	59,475	6,828	66,303	89.7	10.3
Ferrous	5,698	3,007	8,705	65.5	34.5
Aluminium	3,493	251	3,744	93.3	6.7
Other Metals	381	28	409	93.3	6.7
Textiles	3,434	0	3,434	100.0	0.0
Organics	84,662	0	84,662	100.0	0.0
Others[1]	55,417	10,000	65,417	84.7	15.3
Total	**560,068**	**129,166**	**689,234**	**81.3**	**18.7**

Note [1]: 'Others - Recovered' consists of pallets

3.3 INDUSTRIAL WASTE

3.3.1 DEFINITION

Industrial waste is defined in the Waste Management Act as follows: *'industrial waste' includes waste produced or arising from manufacturing or industrial activities or processes*. For statistical purposes, the EPA has adopted the NACE classification system for categorizing economic activities that produce waste. Sectors included under the general heading 'industrial' are manufacturing, mining, and electricity, gas and water supply.

3.3.2 AMOUNTS ARISING AND WASTE COMPOSITION

National reported and projected figures for hazardous and non-hazardous industrial waste arisings in 1998 are presented in Table 3.11. Total reported figures for non-hazardous and hazardous industrial waste were 7,639,465 tonnes and 219,974 tonnes, respectively. Using the scale-up procedure described in Chapter Two, this gives rise to extrapolated figures of 9,074,751 tonnes of non-hazardous industrial waste and 238,892 tonnes of hazardous industrial waste. As with all figures obtained through extrapolation, the projected figures should be viewed with a certain amount of caution and considered only as best estimates of total industrial

waste arisings in Ireland. The county by county distribution of reported industrial waste is presented in Figure 3.7 and Table 3.12.

Historical data on industrial waste arisings is incomplete and it is difficult to establish reliable trends. However, similar surveys were conducted for the National Waste Database in 1995 and 1998 and, while it is clear that the standard of reporting was considerably better in 1998, a direct comparison of estimated quantities suggests a growth in industrial waste, as defined above, from 6.2 million tonnes in 1995 to 9.7 million tonnes in 1998. This is a 56% increase on 1995 estimates and can in part be attributed to the sustained level of economic growth in Ireland during the intervening period as well as considerably improved reporting.

Table 3.11: Summary of Reported and Projected Quantities of Industrial Waste Arising in 1998

	Hazardous Industrial Waste (tonnes/annum)	Non-Hazardous Industrial Waste (tonnes/annum)	Total Industrial Waste (tonnes/annum)
Reported Quantities	219,974	7,639,465	7,859,439
Projected Quantities	238,892	8,835,859	9,074,751

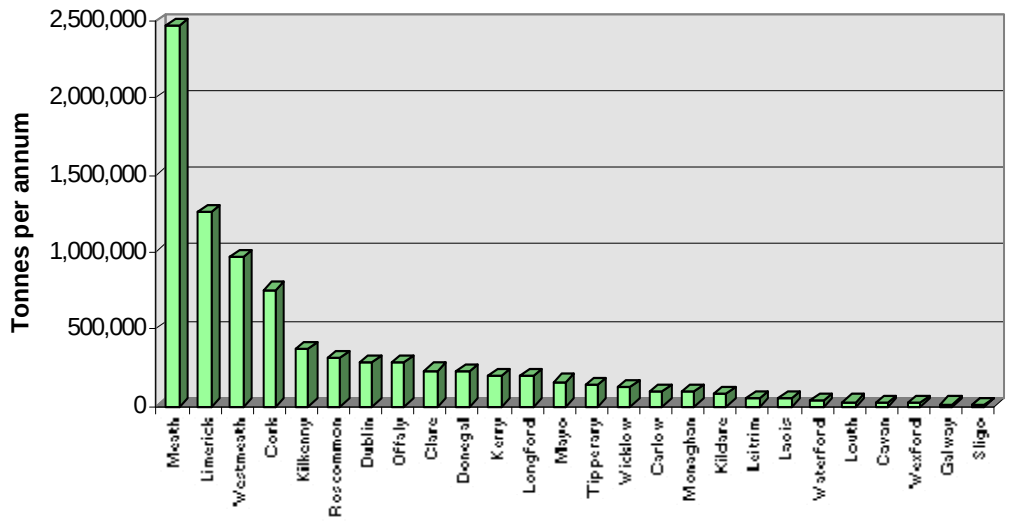


Figure 3.7: Reported Industrial Waste Arisings in Ireland by County

Table 3.12: Reported Industrial Waste Arisings by County

County	Quantity (tonnes/annum)
Meath County	2,463,216
Limerick City and County	1,265,964
Cork City and County	741,674
Westmeath County	508,868
Kilkenny County	359,659
Roscommon County	309,367
Offaly County	282,007
Clare County	231,047
Donegal County	221,460

County	Quantity (tonnes/annum)
Dublin City and County	221,096
Kerry County	193,350
Longford County	189,008
Mayo County	158,284
Tipperary County	135,475
Monaghan County	88,912
Carlow County	79,924
Kildare County	77,037
Wicklow County	59,084
Leitrim County	51,005
Laois County	47,436
Wexford County	47,245
Cavan County	42,272
Waterford City and County	40,680
Louth County	29,278
Galway City and County	10,384
Sligo County	5,705
TOTAL	**7,859,439**

A breakdown of reported and projected hazardous and non-hazardous waste arisings by industry sector is presented in Table 3.13. Sectors that reported greater than 1 million tonnes of non-hazardous industrial waste per annum were chemicals and chemical products, food products and mining. While not reported in this section, the construction and demolition sector also produced waste in excess of 1 million tonnes in 1998. Other sectors with more that 100,000 tonnes of non-hazardous industrial waste generated were: electricity, gas and water supplies, other non metallic mineral products (including quarrying) and wood and wood products.

Reported industrial waste arisings were also categorised according to the codings provided in the European Waste Catalogue (EWC) and Hazardous Waste List (HWL). Hazardous and non-hazardous industrial waste arisings categorised by the main headings in the EWC and HWL are presented in Table 3.14. Only reported quantities are listed because the scale-up methodology used in the study did not extend to the projection of quantities for individual waste types. A detailed breakdown of reported industrial wastes categorised according to the EWC and HWL is provided in Appendix B2. The top ten non-hazardous wastes reported account for 78% of total reported non-hazardous industrial waste while the top ten hazardous wastes reported account for 86% of the total reported hazardous industrial waste (see Topic Box 3.2).

Box 3.2: Top Ten Reported Non Hazardous and Hazardous Industrial Wastes

Top Ten Reported Non-Hazardous Industrial Wastes

EWC Code	Non-Hazardous Waste Description	Tonnes
01 03 01	tailings (from further physical and chemical processing of metaliferous minerals)	2,112,302
01 01 02	waste from mineral non-metaliferous excavation (from mineral excavation)	1,033,231
01 03 03	red mud from the alumina production (from further physical and chemical processing of metaliferous minerals)	781,954
02 02 04	sludges from on-site effluent treatment (from the preparation and processing of meat, fish and other foods of animal origin)	490,644
02 02 02	animal tissue waste (from the preparation and processing of meat, fish and other foods of animal origin)	378,505
01 01 01	waste from mineral metaliferous excavation (from mineral excavation)	350,000
01 03 99	wastes not otherwise specified (from further physical and chemical processing of metaliferous minerals)	266,130
10 01 02	coal fly ash (from power stations and other combustion plants)	194,301
01 04 01	waste gravel and crushed rocks (from further physical and chemical processing of non-metaliferous minerals)	184,728
17 07 01	Mixed construction and demolition waste	149,917
Total		**5,941,713**

Top Ten Reported Hazardous Industrial Wastes

EWC Code	Hazardous Waste Description	Tonnes
07 05 04	other organic solvents, washing liquids and mother liquors (from the MFSU[1] of pharmaceuticals)	60,314
07 07 04	other organic solvents, washing liquids and mother liquors (from the MFSU of fine chemicals and chemical products not otherwise specified)	50,133
07 05 01	aqueous washing liquids and mother liquors (from the MFSU of pharmaceuticals)	28,440
06 03 99	wastes not otherwise specified (waste salt and their solutions from inorganic chemical processes)	28,111
07 05 03	organic halogenated solvents, washing liquids and mother liquors (from the MFSU of pharmaceuticals)	6,790
05 01 03	tank bottom sludges (from petroleum refining, natural gas purification and pyrolytic treatment of coal)	6,003
07 07 01	aqueous washing liquids and mother liquors (from the MFSU of fine chemicals and chemical products not otherwise specified)	3,287
07 07 08	other still bottoms and reaction residues (from the MFSU of fine chemicals and chemical products not otherwise specified)	2,718
06 02 01	calcium hydroxide (from inorganic chemical processes)	2,576
20 01 12	paint, inks, adhesives and resins	1,805
Total		**190,177**

Table 3.13: Summary of Reported and Projected Industrial Waste Arisings in Ireland in 1998

SECTOR	NACE code	HAZARDOUS		NON-HAZARDOUS		TOTAL INDUSTRIAL	
		Reported	Projected	Reported	Projected	Reported	Projected
		(tonnes/annum)					
MINING							
Mining (excludes quarrying)	**C**	**865**	**865**	**3,510,778**	**3,510,778**	**3,511,643**	**3,511,643**
MANUFACTURING							
Food Products; Beverages and Tobacco	**DA**	2,055	2,343	1,635,249	2,356,418	1,637,303	2,358,761
Textiles and Textile Products	**DB**	864	932	82,219	116,052	83,083	116,984
Leather and Leather Products	**DC**	23	23	21,034	53,790	21,057	53,813
Wood and Wood Products	**DD**	1,052	1,061	243,207	287,257	244,259	288,318
Pulp, Paper and Paper Products; Printing, Publishing	**DE**	168	1,107	19,330	164,267	19,498	165,374
Coke, Refined Petroleum Products and Nuclear Fuel	**DF**	6,690	6,690	22,584	22,584	29,274	29,274
Chemicals, Chemical Products and Man-Made Fibres	**DG**	196,397	208,592	1,302,663	1,324,407	1,499,059	1,532,998
Rubber and Plastic Products	**DH**	889	1,051	16,769	24,974	17,658	26,025
Other Non-Metallic Mineral Products (includes quarrying)	**DI**	750	874	212,137	265,755	212,887	266,629
Basic Metals and Fabricated Metal Products	**DJ**	4,614	5,497	82,162	114,301	86,776	119,798
Machinery and Equipment not elsewhere classified	**DK**	422	1,975	3,322	40,118	3,744	42,093
Electrical and Optical Equipment	**DL**	2,460	4,385	21,284	48,401	23,744	52,786
Transport Equipment	**DM**	1,542	2,183	5,702	32,228	7,244	34,411
Manufacturing not elsewhere classified	**DN**	219	348	12,350	25,856	12,569	26,204
SUB-TOTAL - MANUFACTURING		**218,144**	**237,061**	**3,680,013**	**4,876,406**	**3,898,156**	**5,113,468**
ELECTRICITY, GAS & WATER SUPPLY							
Electricity, Gas and Water Supply	**E**	**966**	**966**	**448,674**	**448,674**	**449,640**	**449,640**
TOTAL		**219,974**	**238,892**	**7,639,465**	**8,835,859**	**7,859,439**	**9,074,751**

Table 3.14: Reported Hazardous and Non-Hazardous Industrial Waste Arisings in Ireland Categorised According to the European Waste Catalogue (EWC) and Hazardous Waste List (HWL)

EWC/HWL MAIN CATEGORIES		HAZARDOUS	NON-HAZARDOUS
		(tonnes/annum)	(tonnes/annum)
01 00 00	waste resulting from exploration, mining, dressing and further treatment of minerals and quarry	0	4,730,446
02 00 00	waste from agriculture, horticulture, hunting, fishing and aquaculture primary production, food preparation and	3	1,595,126
03 00 00	waste from wood processing and the production of paper, cardboard, pulp, panels and furniture	499	233,636
04 00 00	wastes from the leather and textile industries	36	86,476
05 00 00	wastes from petroleum refining, natural gas purification, and pyrolytic treatment of coal	6,003	1,466
06 00 00	wastes from inorganic chemical processes	32,073	16,513
07 00 00	wastes from organic chemical processes	160,138	87,129
08 00 00	wastes from the MFSU of coatings, adhesive, sealants and printing inks	1,548	3,964
09 00 00	wastes from the photographic industry	39	1
10 00 00	inorganic wastes from thermal processes	1,524	408,064
11 00 00	inorganic waste with metals from metal treatment and the coating of metals; non-ferrous hydrometallurgy	1,499	175
12 00 00	wastes from shaping and surface treatment of metals and plastics	528	18,818
13 00 00	oil wastes (except 05 00 00 and 12 00 00)	3,941	100
14 00 00	wastes from organic substances employed as solvents (except 07 00 00 and 08 00 00)	885	0
15 00 00	packaging; absorbents, wiping cloths, filter materials and protective clothing not otherwise specified	1,017	68,650
16 00 00	waste not otherwise specified in the catalogue	1,039	6,940
17 00 00	construction and demolition waste (including road construction)	80	132,711
18 00 00	wastes from human or animal health care and/or related research (excluding kitchen and restaurant wastes which do not arise from immediate health care)	1,731	50
19 00 00	wastes from waste treatment facilities, off-site wastewater treatment plants and the water industry	3,904	165,459
20 00 00	municipal wastes and similar commercial, industrial and institutional wastes including separately collected fractions	3,487	83,743
TOTAL		**219,974**	**7,639,465**

3.3.3 DISPOSAL/RECOVERY ROUTES

The disposal and recovery routes for total reported hazardous and non-hazardous industrial waste are summarised in Table 3.15 and illustrated in Figure 3.8. In total, 5,771,166 tonnes (73.4%) were disposed of through various routes, principally landfill, with 2,088,111 tonnes (26.6%) recovered. This compares with 3,493,510 tonnes (87.9%) reported disposed of by similar activities in 1995 and 480,766 tonnes (12.4%) reported to be recovered. A summary of disposal/recovery practices for each industrial sector is presented in Table 3.16.

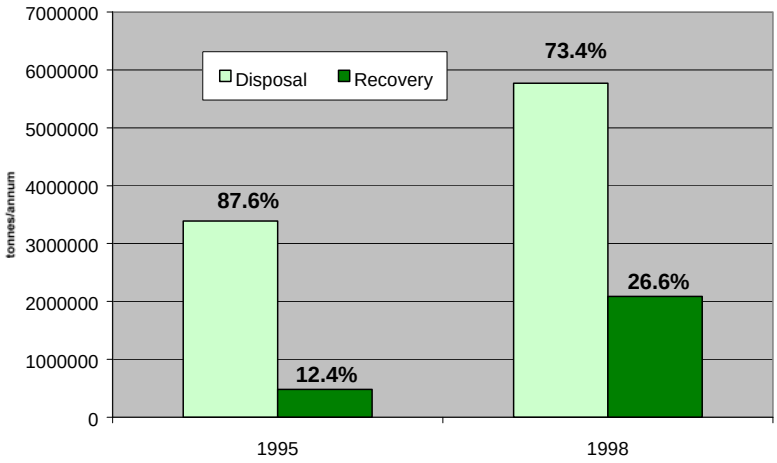


Figure 3.8: Summary of Disposal and Recovery Rates for Industrial Waste in Ireland, 1995 and 1998

Table 3.15: Summary of Disposal/Recovery Routes for Reported Industrial Waste in Ireland

		NON-HAZARDOUS		HAZARDOUS		TOTAL	
Disposal Recovery Code	**Disposal Recovery Route**	**(tonnes/ annum)**	**(%)**	**(tonnes/ annum)**	**(%)**	**(tonnes/ annum)**	**(%)**
D1	Landfill	5,305,430	694	32,740	14.9	5,338,170	67.9
D2	Land Treatment	65,901	0.9	7,251	3.3	73,152	0.9
D4	Impoundment	78,163	1.0	14	0.0	78,177	1.0
D5	Specially engineered landfill		0.0	62	0.0	62	0.0
D6	Biological Treatment	66,578	0.9	9,979	4.5	76,557	1.0
D7	Physico-chemical Treatment	5,890	0.1	4,772	2.2	10,662	0.1
D8	Incineration	3,591	0.0	54,055	24.6	57,646	0.7
D9	Permanent Storage	585	0.0	4	0.0	589	0.0
D10	Release into a waterbody	131,025	1.7	224	0.1	131,249	1.7
D11	Blending prior to other disposal		0.0	35	0.0	35	0.0
D13	Storage prior to disposal	4,846	0.1	20	0.0	4,866	0.1
	Disposal total	**5,662,010**	**74.1**	**109,156**	**49.6**	**5,771,166**	**73.4**
R0	Reuse	382,471	5.0	6,288	2.9	388,759	10.6
R1	Solvent Reclamation	992	0.0	83,453	37.9	84,445	1.0
R2	Recovery of organic materials	645,347	7.9	7,217	3.3	652,564	7.8
R3	Reclamation of metals	31,014	0.4	3,252	1.5	34,266	0.4
R4	Recovery of inorganic materials	27,952	0.3	112	0.1	28,064	0.3
R5	Regeneration of acids or bases		0.0	175	0.1	175	0.0
R7	Recovery of components from catalysts	47	0.0	159	0.1	206	0.0
R8	Oil recovery	379	0.0	2,780	1.3	3,159	0.0
R9	Use as a fuel	81,688	1.0	6,420	2.9	88,108	1.0
R10	Landspreading	798,756	9.8	12	0.0	798,768	9.5
R13	Storage prior to recovery	8,764	0.1	834	0.4	9,598	0.1
	Recovery total	**1,977,409**	**25.9**	**110,702**	**50.3**	**2,088,111**	**26.6**
U	**Unspecified**	**47**	**0.0**	**115**	**0.1**	**162**	**0.0**
	TOTAL	**7,639,465**	**100.0**	**219,974**	**100.0**	**7,859,439**	**100.0**

Table 3.16: Disposal/Recovery Practices in Each Industrial Sector Surveyed

SECTOR	NACE code	DISPOSAL		RECOVERY		OTHER	
		(tonnes/ annum)	(%)	(tonnes/ annum)	(%)	(tonnes/ annum)	(%)
MINING							
Mining (excludes quarrying)	**C**	**3,498,083**	**99.6**	**13,560**	**0.4**		
MANUFACTURING							
Food Products; Beverages and Tobacco	DA	188,085	11.5	1,449,218	88.5	0	0.0
Textiles and Textile Products	DB	68,636	82.6	14,442	17.4	5	0.0
Leather and Leather Products	DC	7,454	35.4	13,603	64.6		0.0
Wood and Wood Products	DD	22,882	9.4	221,377	90.6		
Pulp, Paper and Paper Products; Printing and Publishing	DE	5,212	26.7	14,287	73.3		
Coke, Refined Petroleum Products and Nuclear Fuel	DF	22,598	77.2	6,676	22.8		
Chemicals, Chemical Products and Man-Made Fibres	DG	1,320,233	88.1	178,757	11.9	70	0.0
Rubber and Plastic Products	DH	9,535	54.0	8,123	46.0		
Other Non-Metallic Mineral Products	DI	204,405	96.0	8,482	4.0		
Basic Metals and Fabricated Metal Products	DJ	19,667	22.7	67,023	77.2	86	0.1
Machinery and Equipment not elsewhere classified.	DK	1,253	33.5	2,491	66.5		
Electrical and Optical Equipment	DL	14,915	62.8	8,829	37.2	1	0.0
Transport Equipment	DM	5,903	81.5	1,341	18.5		
Manufacturing not elsewhere classified.	DN	4,552	36.2	8,017	63.8		
SUB-TOTAL MANUFACTURING		**1,895,328**	**48.6**	**2,002,667**	**51.4**	**161**	**0.0**
ELECTRICITY, GAS & WATER SUPPLY							
Electricity, Gas and Water Supply	**E**	**377,757**	**84.0**	**71,883**	**16.0**		
TOTAL		**5,771,168**	**73.4**	**2,088,111**	**26.6**	**161**	**0.0**

Figure 3.9 illustrates disposal and recovery rates for mining, manufacturing and electricity, gas and water supply sectors. It is notable that while the overall industrial recovery rate is estimated to be 26.6% for 1998, the recovery rate for the manufacturing sector is considerably higher at 51.4%. The equivalent recovery rate reported by the manufacturing sector in 1995 was 31%.

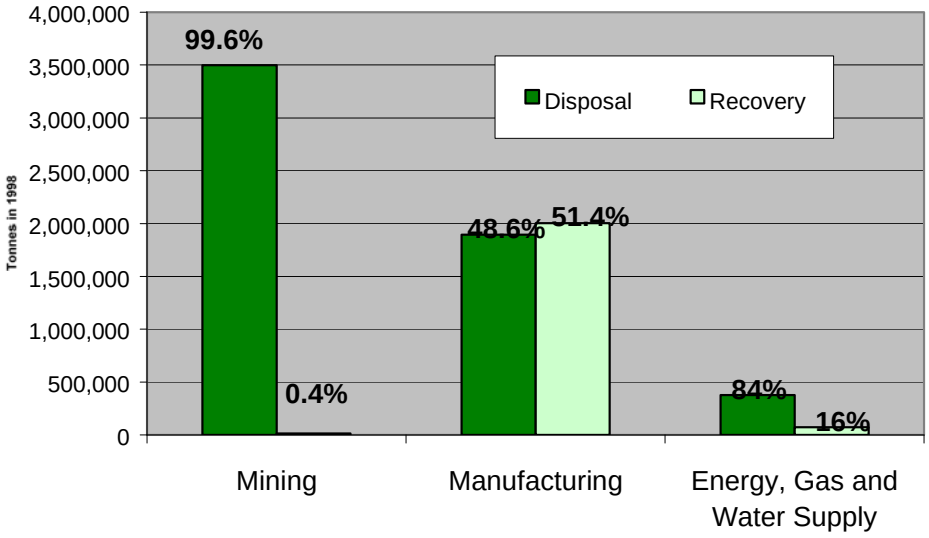


Figure 3.9: Disposal and Recovery Rates for Mining, Manufacturing and Energy, Gas & Water Supply Sectors in 1998

It is also notable that the majority of recovery is achieved in the Food Products; Beverages and Tobacco and Wood and Wood Products sectors where the wastes are recoverable through landspreading or reuse of the material in secondary materials such as fibre or chip boards. The percentages of disposal are especially high for the mining and non-metallic minerals production sectors. The high disposal rate for the chemicals, chemical products and man-made fibres sector results from the large quantities of waste landfilled by a single company, Aughinish Alumina, who reported over 1 million tonnes of waste landfilled in 1998. When this facility is discounted the recovery rate for this sector would be 39.5%.

A detailed breakdown of disposal/recovery practices for each sector is provided in Appendix B1.

3.4 PACKAGING WASTE

3.4.1 DEFINITION

Packaging is defined in Section 5 of the Waste Management Act, 1996 as *"any material, container or wrapping, used for or in connection with the containment, transport, handling, protection, promotion, marketing or sale of any product or substance, including such packaging as may be prescribed."*

The EU Directive 94/62/EC on packaging imposes targets for recovery and recycling of packaging waste on Ireland and its European Community partners. The target set for Ireland for June 30, 2001 is 25% recovery of packaging waste. By December 31, 2005, 50-65% (by weight) of packaging waste is to be recovered with 25 - 45% (by weight) of the total amount of packaging materials contained in packaging waste to be recycled (a minimum of 15% (by weight) for each packaging material). The Directive establishes that Member States must take the necessary steps to have return, collection and recovery systems set up so as that the targets set by the Directive can be met.

In 1997, the Waste Management (Packaging) Regulations were introduced which impose producer responsibility obligations on all producers of packaging. While all producers are made responsible for the packaging they produce, more stringent obligations are placed on Major Producers, which are defined as producers that place more than 25 tonnes of packaging on the Irish market per annum and have an annual turnover of greater than £1 million. Major producers must either comply with specific obligations set out in the Regulations or participate in an approved waste recovery scheme. To date, one approved scheme, REPAK, has been established. REPAK was set up as a result of an industry-led initiative to meet the targets set by the Packaging Directive on a voluntary basis.

3.4.2 AMOUNTS ARISING & WASTE COMPOSITION

The best estimate for packaging waste arisings in 1998 is 682,688 tonnes (see Table 3.17). This consists of packaging waste from the household and commercial waste stream landfilled, packaging waste reported to be recovered and packaging waste reported by industry considered unreported under the other headings. The quantity of packaging waste in the household and commercial waste stream is now estimated to be 675,043 tonnes in comparison with 435,372 tonnes in 1995 and 403,995 in January 1994. This consists of 295,817 tonnes of packaging waste from the household waste stream consigned to landfill, 285,967 tonnes of packaging waste from the commercial waste stream consigned to landfill and 93,259 tonnes of packaging waste reported to be recovered by recycling organisations. In relation to the commercial waste stream, it is important to note that there is considerable overlap between waste reported as 'commercial' waste and waste reported as 'industrial' waste and it is therefore likely that a significant fraction of waste reported as 'commercial' actually originates from industrial sources.

These estimates are based on information obtained from National Waste Database surveys of local authorities, industries, waste contractors and recycling organisations and the results of waste composition surveys conducted on household and commercial waste streams. The increase in estimated packaging waste arisings, which, for the household and commercial waste stream is a 55% increase on 1995 figures, is a result of a number of factors, as follows:

- an increase in the total amount of commercial waste reported by local authorities to be landfilled (an increase from 403,729 tonnes in 1995 to 560,068 tonnes in 1998),
- an increase in the quantities of packaging waste reported to be recovered by recycling organisations (an increase from 67,967 tonnes in 1995 to 93,259 tonnes in 1998);
- an increase in the estimated packaging content of the commercial waste stream consigned to landfill (33.3% in 1995 to 51.1% in 1998), based on the results of commercial waste composition surveys; and,
- an increase in the estimated packaging content of the household waste stream consigned to landfill (23.7% in 1995 to 26.3% in 1998), based on the results of household waste composition surveys.

Table 3.17: Estimated Packaging Waste Arisings in Ireland in 1998 (tonnes)

WASTE TYPE	BEST ESTIMATE
Paper	300,174
Glass	111,417
Plastic	168,834
Ferrous	27,472
Aluminium	11,780
Other Metals	1,879
Textiles	4,568
Others	56,564
TOTAL	**682,688**

3.4.3 DISPOSAL/RECOVERY ROUTES

Tables 3.18 to 3.21 provide a summary of disposal and recovery routes for different packaging materials that arose in the waste stream in Ireland in 1998. Information is provided on gross quantities available, gross quantities recovered and disposed of and the relative rates of recovery and disposal in the household waste stream (Table 3.18), the commercial waste stream (Table 3.19), the combined household and commercial waste stream (Table 3.20) and the total waste stream, which includes packaging waste reported by industry considered unreported under the other headings (Table 3.21). The principal disposal route is landfill while recovery routes tend to be material dependent. However, the recovery industry in Ireland consists of a relatively small number of players with the bulk of paper recovery and glass recovery, for instance, handled by single companies.

The best estimate for recovery of packaging waste in 1998 is 14.8% which suggests that Ireland has considerable progress to make if it is to meet the target of 25% set by the Packaging Directive for 2001. Recovery rates achieved to date, together with the targets required by the Directive, are illustrated in Figure

3.10. If the total quantity of packaging waste arising remains at the current level of 682,688 tonnes, to meet the target of 25% recovery will require that total tonnage's recovered increase to 170,672 tonnes per annum, compared with a current estimated tonnage recovered of 100,905 tonnes.

For packaging materials in the combined household and commercial waste stream, the recovery rate is estimated to be 13.8% with the remainder consigned to landfill. This compares with a recovery rate for household and commercial waste of 15.6% in 1995, the reduction due to increased quantities reported to be disposed of at landfill. Recovery of packaging waste from the household waste stream, with the exception of glass, is poor, with the overall rate at 5.6%. This compares with an overall rate for the commercial waste stream of 21.0%. However, in relation to the 'commercial' waste stream, it should be noted that a significant proportion of arisings reported under the heading 'commercial' appears to be packaging waste produced by the industrial sector. The recovery rate for packaging waste reported by the industrial sector was 52% (38,547 tonnes recovered out of total reported arisings of 74,414 tonnes). There is clearly a need for further work to define more precisely the origin of non-household packaging waste.

Paper and glass recovery account for 80% of the total estimated quantity recovered. Recovery activity for plastics, ferrous and aluminium remains relatively low while the main packaging components in the 'other' category are wood packaging, composite packaging and mixed packaging. Recovery activity for wood packaging is relatively high while composite packaging and mixed packaging is predominantly disposed of to landfill.

Table 3.18: Disposal and Recovery Rates for Packaging Materials in the Household Waste Stream in Ireland

Material	Quantity Disposed (tonnes/annum)	Quantity Recovered (tonnes/annum)	Gross Quantity Available (tonnes/annum)	% Landfilled (%)	% Recovered (%)
Paper	58,162	1,632	59,794	97.3	2.7
Glass	59,457	14,100	73,557	80.8	19.2
Plastic	116,775	648	117,423	99.4	0.6
Ferrous	21,201	560	21,760	97.4	2.6
Aluminium	8,160	480	8,640	94.4	5.6
Other Metals	330	0	330	100.0	0.0
Textiles	3,187	0	3,187	100.0	0.0
Other	28,545	0	28,545	100.0	0.0
Total	**295,817**	**17,419**	**313,236**	**94.4**	**5.6**

Table 3.19: Disposal and Recovery Rates for Packaging Materials in Commercial Waste Stream in Ireland

Material	Quantity Disposed (tonnes/annum)	Quantity Recovered (tonnes/annum)	Gross Quantity Available (tonnes/annum)	% Landfilled (%)	% Recovered (%)
Paper	197,358	40,630	237,988	82.9	17.1
Glass	15,960	21,900	37,860	42.2	57.8
Plastic	47,657	2,810	50,467	94.4	5.6
Ferrous	5,157	485	5,642	91.4	8.6
Aluminium	3,140	0	3,140	100.0	0.0
Other Metals	0	15	15	0.2	99.8
Textiles	1,381	0	1,381	100.0	0.0
Other	15,314	10,000	25,314	60.5	39.5
Total	**285,967**	**75,840**	**361,807**	**79.0**	**21.0**

Table 3.20: Disposal and Recovery Rates for Packaging Materials in the Household and Commercial Waste Stream in Ireland

Material	Quantity Disposed (tonnes/annum)	Quantity Recovered (tonnes/annum)	Gross Quantity Available (tonnes/annum)	% Landfilled (%)	% Recovered (%)
Paper	255,520	42,262	297,782	85.8	14.2
Glass	75,417	36,000	111,417	67.7	32.3
Plastic	164,432	3,458	167,890	97.9	2.1
Ferrous	26,357	1,045	27,402	96.2	3.8
Aluminium	11,300	480	11,780	95.9	4.1
Other Metals	330	15	345	95.7	4.3
Textiles	4,568	0	4,568	100.0	0.0
Other	43,859	10,000	53,859	81.4	18.6
Total	**581,784**	**93,259**	**675,043**	**86.2**	**13.8**

Table 3.21: Best Estimate of Recovery Rates for Packaging Materials in the Total Waste Stream in Ireland

Material	Quantity Arising (tonnes/annum)	Quantity Recovered (tonnes/annum)	Recovery Rate (%)
Paper	300,174	44,654	14.9
Glass	111,417	36,000	32.3
Plastic	168,834	4,402	2.6
Ferrous	27,472	1,115	4.1
Aluminium	11,780	480	4.1
Other Metals	1,879	1,548	82.4
Textiles	4,568	0	0.0
Other	56,564	12,705	22.5
Total	**682,688**	**100,905**	**14.8**

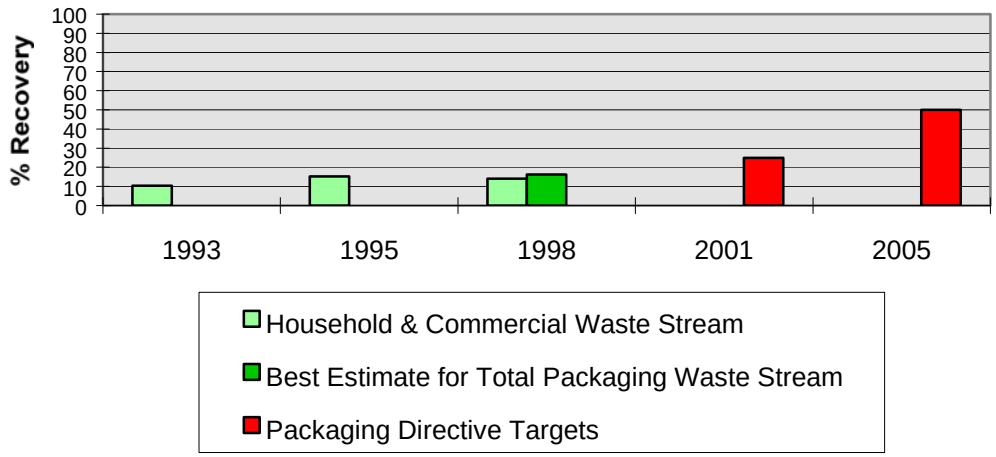


Figure 3.10: Recovery Rates for Packaging Materials in Waste Stream: 1993 - 1998

3.5 HAZARDOUS WASTE

The Proposed National Hazardous Waste Management Plan (NHWMP), which was published in September 1999, considerably improved the quality of information on hazardous waste. The proposed NHWMP provided estimates of hazardous waste arisings and disposal and recovery rates for the year 1996. The

information presented here for 1998 has been collected from the industrial survey, hazardous waste brokerage firms and other sources and is presented in the same format as used in the proposed plan.

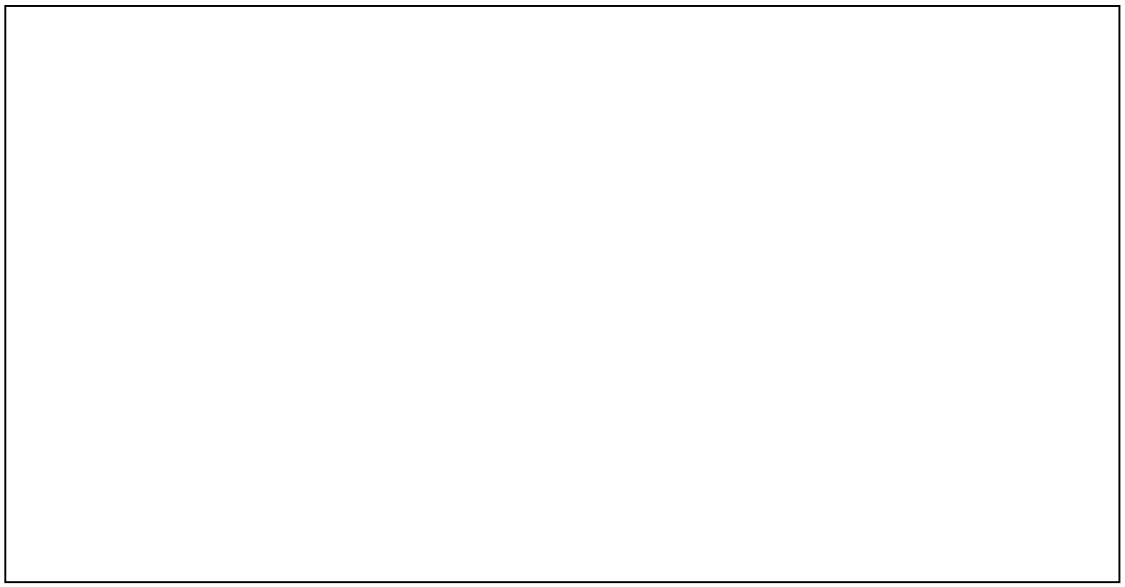
3.5.1 AMOUNTS ARISING AND WASTE COMPOSITION

Best estimates of hazardous waste arisings in 1998 are presented according to material type in Table 3.22 in the same format as that used in Table 3.6 of the proposed plan. This information is an update of the data in the proposed NHWMP, with the exception of the figure for pesticide waste arising for which no updated figure was available, and provides a best estimate of hazardous waste arisings for 1998.

Hazardous waste arisings in 1998 are estimated to be 370,328 tonnes, compared with 327,862 tonnes in 1996, an increase of 13.0%. However, this increase can be partially attributed to higher arisings of contaminated soils in 1998, which relate almost entirely to one site in Cork City. This one site gave rise to 23,795 tonnes of hazardous waste in 1998. When this is discounted from the 1998 total, the increase in hazardous waste arisings is about 5.7% over the two-year period. While the overall increase is relatively modest, certain waste streams have shown large changes. Most notable of these is the increase in organic solvent arisings which have increased by 37% since 1996. This increase is most likely related to better reporting of wastes with a corresponding decrease in other pharmaceutical waste. PCB waste arising has increased from 71.1 tonnes in 1996 to 190 tonnes in 1998. Spent sheep dip arisings were estimated to be 19,000 tonnes in 1998 compared to 28,000 tonnes in 1996. Increasing use of pour-on products which do not give rise to spent sheep dip is reported to be a major factor in this reduction (pers comm APHA).

Table 3.22 lists hazardous waste categorised by waste type, quantities and destination. In generating the table, a correlation was drawn between certain EWC codes and certain general waste types. Where respondents considered wastes to be hazardous but did not assign them a HWL code, the records were reviewed and, where considered appropriate, included as hazardous waste.

Some amendments of the waste descriptions used in the corresponding table in the proposed NHWMP were required. The category '*washing liquids*' was amended to '*washing liquids and mother liquor*' and a new category '*hazardous thermal treatment residues*' was added. This waste stream gave rise to 828 tonnes in 1998. Other amendments include the amalgamation of '*lead bearing tin ashes*' and '*lead dross*' together with some other metallurgical wastes in the category *'Dross from metallurgy'*.



Photograph 1 : A Hazardous Waste Storage Unit

Table 3.22: Hazardous Wastes and Destinations in 1998 categorised by Waste Type

Total Reported quantity - location of recovery or disposal (tonnes)							
Hazardous Waste Type	**On Site**	**Off Site**	**Exported**	**Unspecified**	**Subtotal**	**Unreported**	**Total Generated**
Organic halogenated solvents	3,669	12	3,248	0	6,929	68	6,997
Non halogenated organic solvents	67,060	27	44,434	0	111,520	0	111,520
Other organic solvents	576	65	571	0	1,213	0	1,213
Other pharmaceutical waste (mixed)	103	14	1,557	0	1,675	0	1,675
Oily sludges	6,444	9,960	230	0	16,634	2,429	19,063
Spent sheep dip	0	0	0	0	0	19,000	19,000
Waste oils	747	14,187	131	26	15,091	2,255	17,346
Saltcake/salts	28,111	0	10	0	28,121	0	28,121
Lead acid batteries	7	3,350	1,818	0	5,175	9,038	14,213
Filter cakes and metal containing sludges	42	542	2,545	0	3,129	0	3,129
Washing liquids and mother liquors	19,044	3,860	10,391	335	33,630	0	33,630
Household hazardous waste	0	0	0	0	0	6,831	6,831
Still bottoms and reaction residues	4,126	346	324	0	4,795	0	4,795
Clinical waste	0	3	3,326	0	3,329	330	3,659
Metal hydroxide sludges/ion exchange resins	46	1,755	86	0	1,887	0	1,887
Small batteries	0	18	0	0	18	2,914	2,932
Oil filters	6	349	13	40	408	919	1,327
Paint/ink/varnish sludges	12	246	271	0	529	0	529
Acid/alkali waste	6	5,282	623	0	5,911	0	5,911
Paint/ink/varnish liquid waste	1,657	167	570	0	2,393	0	2,393
Photographic waste	0	3	34	0	37	1,572	1,609
General office waste	0	0	0	0	0	152	152
Dross from lead metallurgy	0	48	1,304	0	1,352	0	1,352
Veterinary medicine	0	0	0	0	0	483	483
Fluorescent tubes	0	27	3	0	30	524	554
Contaminated soil	0	0	23,691	21,795	45,486	0	45,486
Pesticides (agricultural)	0	0	0	0	0	340	340
Asbestos waste	1	0	1,334	0	1,335	0	1,335
Spent filters	0	0	56	0	56	0	56
Adhesive waste	29	127	162	0	318	0	318
Zinc oxide	0	20	225	0	245	0	245
Mercury containing wastes	0	0	535	0	536	0	536
PCB waste	0	0	190	0	190	0	190
Waxes/fats	0	114	141	0	255	0	255
Gold solutions	0	0	4	0	4	0	4
Waste catalysts	0	0	245	0	245	0	245
Paint and ink packaging	0	0	0	0	0	7,764	7,764
Hazardous thermal treatment residues	11	496	320	0	828	0	828
Other hazardous wastes	43	1,465	1,205	0	2,713	19,693	22,406
TOTALS	**131,738**	**42,485**	**99,598**	**22,196**	**296,017**	**74,311**	**370,328**

3.5.2 GEOGRAPHICAL DISTRIBUTION OF INDUSTRIAL HAZARDOUS WASTE ARISINGS

Table 3.23 presents a county by county breakdown of reported industrial hazardous waste arisings in 1998. Information is presented in a similar format to that used in Table 3.4 of the proposed NHWMP. Differences arise due to the fact that the 1996 data was partially based on the final destination of wastes whereas the 1998 data specifically relates to the geographical location at which the waste arose.

Industrial hazardous waste was reported to have arisen in all counties. By far the greatest quantity arises in Cork (62.3%), reflecting the presence of the pharmaceutical and chemical sector in the county, with Cork, Limerick and Dublin accounting for 83.8% of the total quantity reported. A single company, Aughinish Alumina, is responsible for the bulk of hazardous waste arisings in Limerick.

Table 3.23: Geographical Location of Reported Industrial Hazardous Waste in 1998

County	Quantity (tonnes)
Cork	137,102
Limerick	28,763
Dublin City	18,536
Tipperary	6,185
Wicklow	4,210
Kilkenny	4,109
Laois	3,399
Kildare	3,386
Clare	2,497
Kerry	2,338
Louth	1,756
Roscommon	1,490
Meath	1,412
Waterford	1,202
Galway	833
Mayo	754
Monaghan	322
Offaly	277
Leitrim	250
Cavan	221
Sligo	211
Westmeath	206
Longford	173
Wexford	159
Donegal	148
Carlow	36
TOTAL	**219,974**

3.5.3 DISPOSAL AND RECOVERY ROUTES FOR HAZARDOUS WASTE

Information on disposal and recovery routes for hazardous waste is presented in Table 3.24. This corresponds to Table 3.5 in the proposed NHWMP. A total of 35.6% of hazardous waste was disposed of or recovered on-site, 11.5% was recovered or disposed of off-site in Ireland while 26.9% was exported. The remaining 26.1% consists of waste where the disposal recovery methodology was not specified (6%) and unreported waste (20.1%). The total quantity reported as disposed was 120,354 tonnes with 152,583 tonnes reported recovered. The two main disposal routes were incineration and landfill that accounted for 17.7% and 9.2% respectively. The main recovery route was solvent recovery, which accounted for 22.2% of hazardous waste arising.

Table 3.24: Summary of disposal and recovery routes and locations for hazardous waste in 1998 (tonnes)

	Route	On Site	Off Site	Export	Unspecified	Unreported	Total	
D1	Landfill	28,499	3,430	2,037	0	0	33,966	9.2%
D2	Land Treatment	100	7,151	0	0	0	7,251	2.0%
D3	Injection	0	0	0	0	0	0	0.0%
D4	Surface Impoundment	0	0	0	0	0	0	0.0%
D5	Specially Engineered Landfill	0	0	0	0	0	0	0.0%
D6	Biological Treatment	8,304	1,141	0	335	0	9,780	2.6%
D7	Physico Chemical Treatment	1,505	1,547	92	0	0	3,144	0.8%
D8	Incineration	17,880	0	47,751	0	0	65,631	17.7%
D9	Permanent Storage	0	4	0	0	0	4	0.0%
D10	Release to a water body	0	224	0	0	0	224	0.1%
D11	Blending prior to disposal	0	35	0	0	0	35	0.0%
D12	repackaging prior to disposal	0	0	0	0	0	0	0.0%
D13	Storage prior to disposal	10	9	0	0	0	19	0.0%
DU	Unspecified Disposal	0	0	300	0	0	300	0.1%
Total Disposal		**56,298**	**13,541**	**50,180**	**335**	**0**	**120,354**	**32.5%**
R0	Re Use	6,018	269	0	0	0	6,287	1.7%
R1	Solvent Recovery	65,988	148	15,875	24	0	82,035	22.2%
R2	Recovery of organic substances	14	280	2,584	0	0	2,878	0.8%
R3	Metal Recovery	1	4,085	2,503	0	0	6,589	1.8%
R4	Recovery of inorganic substances	0	0	23795	0	0	23,795	6.4%
R5	Engineered Landfill	0	175	0	0	0	175	0.0%
R6	Recovery of pollution abatement components	0	0	100	0	0	100	0.0%
R7	recovery of components from catalysts	0	0	0	0	0	0	0.0%
R8	Oil Recovery	709	23,776	352	41	0	24,878	6.7%
R9	Use as a fuel	2,708	127	1,947	0	0	4,782	1.3%
R10	Landspreading	0	8	0	0	0	8	0.0%
R11	Recovery from any of above	0	0	0	0	0	0	0.0%
R12	waste exchange	0	0	0	0	0	0	0.0%
R13	Storage prior to recovery	2	0	84	0	0	86	0.0%
RU	Unspecified Recovery	0	0	970	0	0	970	0.3%
Total Recovery		**75,440**	**28,868**	**48,210**	**65**	**0**	**152,583**	**41.2%**
U		**0**	**76**	**1,208**	**21,795**	**74,311**	**97,390**	**26.9%**
TOTAL		**131,738**	**42,485**	**99,598**	**22,196**	**74,311**	**370,328**	**100.0%**
		35.6%	**11.5%**	**26.9%**	**6.0%**	**20.1%**		

3.5.4 DESTINATION AND FATE OF EXPORTED HAZARDOUS WASTE

The destination and fate of hazardous waste exported from Ireland in 1998 is summarised in Table 3.25. In 1998, it was estimated that 99,598 tonnes of hazardous waste were exported. This compares with 51,727 tonnes in 1996, an increase of 92.5% in two years. This increase can partially be attributed to the once-off export of 23,795 tonnes of contaminated soils from Cork City in 1998. However, even with this once-off export discounted, it is clear that there has been a very significant increase in the quantity of hazardous waste exported from Ireland.

While data on all of the exported hazardous waste is not available, a survey of waste brokers provided destination and disposal/recovery information for 99% of the exported material (98,393 tonnes). Of the tonnage exported via brokers, 51% was reported disposed with 49% recovered.

There has been a significant shift in the final destination of hazardous wastes exported from Ireland. In 1998, the United Kingdom received 34.8% of waste exported from Ireland. This compares with 85% for 1996. The reduction in quantities exported to the United Kingdom is mirrored by an increase in the quantities received by Mainland Europe, with the main emerging destinations being Holland, which accepted 30.7% in 1998, Germany which accepted 13.4% and Belgium which accepted 10.7%.

Incineration is the favored disposal methodology for exported hazardous waste with 95.2% of waste exported for disposal incinerated and the bulk of the remaining 4.8% landfilled. The principal recovery routes were recovery of organic materials and solvent recovery.

Table 3.25: Destination and Fate of Hazardous Waste Exported by Brokers in 1998 (tonnes)

			DISPOSAL				RECOVERY				
Country	**Total exports**	**%**	**Thermal Treatment**	**Landfill**	**Other**	**Total**	**Recovery of organic material**	**Solvent Recovery**	**Metal Recovery**	**Other**	**Total**
UK	**34,188**	**34.8**	9,773	0	392	**10,165**	0	15,875	2,404	5,744	**24,023**
Holland	**30,162**	**30.7**	6,367	0	0	**6,367**	23,795	0	0	0	**23,795**
Germany	**13,192**	**13.4**	11,154	2,037	0	**13,192**	0	0	0	0	**0**
Belgium	**10,554**	**10.7**	10,381	0	0	**10,381**	0	0	72	100	**173**
Denmark	**8,820**	**9.0**	8,714	0	0	**8,714**	0	0	0	106	**106**
Finland	**1,362**	**1.4**	1,362	0	0	**1,362**	0	0	0	0	**0**
USA	**88**	**0.1**	0	0	0	**0**	0	0	0	88	**88**
France	**27**	**0.0**	0	0	0	**0**	0	0	27	0	**27**
Totals	**98,393**	**100.0**	**47,752**	**2,037**	**392**	**50,181**	**23,795**	**15,875**	**2,503**	**6,038**	**48,212**

3.6 AGRICULTURAL WASTE

3.6.1 DEFINITION

Wastes arising from agriculture consist mainly of organic wastes and other waste types. Organic wastes refers to all types of animal excreta, i.e. faeces and urine from cattle, sheep, pigs, poultry etc., in the form of slurries and farmyard manures. It also includes silage effluent, soiled water and spent mushroom compost. Other wastes arising on farms include household waste, plastic, fencing, scrap machinery, waste oil, pesticides and veterinary medicines. Soiled water refers to liquids that arise from a variety of farmyard sources, such as overland flow from open concrete yards, effluents from dungsteads and farmyard manure pits and washings from milking premises, dairies and collecting yards.

3.6.2 AMOUNTS ARISING AND WASTE COMPOSITION

The estimation of agricultural waste arisings is based on animal numbers, average waste production per animal and the length of time that animals are kept indoors. The manner with which this calculation is conducted changes periodically which makes it difficult to assess trends in waste production. The most reliable indicator for agricultural waste production is therefore animal numbers. In the 1990s, there has been growth in numbers of all animal types with the exception of sheep for which there was a drop in numbers of about 6%; however, this followed a doubling in numbers during the nineteen eighties. Between 1991 and 1998, cattle, pigs and poultry numbers have increased by 13%, 39% and 9%, respectively.

Estimated agricultural waste arisings in Ireland are presented in Table 3.26. The last full census of agriculture was undertaken in June 1991. However, to obtain a more up to-date picture of the quantities arising, the Agency used the livestock numbers for 1998 detailed in the *Statistical release - Crop and Livestock Survey, June 1998* (CSO 1998). The annual crop and livestock surveys are based on returns from 15,900 farms which are selected to be representative of the total number of farms in Ireland.

Various sources of information were used to calculate the amount of waste generated by each category of livestock. The Department of Agriculture and Food (DAF) and Teagasc provided useful information and figures particularly in relation to the pig and poultry sectors. Average housing periods of 20, 6 and 26 weeks were used for cattle, sheep and horses respectively. For pigs and poultry it was assumed that all the slurries or litter produced are collected and require management. The quantity of silage effluent arising is calculated from information supplied by Teagasc on the amount of grass dry matter harvested on an annual basis.

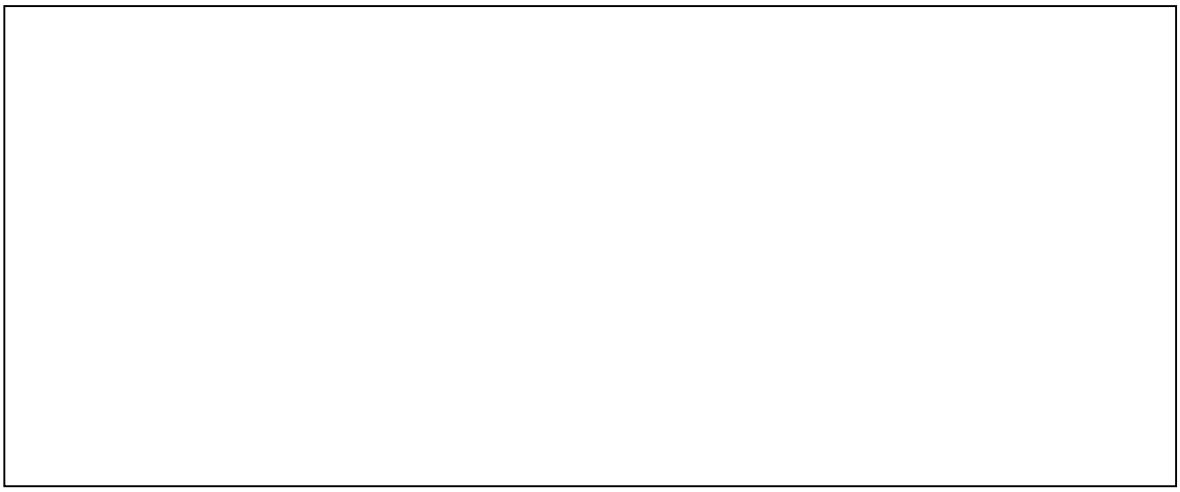
Table 3.26: Total Estimated Agricultural Waste Arisings in Ireland in 1998

Waste Category	Quantities Arising	
	(tonnes/annum)	(%)
Cattle manure and slurry	37,098,470	57.4
Sheep manure	338,063	0.5
Horse manure	365,310	0.6
Pig manure and slurry	2,623,350	4.1
Poultry manure	1,847,531	2.9
Silage effluent	2,684,500	4.2
Dirty Water (dairy only)	19,621,500	30.4
TOTAL	**64,578,724**	**100.0**

For 1998, it is estimated that approximately 64.6 million tonnes of agricultural waste requiring management arose in Ireland. The vast majority of this is animal manures with almost 20 million tonnes dirty water from the dairy sector. Table 3.26 does not include other agricultural wastes such as farm plastics, waste oils and spent sheep dip which are accounted for elsewhere in the figures such as household waste, recycled waste and hazardous waste. Waste oils and spent sheep dip are accounted for under the section on hazardous waste. Farm plastics for the purpose of this report has been included under the heading *commercial waste*.

3.6.3 DISPOSAL/RECOVERY ROUTES

Almost all organic agricultural waste arising in Ireland is spread on agricultural land. Whether landspreading of organic waste should be considered to be disposal or recovery depends on a number of factors including the conditions under which the waste is spread, the timing of application, the soil type and general condition of the land and the nutrient requirements of grass, cereals or field crops to be grown on the land.



Photograph 2: Cattle Grazing near Lough Derg

3.7 URBAN WASTEWATER SLUDGES AND OTHER ORGANIC SLUDGES

3.7.1 DEFINITIONS

URBAN WASTEWATER SLUDGES

The Environmental Protection Agency Act, 1992, (Urban Waste Water Treatment) Regulations, 1994, (S.I. 419 of 1994) transposed into Irish law the provisions of EU Council Directive 91/271/EEC concerning urban waste water treatment. The Regulations require the provision of waste water treatment plants depending on the size of the agglomeration and on the type of water body to which the waste water is discharged.

The Waste Management (Use of Sewage Sludge in Agriculture) Regulations, (S.I. No. 148 of 1998) replaced without substantive amendment, the European Communities (Use of Sewage Sludge in Agriculture) Regulations, 1991, S.I. 183 of 1991. The Regulations implement the requirements of Council Directive 86/278/EEC on the protection of the environment, and in particular the soil, when sewage sludge is used in agriculture.

Sludge is defined in the above Regulations as:

(i) Residual sludge from sewage plants treating domestic or urban waste waters and from other sewage plants treating waste waters of a composition similar to domestic and urban waste waters;
(ii) Residual sludge from septic tanks and other similar installations for the treatment of sewage;
(iii) Residual sludge from sewage treatment plants other that those referred to in (i) and (ii) above.

OTHER SLUDGES

Other organic sludges include industrial biological sludges from industrial wastewater treatment, organic sludges from the food industry and abattoir wastes. Information on other organic sludges was obtained from the Inventory of Non-Hazardous Sludges in Ireland (Fehily Timony, 1998) and from the Industry survey.

3.7.2 AMOUNTS ARISING AND RECOVERY/DISPOSAL ROUTES

URBAN WASTEWATER SLUDGES

Under the Urban Waste Water Treatment Regulations, Sanitary Authorities are required to submit monitoring data on urban waste water treatment plants to the EPA on an annual basis. The EPA publishes a biennial report on Urban Waste Water Treatment Discharges and the recovery and/or disposal routes of urban wastewater sludges from agglomerations with a population equivalent greater than or equal to 1,000.

In 1998, the total urban wastewater sludge arisings for agglomerations with a population equivalent greater than or equal to 1,000 was estimated to be 37,577 tonnes dry solids (TDS) (EPA, in prep.). Of this, 15.8% was disposed/re-used in agriculture, 41.4% was landfilled, 40.6% was dumped at sea and the remaining 2.2% treated by some other unspecified route. Assuming the sludge going for sea disposal was 4% solids and an average solids content of 20% for the remainder, 37,577 tonnes dry weight equates to approximately 493,011 tonnes wet weight (381,407 tonnes at 4% solids disposed at sea and 111,604 tonnes at 20% solids disposed or recovered on land). Wet weight quantities disposed or recovered in 1998 are therefore estimated to be: 29,686 tonnes wet weight disposed/reused in agriculture, 77,785 tonnes wet weight landfilled and 381,407 tonnes wet weight disposed at sea. The disposal/ recovery routes for the remaining 2.2% (4,133 tonnes) are unknown.

The Urban Waste Water Treatment Directive (91/271/EEC) required the dumping of sewage sludge at sea to cease by the end of 1998 and required that sewage sludge shall be reused whenever appropriate. The ban on ocean disposal was enacted in Ireland through the Dumping at Sea Act, 1996. One permit was issued in 1998 for the disposal of sewage sludge at sea to Dublin Corporation for 410,000 tonnes. Dumping at sea of sludges from the Dublin Corporation wastewater treatment works at Ringsend ceased in 1999.

The most recent EPA report (1998) indicates that the quantities of sewage sludge arisings will increase dramatically when secondary treatment facilities are in place in Dublin, Cork, Dundalk, Limerick and Galway. However, while dry weight figures will rise, an initial drop in total wet weight figures can be

expected because sludge produced in the Ringsend plant in Dublin which, up to now, has been dumped at sea, is now being dried and converted into a pellet form for use on land. For instance, if all sludges produced in the State were dried to between 15 and 20% solids, the total wet weight in 1998 would be between 187,885 tonnes and 250,513 tonnes.

In addition to sludges from urban wastewater treatment plants, there is also a significant quantity of sludge arising from small-scale wastewater treatment plants and septic tanks. It is estimated that in the region of 507 TDS of sludge arises from these sources per annum (Fehily Timony, 1998). Assuming an average solids content of 4%, this equates to approximately 12,675 tonnes wet weight, the majority of which is disposed of to landfill, bringing the total estimated wet weight arisings for sewage sludges in 1998 to 505,686 tonnes.

OTHER SLUDGES

Table 3.27 provides a summary of reported quantities of sludge from industrial biological wastewater treatment, the food industry and abattoirs reported in the Inventory of Non-Hazardous Sludges in Ireland (Fehily Timony, 1998).

Table 3. 27: Summary of Reported Biological Sludge Arisings from Industrial Sources

Sludge Type	Dry Weight (TDS)
Industrial biological wastewater sludges	57,446
Food Industry sludges	88,851
Abattoir (excluding offal) sludges	19,369
Total	**165,666**

Information on similar sludges for 1998 was abstracted from the Industry survey. Reported sludges arising are presented in Table 3.28 categorised according to industry sector. In most cases industrial returns were provided as wet weight where the percent solids can vary from very low for sludges with little dewatering, meaning a relatively high volume of material requiring disposal or recovery, to relatively high, where significant dewatering has occurred. From a waste management perspective, the wet weight is of most importance as it reflects the actual weight of material to be treated as waste.

The sector producing the greatest quantity of sludges was the food and beverage sector, which gave rise to 94% of the total reported sludge arising. The chemical and pharmaceutical sector produced 20,000 tonnes of sludge (3% of the total). Of the total reported, 10% was reported to be disposed and 90% was reported to be recovered. The primary recovery route was landspreading, with 583,140 tonnes of waste from the food and beverages sector alone reported to be landspread.

Table 3.28: Reported Industrial Sludges (tonnes)

NACE Sector		Total	Landfill	Other Disposal	Land spreading	Other recovery	Unspecified
C	Mining and quarrying	**216**	200	16	0	0	0
DA	Food and beverages	**668,485**	7,948	31,194	583,140	46,013	0
DB	Textiles	**829**	409	420	0	0	0
DC	Leather	**8,788**	960	0	7,828	0	0
DD	Wood	**2,873**	2,842	0		31	0
DE	Paper, publishing & printing	**0**	0	0	0	0	0
DF	Coke, refined petroleum	**100**	0	100	0	0	0
DG	Chemical, pharmaceutical	**20,036**	13,441	5,036	20	1,539	0
DH	Rubber, plastics	**2**		2	0	0	0
DI	Non-metals	**5,804**	5,534	270	0	0	0
DJ	Metals, metal products	**618**	588	13	0	0	18
DL	Electrical, optical	**79**	3	55	0	20	0
DM	Transport equipment	**0**	0	0	0	0	0
DN	Manufacturing	**82**	73	0	0	9	0
E	Electricity, gas supply	**158**	91	55	12	0	0
	TOTALS	**708,070**	**32,088**	**37,162**	**591,000**	**47,612**	**18**

3.7.3 CONCLUSIONS

There is a considerable quantity of biological sludge produced in Ireland, both from the treatment of urban wastewater and from various industrial activities, mainly within the food and beverage sector. While only 15.8% of urban wastewater sludges were put to agricultural or horticultural use in 1998, it is likely that this quantity will rise significantly in 1999 and 2000 with the move away from sea disposal in Dublin. The expected growth in secondary treatment is also going to give rise to a significant increase in urban wastewater sludges over the coming years. When these increases are considered together with the relatively large quantities of biological sludges from industrial sources, a precautionary approach is required when considering application of these sludges to agricultural land.

3.8 CONSTRUCTION AND DEMOLITION WASTE (INCLUDING DREDGE SPOIL)

3.8.1 DEFINITION

Construction and demolition waste is taken to include all waste that arises from construction, renovation and demolition activities and all wastes mentioned in Chapter 17 of the European Waste Catalogue. This includes surplus and damaged products and materials arising at construction works or used temporarily during on-site activities (Priority Waste Stream Project Group 1995, Report to EU on Waste from Construction and Demolition), and dredge spoil.

Dredge spoil is described in *"Ireland's Marine and Coastal Areas and Adjacent Seas, An Environmental Assessment"* (Marine Institute 1999) as being made up of two primary types of dredging materials: maintenance and capital dredging. Maintenance dredging is conducted regularly in Irish ports for navigation purposes and this activity gives rise to predominantly erodible materials such as silt and sands. Capital dredging occurs when significant removal of seabed material is required during major engineering operations. Capital dredgings are generally bulky non-erodible materials such as rock and gravel.

Photograph 3: Housing Construction Site

3.8.2 WASTE ARISINGS AND DISPOSAL/RECOVERY ROUTES

As an industrial sector, the construction/demolition industry is one of the largest producers of waste in Ireland. In general, the operators dealing with this waste stream have not kept records of quantities or types arising. The most reliable information currently available on the waste stream is quantities reported to be landfilled. Given the high priority placed on construction and demolition waste in *'Changing Our Ways'*, the recent policy statement published by the Minister of the Environment & Local Government, particular attention needs to be paid to improving data on this waste stream so that achievement of the target recycling rates can be assessed. The target recycling rates for construction and demolition waste in the policy statement are at least 50% within a five year period , with a progressive increase to at least 85% over fifteen years.

The amount of construction and demolition waste reported to have been sent to landfill in 1998 is 2,704,958 tonnes. This includes a considerable quantity of material that would have been put to beneficial use on the landfill sites either as a construction material for the construction of roads and berms or as cover and capping material. While 2.7 million tonnes of construction and demolition waste is finding its way to landfills in Ireland, a considerable fraction of this is therefore being recovered. Based on information reported to the Agency, it is estimated that 1,171,572 tonnes of waste going to landfill was recovered in 1998, consisting of construction and demolition waste reported to be received at Dunsink (931,572 tonnes) in Fingal and Kinsale Road (240,000 tonnes) in Cork City. This means that an estimated 43.3% of waste going to landfill is being recovered.

The estimated composition of construction and demolition waste is illustrated in Figure 3.11. As can be seen, the two major categories are soil and stones, which account for an estimated 51.1% of the total, and concrete, bricks, ceramics, and gypsum-based materials, which account for 37.9% of the total. This analysis is based on a single survey conducted in 1996. It should be stressed that there is a need for further compositional surveys of construction and demolition waste so that more comprehensive information is available about the composition of the waste stream.

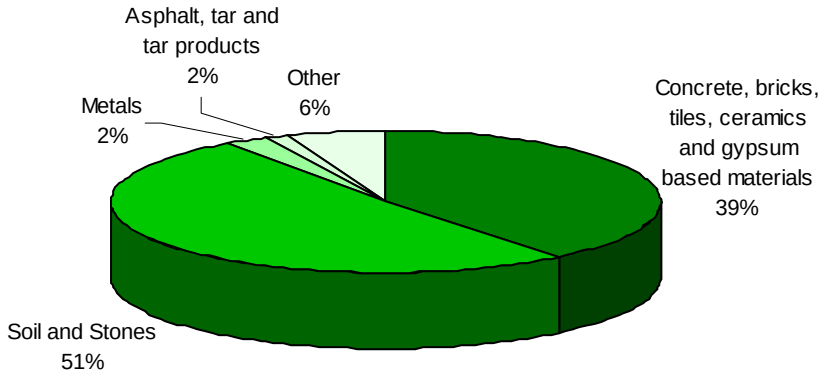


Figure 3.11: Estimated Composition of Construction & Demolition Waste in Ireland

The amount of construction and demolition waste arising in 1998 is likely to be significantly higher than the 2.7 million tonnes reported. However, waste flow data does not permit a comprehensive analysis of construction and demolition waste flows in Ireland. This problem is illustrated in Table 3.29, which summarises information reported by local authorities on construction and demolition waste management in their functional areas. It is clear from the data supplied that there is considerable movement of construction and demolition waste between local authority areas and that there are significant gaps in information at local level.

Dredge spoils arise mainly from harbour development and maintenance operations. The Marine Institute reported the amounts of dredging material disposed of in Irish Sea between 1987 and 1996 (Marine Institute, 1999). The total amount of dredge spoil disposed in 1996 was 1,388,734 tonnes with an average of 884,870 tonnes per annum over the period. There is no noticeable trend in the annual tonnages of dredging materials being disposed of and only an upper estimate for dredge spoil can be made based on permits issued for sea disposal under the Dumping at Sea Act, 1996. A total of 13 permits were granted during 1998 of which 11 related to dredge spoil. The quantities permitted are the maximum amount allowed to be disposed of so the actual figure for 1998 could be significantly below the accumulative total. The accumulative total permitted to be dumped at sea was 1,134,000 tonnes in 1998. However, based on information received from the Marine Institute and various Port Authorities, the best estimate of the actual amount dumped at sea in 1998 is 734,000 tonnes of which 40,000 tonnes is thought to have been recovered.

Table 3.29: Summary of Waste Flow Information and Landfilling Information Reported by Local Authorities for Construction and Demolition Waste (tonnes)

Local Authority	Arising in FA[1]	Imported Into FA	Exported from FA	Managed Within FA	Reported Landfilled in FA
Carlow County Council	30,000	0	0	30000	0
Cavan County Council	30,178	0	0	472	472
Clare County Council	200	0	0	200	0
Cork Corporation	218,880	21,425	83,838	302,718	240,000
Cork County Council	312,667	43,666	11,159	345,174	183,854
Donegal County Council	0	0	0	0	1,900
Dublin Corporation	614,745	0	0	0	0
Dun Laoghaire- Rathdown County Council	201,677	200,000	80,000	401,677	245,673
Fingal County Council	195,566	962,881	0	1,158,437	1,091,119

Local Authority	Arising in FA[1]	Imported Into FA	Exported from FA	Managed Within FA	Reported Landfilled in FA
Galway Corporation	0	0	0	0	0
Galway County Council	0	0	0	0	1,050
Kerry County Council	40,000	0	0	40,000	25,000
Kildare County Council	0	0	0	0	250,100
Kilkenny County Council & Kilkenny Corporation	32,400	0	0	32,400	647
Laois County Council	30,768	0	0	30,768	3,768
Leitrim County Council	0	0	0	0	0
Limerick Corporation	50,000	0	50,000	0	0
Limerick County Council	0	0	0	0	0
Longford County Council	260	0	0	0	0
Louth County Council	52,534	7,411	0	59,945	67,049
Mayo County Council	0	0	0	0	2,500
Meath County Council	10,270	0	0	10,270	4,500
Monaghan County Council	54,649	0	0	179	172
Offaly County Council	1,000	0	0	1,000	622
Roscommon County Council	13,300	0	0	13,300	0
Sligo County Council	60,000	0	0	60,000	0
South Dublin County Council	0	0	0	0	0
Tipperary County Council (NR)		0	0	0	0
Tipperary County Council (SR)	32,470	0	0	32,470	900
Waterford Corporation	27,200	0	0	27,200	0
Waterford County Council	0	0	0	0	32,832
Westmeath County Council	4,800	0	0	4,800	4,800
Wexford County Council	7,000	0	0	7,000	7,000
Wicklow County Council	72,000	0	0	0	541,000
Total	**2,092,564**	**1,235,383**	**224,997**	**2,558,010**	**2,704,958**

[1] FA: Functional area

3.8.3 RECOMMENDATION

Significant improvement is required in the quality of information available about construction and demolition waste. The Government has set specific targets for recovery of this waste stream and in the absence of comprehensive information about the waste stream it will be difficult to track progress towards meeting these targets. For instance, based on currently available information, it is not clear what proportion of this waste is being put to beneficial use and consequently recovered.

A national study is required to establish accurate and reliable statistics for this important waste stream. The main objective of this study should be to establish an acceptable baseline for construction and demolition waste from which progress towards the targets set in "*Changing Our Ways"* can be measured.

In addition, it is recommended that the targets set out in "*Changing Our Ways"* should be applied to the individual fractions that make up the waste stream such as concrete, bricks, ceramics, and gypsum-based materials, asphalt, tar and tar products, metals, etc. This would mean that the interim national target of 50% could not be met simply by recovering the soil and stones fraction of the waste stream, the easiest fraction to recover. Indeed, the Agency is of the view that the recovery target for soil and stones should be set at 100%, given the importance of this fraction as a natural resource, with the 85% target applying to the remainder of the waste stream and its individual components.

3.9 END OF LIFE VEHICLES AND SCRAP METAL

The European Commission recently published a proposal for a Council Directive on end of life vehicles. This proposed Directive lays down specific measures which aim, as a first priority, at the prevention of waste from

vehicles and, in addition, at the re-use, recycling and other forms of recovery of vehicles and their components so as to reduce the disposal of waste, as well as improving the environmental performance of the economic operators involved in the life-cycle of vehicles and in particular the operators directly involved in the treatment of end of life vehicles.

The proposed Directive requires that end of life vehicles be taken back free-of-charge. EU Member States are required to take measures to guarantee that the last owner of a car can hand it in free of charge. The proposed Directive lays down the following targets, which are required to be met by the economic operators in each Member State:

- no later than 1 January 2006, for all end of life vehicles, re-use and recovery shall be increased to a minimum of 85% by an average weight per vehicle and year. Within the same time limit the re-use and recycling shall be increased to a minimum of 80% by an average weight per vehicle and year. For vehicles produced before 1 January 1980, Member States may lay down lower targets, but not lower than 75% for re-use and recovery and not lower than 70% for re-use and recycling; and

- no later than 1 January 2015, for all end of life vehicles, re-use and recovery shall be increased to a minimum of 95% by an average weight per vehicle and year. Within the same time limit, re-use and recycling shall be increased to a minimum of 85% by an average weight per vehicle and year.

On the basis of a proposal from the Commission, the European Parliament and the Council shall establish targets for re-use and recovery and for re-use and recycling for the years beyond 2015.

Other specific measures in the proposed Directive include those for prevention, collection, treatment, re-use and recovery, coding standards/dismantling manuals along with information and reporting obligations and its implementation.

3.9.1 ARISINGS & MANAGEMENT

Information on the recycling of metals including the metal fraction from end of life vehicles is improving with information available from the various companies engaged in the collection and recovery of scrap metal, the Government scrappage scheme that operated from 1995 to 1997, and, vehicle registration statistics.

Overall the total amount of scrap metal arising in Ireland and recovered in 1998 was reported to be 187,484 tonnes. This is predominantly steel and iron scrap with other metals accounting for 17,484 tonnes. Of this total, it is estimated that 30,000 tonnes arose from end-of-life vehicles. It is not clear how many scrapped end-of-life vehicles this represents. However, given that an average car is likely to have a life-time in Ireland of ten to fifteen years, scrappage numbers can be estimated from numbers of vehicles licensed ten to fifteen years ago. In 1986, for instance, a total of 89,521 vehicles were licensed, consisting of 80,542 new vehicles and 9,069 imported used vehicles. Of the total number licensed, 62,112 were private vehicles. These figures provide an indication of the number of vehicles that were likely to be scrapped in 1998.

The Government scrappage scheme, introduced to encourage the scrappage of older vehicles, operated from July 1995 until the end of 1997 when it was discontinued. The scheme led to the removal of a total of 60,609 cars from use which were 10 or more years old. The numbers of cars scrapped per year through the scheme were 5,140 in 1995, 19,407 in 1996 and 36,062 in 1997(Pers comm Vehicle Registration Office).

Vehicle registration statistics give a clear picture of the growth in vehicle numbers in Ireland and an indication of the pressures likely to arise through the wastage of vehicles in future years. As illustrated in Figure 3.12, the number of private cars under current licence has grown from 1,054,259 vehicles in 1990 to 1,510,853 vehicles in 1998, an increase of 43% in eight years. The corresponding increase in private vehicles under current licence is from 796,408 in 1990 to 1,196,901 in 1998, an increase of 50% over the period (DoELG 1999).

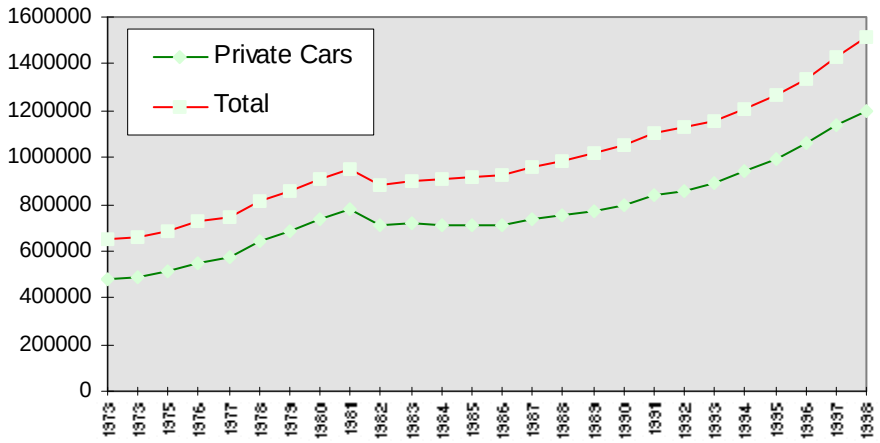


Figure 3.12: Mechanically Propelled Vehicles Under Current Licence: Private Cars and All Vehicles

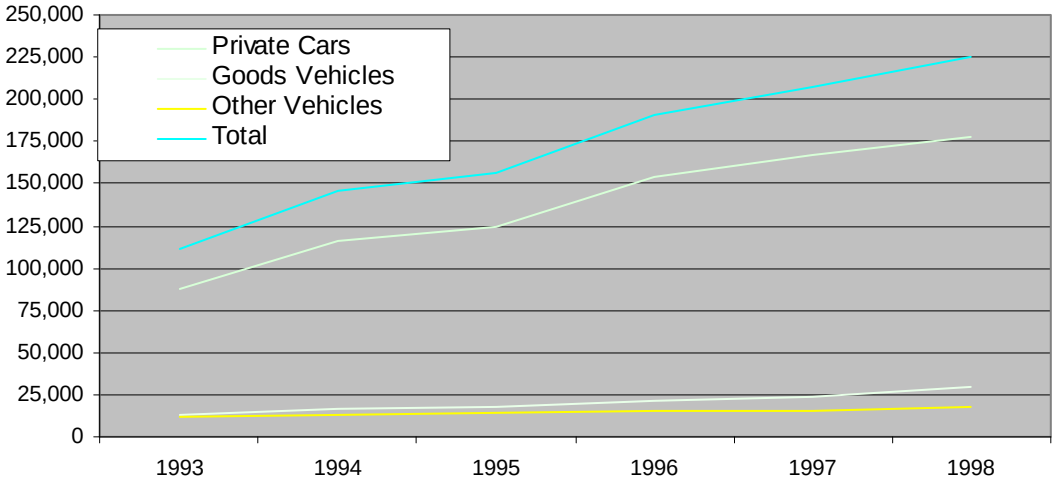


Figure 3.13: Number of Vehicles Licensed for the First Time 1990 – 1998

Figure 3.13 presents trends in numbers of vehicles licensed for the first time for the period 1993 to 1998. This includes both new vehicles and imported used vehicles. As can be seen, the overall increase is from 111,853 vehicles registered in 1993 to 225,160 vehicles registered in 1998, an increase of over 100%. The corresponding increase for private vehicles is from 87,352 vehicles in 1993 to 178,103 vehicles in 1998, an increase of 104% during the period.

3.9.2 RECOMMENDATION

Clearly, waste from end-of-life vehicles is going to grow significantly in future years. With the prospect of a Directive establishing stringent targets for re-use, recovery and recycling of end-of-life vehicles, there is an urgent need for a comprehensive evaluation of end-of-life vehicles in Ireland, including an evaluation of likely future waste arisings based on existing knowledge of vehicle registration and the infrastructural needs to ensure that the waste stream is handled appropriately.

3.10 TYRES

3.10.1 ARISINGS & MANAGEMENT

Information on the quantities of waste tyres in Ireland is still not well developed. Semperit Ireland, the major producer of tyres in 1995, has ceased operations. Best estimates of arisings since 1995 can be made from the net imports into the country assuming that all imports are replacements for existing tyres. Table 3.30 contains data on the import of various kinds of tyres into Ireland based on data from the CSO and Semperit for the period before 1995 and from CSO data between 1995 and 1998. Based on this information, an average quantity of 22,259 tonnes of used tyres are estimated to have arisen per year over the last 9 years with 29,033 tonnes estimated for 1998. Not surprisingly, figures for 1998 are considerably higher than previous years, reflecting the growth in vehicle numbers.

Waste tyres are collected by a number of collectors who grade the tyres and return a percentage of these for retreading. Farmers also provide an outlet for tyres, where they are used to hold down cover on silage pits. While no measure of the farming market capacity can be made, there has been a move towards silage bailing which will reduce the capacity of this outlet. Used tyres are also used as fenders to protect the side of boats, as building blocks in gardens and as plant pots. In the past a quantity of tyres had been landfilled and have also been used as in the construction of the leachate drainage layers in landfills. However, the recently adopted Council Directive on the Landfill of Waste (1999/31/EC) specifies that whole used tyres, excluding tyres used as engineering material and shredded tyres shall over a phased period of time not be disposed of in landfills.

Table 3.30 Summary of Waste Tyre Production in Ireland

Vehicle Type	Tonnes of Tyres (tonnes per annum)									
	1990	1991	1992	1993	1994	1995	1996	1997	1998	Average
Car	7,948	7,742	10,512	8,872	11,371	8,430		11,468	15,381	**10,216**
Bus/Lorry	6,674	5,232	6,428	5,095	6,174	8,208	7,330	8,402	10,472	**7,113**
Aircraft		190	120	46	15		60	132	78	**92**
Motorcycle			43	125	37	67	75	79	62	**70**
Bicycle	189	127	127	124	97	86	91	95	66	**111**
Other	4,215	4,199	6,624	3,404	5,837	4,944	6,280	3,433	2,974	**4,657**
TOTAL	**19,026**	**17,490**	**23,854**	**17,666**	**23,531**	**21,735**	**13,836**	**23,609**	**29,033**	**22,259**

Presently there exists no other significant recovery route for excess tyres in Ireland and some capacity for the disposal or recovery of this stream will be needed in the future. There are several methods of reclaiming materials and energy from used tyres. One way to recycle materials is to reuse the rubber in the form of granulates. Technologies exist to harness energy by combusting tyres under controlled conditions. The main methods for converting tyres to energy are incineration with energy recovered as electricity, direct use as a fuel in cement kilns, and pyrolysis (thermal degradation in the absence of oxygen). Tyres have a high energy content compared with other wastes and fossil fuels. These recovery routes together with any other viable options will have to be assessed in the near future.

3.11 ELECTRICAL & ELECTRONIC EQUIPMENT

The European Commission has prepared a proposal for a Directive on waste from electrical and electronic equipment (WEEE). A Directive is considered necessary for this waste stream because of the potentially hazardous nature of the stream and expected growth rates of 3 – 4% per annum. The proposal sets out measures that aim, in the first instance, to prevent the generation of waste from electrical and electronic

equipment, followed by encouraging re-use, recycling and other forms of recovery, and finally at minimising the risks and impacts to the environment associated with the treatment and disposal of end-of-life electrical and electronic equipment.

The categories of electrical and electronic equipment covered by the proposal are:

- Large Household Appliances (such as fridges, washing machines, cookers, dishwashers etc.)
- Small Household Appliances (such as vacuum cleaners, irons, toasters, coffee machines etc.)
- IT Equipment
- Telecommunications Equipment
- Radio, Television, Electroacoustic, Musical Instruments
- Lighting Equipment
- Medical Equipment
- Monitoring & Control Instruments
- Toys
- Electrical and Electronic Tools, and
- Automatic Dispensers

The proposal envisages separate collection systems being established by Member States so that end-of-life electrical and electronic equipment can be returned to the producer. A separate collection target for private households of 4 kg/inhabitant/year is included in the proposal. The proposal also envisages the phasing out of hazardous substances in electrical and electronic equipment and sets targets for the phasing out of lead, cadmium, mercury, hexavalent chromium and halogenated flameretardents. A set of recovery targets is also presented in the proposal with the targets ranging from 70% to 90% re-use and recycling of separately collected materials.

3.11.1 ARISINGS & MANAGEMENT

There is no specific information on WEEE arisings in Ireland. The EU Priority Waste Stream Project Group on WEEE, set up to consider options in relation to the management of the waste stream, estimated that future quantities of WEEE will be over 20 kg per person per annum, of which the consumer will account for 12 kg, the industrial sector 5 kg and cables 3 kg. If this figure is applied to the Republic of Ireland, total estimated arisings would be in the region of 74,000 tonnes per annum, with approximately 44,500 tonnes per annum generated by households.

Less than 1,000 tonnes of WEEE was reported by local authorities to be collected for recovery, mostly fridges and other white goods. While almost all civic waste facilities operated by local authorities now have areas where white goods can be delivered, the infrastructure for separate collection and processing of WEEE is very poor in Ireland.

3.11.2 RECOMMENDATIONS

In light of the proposed Directive on waste from electrical and electronic equipment, there is an urgent need for a comprehensive evaluation of this waste stream in Ireland. This evaluation should include the establishment of baseline information on quantities of WEEE arising, the development of projections of future likely arisings, an evaluation of current WEEE management practices and an evaluation of options for both the separate collection and recovery of the waste stream.

4. WASTE MANAGEMENT INFRASTRUCTURE

4.1 OVERVIEW

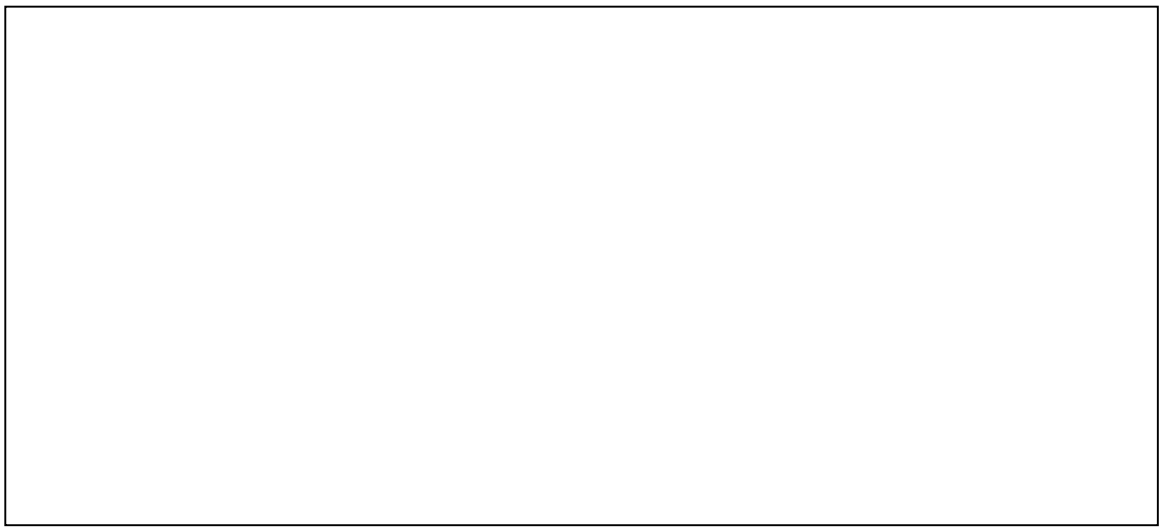
This chapter provides an overview of waste recovery and disposal activities in Ireland in 1998. Waste recovery infrastructure consists of a growing number of bring banks both in urban and rural areas. There is also a growing number of civic waste facilities mostly on existing landfills where the public can deposit recyclable materials, and a growing number of transfer stations. The disposal facilities are almost exclusively landfills of which there were 126 active sites in 1998 with 76 of these classified as local authority landfills. Information in this chapter is based on an analysis of the local authority questionnaires and returns from industries that operate on-site facilities.

4.2 WASTE COLLECTION, MOVEMENT AND TRANSFER

4.2.1 WASTE COLLECTION

The practice of waste collection in Ireland is changing rapidly. Changes include improving facilities for collection of recyclable fractions, increasing source segregation of putrescible wastes and dry recyclables and more efficient collection. There have been significant increases in the reported number of bring banks. In addition, civic waste facilities, which deal with a wide variety of wastes, are becoming more common. Recent local authority waste management plans set targets for improved waste collection over the next five years. Following from this, it is likely that we will see a considerable increase in kerbside collection systems from households, dedicated waste collection for hazardous waste from both the household and commercial sectors and a move towards weight-based charging for waste collection. The Waste Management Act provides local authorities with considerable powers in relation to both the presentation and collection of waste and over the next few years radical changes in the manner with which waste is both presented for collection and collected are anticipated.

The majority of local authority areas have increased their stock of bring banks since 1995. In 1998, 837 bring banks were reported throughout the country. This is an increase from the 426 reported in 1995. Map 1 (Appendix C1) compares bring bank numbers in each county in both 1995 and 1998 while Map 2 (Appendix C1) illustrates the number of bring banks per head of population, a key indicator for bring banks. While increases are evident in most local authority areas, the most striking increase occurred in Co. Wexford, where 102 bring banks were reported.



Photograph 4: Municipal Waste Collection

Of the 837 bring banks reported, 649 have facilities for glass collection, 509 for cans, 380 for textiles, 34 for paper, 14 for waste oils, 7 for PET and 6 for batteries. Clearly, while there is growing coverage for the collection of glass, cans (mainly aluminium) and textiles, there is very poor coverage for plastics, steel, paper and other materials.

A total of 30 civic waste facilities were reported in 1998. This is an increase of 2 over the 28 reported in 1995. However, there has been considerable activity in this area towards the end of 1998 and during 1999 and the best estimate at time of going to press is that approximately 38 civic waste facilities are now established throughout the country. The location of known civic waste facilities at time of going to press is presented in Map 3 (Appendix C1). The majority of these facilities are located on existing or closed landfill sites, with a number occurring as either stand-alone sites or associated with transfer stations. Most civic waste facilities have facilities for both the reception of recyclable materials such as glass and cans, and the reception of bulky materials such as fridges.

Curb side collection is the separate collection of a number of recyclable fractions of household waste. The best known of these schemes is the Kerbside Dublin scheme, which services 50,000 households in the greater Dublin area. Similar schemes are planned for other urban centres around the country.

Waste collection for disposal has also improved with the introduction of wheelie bin services. As well as improving the cost efficiency of waste collection, the introduction of wheelie bin services will also enable the introduction of weight based charging through on board weighing systems. To date, no weight based charging system has been introduced although it is mentioned in some waste management plans.

Waste collected for recovery or disposal is generally either taken directly to the facility where the disposal or recovery operation takes place or is taken initially to a transfer station where some pre-processing of the waste may occur. This pre-processing can include bulking of wastes for transfer or segregation of certain wastes for recovery and dispatch of the residual material for disposal. With the numbers of active local authority landfills decreasing, the number of transfer stations is expected to increase to facilitate material recovery and to ensure more cost-effective transport of wastes.

Map 4 (Appendix C1) shows the location of reported transfer stations up to mid-1999.

4.3 WASTE PREVENTION AND MINIMISATION AND CLEANER PRODUCTION

While a significant improvement in the infrastructure for recovery of materials once they become waste has occurred over the last three years, the creation of programmes to prevent waste production or to reduce the amount produced are less well developed. This is especially true of the municipal sector where the amount of waste presented for disposal/recovery continues to increase. The Environmental Awareness Programme launched recently by the Minister for the Environment and Local Government should encourage waste prevention and minimisation in the municipal sector.

The preferred options in relation to waste are waste prevention and waste minimisation. They are also the most challenging options as their successful implementation requires a change in the mindset and attitudes of the waste producer. At product development and manufacturing level, each step in the chain has to be considered in relation to its waste production potential. At consumer level, the consumer needs to consider the waste implications of particular purchases. As illustrated in Figure 4.1 each step in the chain from raw material extraction and energy production to product manufacture and consumption can result in the production of waste. Waste prevention and minimisation strategies therefore need to acknowledge this so that targets and objectives are set with a view to achieving sustainability.

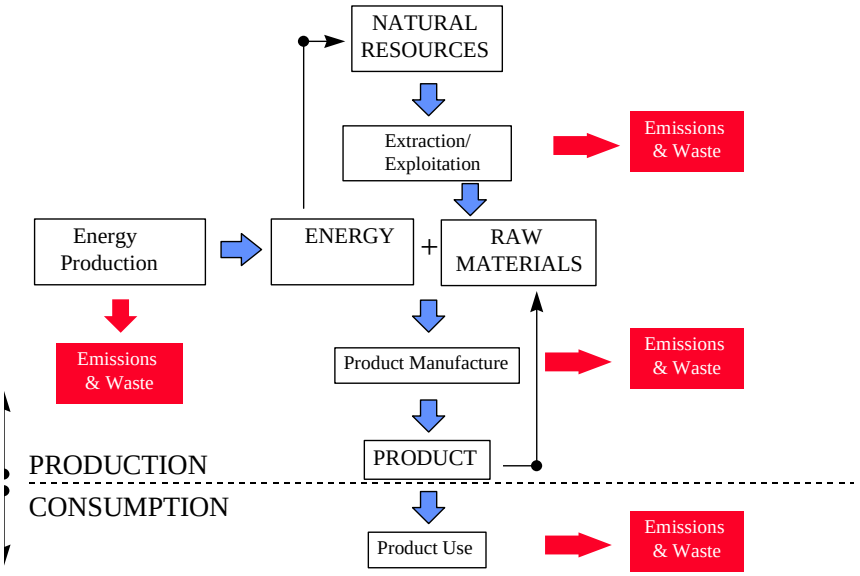


Figure 4.1: The Relationship between the Production and Consumption Cycle and Waste Generation

Waste prevention and minimisation strategies have, by their nature, a positive impact on the environment. In many cases, strategies are put in place to either replace or modify existing processes that lead to waste production so as to reduce the volume and toxicity of waste produced. They also tend to lead to improved environmental performance and more efficient use of energy and natural resources as the life-cycle or cradle to grave approach is central to the success of such strategies.

There have been a number of initiatives in the area of cleaner production and waste prevention/minimisation in the recent past. These are listed in Table 4.1. Of particular interest are the initiatives tied into the Proposed National Hazardous Waste Management Plan and the Cleaner Production Demonstration Programme funded through the European Regional Development Fund.

The promotion of cleaner production, waste prevention and minimisation is at the core of environmental policy in Ireland. The Waste Management Act introduced a legal framework for waste prevention and minimisation by placing an obligation on any person who carries out any activity of an agricultural, commercial or industrial nature to, among other things, have due regard to the need to prevent or minimise the production of waste from that activity. In practice, this obligation will be enforced through the making of specific Regulations dealing with specific waste streams, the Packaging Regulations being the first to be made under the relevant section. It is expected that similar Regulations will be introduced for waste streams such as end of life vehicles, construction and demolition waste and waste from electrical and electronic equipment.

Waste prevention and minimisation strategies are to play a central part in waste planning in the future although it is too early to evaluate the relative success of measures contained in either Waste Management Plans or the Proposed National Hazardous Waste Management Plan. The general trend towards the adoption of an environmental management systems approach to environmental protection should also lead to the adoption of strategies for waste prevention and minimisation at company level.

Table 4.1: Summary of Recent Waste prevention and Minimisation Initiatives in Ireland

Initiative/Measure	Responsible Body	Summary Description
Local Authority Waste Management Plans (since 1998)	Local Authorities	Under the Waste Management Act, 1996, all local authorities are required to prepare and implement a Waste Management Plan. These plans include objectives in relation to prevention and minimisation of wastes. They also include objectives in relation to the recovery of waste.
National Hazardous Waste Management Plan (1999)	EPA	Under the Waste Management Act, the Environmental Protection Agency is required to prepare a Hazardous Waste Management Plan for the country. This plan is to have regard to the prevention and minimisation of hazardous waste and set objectives and, where appropriate, targets in relation to the prevention and the minimisation of hazardous waste, the minimisation of the harmful nature of such waste and the recovery of hazardous waste (see below for further information).
Integrated Pollution Control Licensing (since 1994)	EPA	Under the Environmental Protection Agency Act, 1992, the Environmental Protection Agency is responsible for Integrated Pollution Control licensing of scheduled activities. These include all major manufacturing activities in the country. Each licence contains a specific condition relating to the establishment of an Environmental Management System (EMS). Through the EMS the licensee must assess all operations and review all practicable options for the use of cleaner technology, cleaner production and the reduction and minimisation of waste at the facility.
Waste Licensing (since 1997)	EPA	Under the Waste Management Act, 1996, the Environmental Protection Agency is responsible for licensing scheduled waste recovery and disposal activities. Each licence requires that the licensee establish an Environmental Management System (EMS). The EMS provides a mechanism for ongoing improvement in environmental performance by the licensee. For instance, transfer stations are required to introduce or extend recycling of wastes handled by the facility. Landfill site operators are required to provide for recycling of wastes such as construction and demolition waste, to assess and introduce, if possible, the utilisation of landfill gas, and to introduce methods for the recovery of sewage sludge.
Packaging Regulations (1997)	Local Authorities	The Waste Management (Packaging) Regulations, 1997, impose obligations on persons and businesses which supply packaging (i.e. packaging materials, packaging or packaged goods) to the Irish market, whether as retailers, packers, fillers or manufacturers. The Regulations require suppliers to either participate in an approved packaging waste recovery scheme or to implement steps themselves to assist the recovery of packaging waste.
Cleaner Production Pilot Demonstration Programme (June 1997)	EPA	This programme, which is administered on behalf of the Department of the Environment and Local Government by the Environmental Protection Agency, was established to promote a more environmentally friendly approach to production in the manufacturing and services industries in Ireland (see below for further details).
Demonstration Scheme for the Development of Environmentally Superior Products (1999)	Enterprise Ireland	A grant-assisted pilot demonstration scheme to be operated by Enterprise Ireland which will be directed towards indigenous small to medium sized enterprises engaged in manufacturing.
European Union Eco-Labelling Scheme	National Standards Authority of Ireland	The objectives of the scheme are to promote the design, production, marketing and use of products which have a reduced environmental impact during their life-cycle; and to provide consumers with better information on the environmental impact of products and to encourage preferential consideration of eco-labelled products in purchasing decisions.
Environmental Audit and Waste Minimisation Grants	Enterprise Ireland	This grant scheme provides financial assistance to manufacturing industry to enable firms to engage consultants to carry out environmental audits of their activities. The aim of the scheme is to improve the environmental performance of Irish industry while at the same time maintaining business competitiveness. The scheme is operated by Enterprise Ireland with the support of funds made available through the European Union and is administered by the Environmental Grant Unit, based in Enterprise Ireland, Glasnevin, Dublin.
Environmental Management System Grant Scheme	Enterprise Ireland	This grant scheme provides financial assistance to small and medium sized indigenous Irish manufacturing industries to enable them to engage independent consultants to support and train the company's management in the installation and running of an Environmental Management System.

Initiative/Measure	Responsible Body	Summary Description
Environmental Awareness Programme	DoELG	This programme is aimed at encouraging the identification and pursuit of environmental sustainable behaviour through the undertaking of a campaign of public information and awareness of environmental issues.

4.3.1 NATIONAL HAZARDOUS WASTE MANAGEMENT PLAN AND WASTE PREVENTION

The cornerstone of the National Hazardous Waste Management Plan is prevention and the Proposed Plan, launched in September 1999, sets out how hazardous waste prevention can benefit Irish industry and minimise hazardous waste costs. Integrated Pollution Control licensing has to date resulted in the prevention of significant quantities of hazardous waste. The plan recommends the adoption of an ambitious Prevention Programme with the following key elements:

- no increase in the quantity of hazardous waste subject to disposal operations;
- the development and implementation of a Prevention Programme inclusive of demonstration projects, information dissemination, assistance to industry, educational initiatives, research and support staff; and
- the establishment of a core of expertise or 'prevention team' to prioritise and co-ordinate the implementation of the Prevention Programme.

Under the Prevention Programme, significant amounts of financial and technical assistance would be invested in participating companies thereby increasing the net saving to industry; overall a 'win-win' situation for both industry and the environment.

4.3.2 CLEANER PRODUCTION PILOT DEMONSTRATION PROGRAMME

The Environmental Monitoring R&D sub-programme of the Operational Programme for Environmental Services 1994-1999 was organised into two Measures; Environmentally Sustainable Resource Management and Cleaner Production. Under the Cleaner Production Measure, a pilot demonstration programme was organised by the EPA. This programme sought to promote environmentally friendly production through the application and demonstration of cleaner systems, techniques and technology. The demonstration programme was aimed primarily at small and medium sized enterprises to help them operate in a more environmentally sustainable manner. The programme was launched in 1997 and 14 companies were selected. Table 4.2 lists the projects undertaken. Details of each project are provided in Appendix F.

Table 4.2 Cleaner Production Demonstration Projects

Company	Project Title
A.T Cross	Waste Minimisation at A.T. Cross Plant, Ballinasloe
Avonmore Waterford Group	Integrated Constructed Wetlands Reduces Impact of Land Spreading of Effluent
C Fab Manufacturing	Reduction of VOC Emissions, Effluent & Solid Waste
Coates Lorilleux	Reduction of VOC Emissions & Packaging Waste
Dairygold	Converting Dairy Sludge into Fertiliser
Hitech Plating	Minimisation of Environmental Effects at a Surface Treatment & Metal Finishing Facility
Mallinckrodt Medical Imaging	Enhanced Cooling Tower Treatment System
John Ronan & Sons	Waste Minimisation in the Tanning Industry
SIFA	Turning a Waste Stream into a Commercial Product
Sifco Turbine Components	More Efficient Use of Materials and Energy
Waterford Stanley	Reclamation of Vitreous Enamel Overspray
Yeats Room	Minimising Environmental Impact in the Hospital Sector
Youghal Carpets Yarns	Reduction in Use of Oil, Chemicals, Dyestuffs & Water
Yves Rocher Manufacturing (Irl)	Waste Minimisation in the Cosmetics Sector

4.4 RECYCLING, RE-USE AND RECOVERY

After waste prevention and waste minimisation, the next best environmental option in relation to waste management is, generally, recovery which includes re-use, energy recovery and material recycling. However, waste recovery is not necessarily environmentally benign and waste recovery operations can have a negative impact on the environment. The main environmental advantage afforded by waste recovery is a saving on the use of natural resources or virgin material that might otherwise have been used had recovered material not been available. However, when considering the net environmental impact, this needs to be balanced against the overall cost to the environment in relation to energy usage and pollution that might arise as a result of the recovery process itself. Unfortunately, once a waste is produced, its management is likely to result in negative environmental impacts whether the waste is recovered or disposed of. This highlights, again, the importance of waste prevention and minimisation and the importance of integrating waste issues into the production/consumption cycle so that products are designed to have as little impact as possible on the environment when they become redundant.

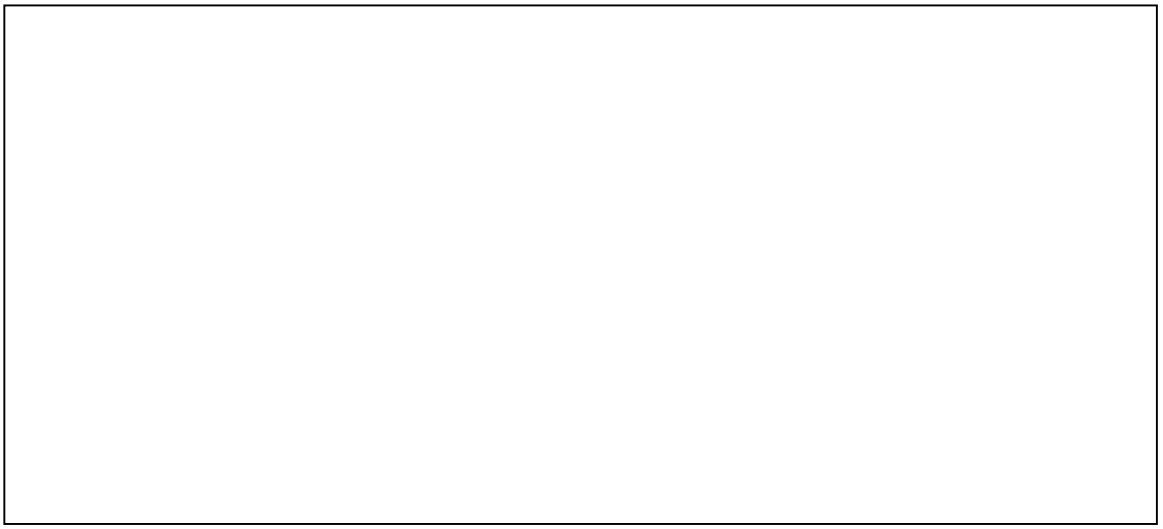
As indicated in the previous section, there has been an increase in the level of recovery activity since 1995, both in the municipal and industrial sectors. Glass recovery, for instance, has increased from 28,500 tonnes per annum in 1995 to 36,000 tonnes in 1998, with every expectation that the trend will continue. Similarly, despite adverse economic conditions, paper recovery has also increased in this period from 84,000 tonnes in 1995 to over 94,302 tonnes in 1998. This may be a function of improved reporting in 1998.

There has also been significant improvement in industrial recovery rates with the overall rate for reported waste arisings increasing from 12.4% in 1995 to 31.0% in 1998. The recovery rate for the manufacturing sector, mainly consisting of companies controlled through IPC was 51.4% for 1998.

4.4.1 MUNICIPAL SECTOR

The development of infrastructure for recycling, re-use and recovery in the municipal sector over the past three years has mainly been driven through funding made available to both public and private sector projects under the Waste Management sub-programme of the Operational Programme for Environmental Services, 1994-1999. Table 4.3 lists public sector projects funded through this programme while private sector projects that received funding are listed in Table 4.4. In total, in the region of £4.6 million pounds was allocated to private sector projects with £2.7 million pounds provided to local authority initiatives.

Many of the projects listed in Tables 4.3 and 4.4 will result in improved infrastructure for the collection, sorting and recovery of waste materials.



Photograph 5: Bailed Plastic Waste

Table 4.3: Public Sector Projects Funded through the Operational Programme 1994-99

Grantee	Project Summary	Grant (£)
Carlow County Council	Purchase of storage containers for recyclable goods	4,511
Cork County Council	Setting up additional Bring Sites	33,750
Donegal Co. Council	Home Composting Project	2,244
Galway Co. Council	Home Composting Project	3,231
Kerry Co. Council	Composting scheme	131,500
Kildare Co. Council	Home Composting Project	2,450
Laois Co. Council	To provide a civic amenity site and collection depots	40,935
Limerick Corporation	Composting Project – Phase 1	454,677
Limerick Co. Council	To purchase a wood-chipper for recycling green waste	15,000
Mayo Co. Council	To provide Bring sites	25,534
Meath Co. Council	Home Composting Project	1,500
Roscommon Co. Council	Home Composting Project	2,359
South Dublin Co. Council	To provide a Green Waste Facility and a Home Composting scheme	276,900
Tipperary South Riding Co. Council	To provide a recycling depot	22,500
Waterford Corporation	To provide Bring sites and a Civic Amenity Site	104,250
Waterford Co. Council	To provide Bring sites	39,752
Wicklow Co. Council	To provide Bring Sites and a Home Composting Scheme	24,426
Cork Corporation	Project to locate 14 bring sites for recyclables (glass, cans, textiles and paper/cardboard, where possible) in strategic locations around the city	42,000
Cork Co. Council	Home Composting Project	9,370
South Dublin Co. Council & Dublin Corporation	Project to purchase green boxes for the expansion of the Kerbside Dublin collection scheme	37,933
Clare Co. Council	Extension of existing bring sites, by providing further banks for recyclables, and establishing new bring sites	51,568
Cork Co. Council	Shredding equipment for green waste composting; recycling containers for bulky waste metal goods, tyres etc.	54,400
Dun Laoghaire Rathdown Co. Council	Provision of 39 bring sites	70,200
Fingal Co. Council	Construction and demolition waste project at Balleally landfill. Facility to be provided by Council and operated by private sector.	365,695
Leitrim Co. Council	Provision of 8 bring sites	90,000
Sligo Co. Council	Provision of 8 bring sites	8,667
Waterford Co. Council	Provision of 1 large bring centre and 4 small centres	41,224
Tipperary North Riding Co. Council	Provision of baler and shredder for Nenagh Recycling Scheme	30,964
Monaghan Co. Council	Development of a recycling facility at Derryarrilly/ Letterbane Landfill Site. The facility is to be leased to private sector operators who will operate the facility to which the public will have access. [capital cost: 559,000]	400,000
Meath Co. Council	Development of a civic amenity site at Navan, providing facilities for the public to drop-off recyclable materials. [capital cost: 323,000]	237,900
Dundalk UDC	Civic amenity site	215,156
Donegal Co. Council	Carndonagh civic amenity site	94,500
Donegal Co. Council	Bring sites	42,313
Dun Laoghaire Rathdown Co. Council	Purchase of green boxes for expansion of Kerbside Dublin Scheme	25,092

Table 4.4: Private Sector Projects funded through the Operational Programme 1994-99

Grantee	Address	Project Summary	Grant (£)
Cork Recycling Co.	Togher, Co. Cork.	Recycling scheme to collect, segregate and bale waste paper	74,500
Midland Waste Disposal Ltd.	Kells, Co Meath.	Project to retrieve and bale waste including cardboard, PET, PVC, steel and timber	90,800
Mr. Binman Ltd.	Kilmallock, Co. Limerick.	Project to establish a recycling and transfer station - initially for cardboard then glass, cans and ferrous metals	60,700
Leech Papers	North Strand, Dublin 1	Project to extend existing paper recycling activities and to produce a higher grade of recycled paper	39,656
D.M. Waste	Letterkenny, Co. Donegal	Project to collect and bale waste paper, cardboard, glass and cans for recycling	108,500

Grantee	Address	Project Summary	Grant (£)
Returnbatt Ltd.	Kildare Enterprise Centre, Kildare.	Project to recycle industrial and car batteries	187,500
Shabra Recycling Ltd.	Castleblayney, Co. Monaghan	Recycling scheme to collect polythene, cardboard and plastic waste; to separate, grade and recover as recycled polythene or material for reuse	73,000
Recoverable Resources Co-op Ltd.	Tallaght, Co. Dublin	Project to increase the number of can banks in Dublin and to upgrade baling and sorting facilities for can recycling	20,900
Bailey Waste Paper Ltd.	Manor Street, Dublin 7	Project to recycle timber pallets "chips" for use in the chipboard industry, animal bedding and for garden use	80,777
Alina Plant Hire Ltd.	Tullamore, Co. Offaly	Project to extend existing recycling activities incorporating shredding and granulating paper, cardboard and PVC	48,200
Rehab Recycling Partnership	Santry, Dublin 9	Project to upgrade and expand paper recycling facility	20,000
Bailey Waste Paper Ltd.	Blanchardstown, Dublin 15	Project to recycle paper by producing a pulp substitute fibre suitable for re-use in production of paper	123,068
Cavan Waste Disposal Ltd.	Crossdoney, Co. Cavan.	Project to develop a recycling facility for commercial waste	60,983
Cerebral Palsy (Irl) Ltd.	Glasnevin, Dublin 9	Project to expand facilities for the collection of old clothing and to set up a unit to sort and grade the collected textiles	27,711
Cork Metal Co. Ltd.	Dublin Hill, Cork	Project to expand the collection and segregation of metals and prepare these for onward processing	113,889
Hammond Lane Metal Co. Ltd.	Ringaskiddy, Cork	Project to separate non-ferrous metal (brass, copper and aluminium) from plastics, rubber, foam and dirt	54,405
Hegarty Hammond	Limerick	Project to establish a fragmentation/shredding facility at company premises in Ballysimon	400,000
Ipodec Ireland Ltd.	Tallaght, Dublin 24	Project to construct a waste transfer/waste management facility, incorporating facilities for recycling	375,441
Kerbside Dublin	Tallaght, Dublin 24	Project to upgrade existing equipment and to purchase additional equipment for current operations	61,338
Killencoole Garden Compost Ltd.	Dundalk, Co. Louth	Project to recycle spent mushroom compost for commercial supply as compost	105,555
Limerick Waste Enterprises	Galvone Industrial Estate, Limerick	Project to collect and recycle waste paper and cardboard	63,221
Recycling 2000	Rosslare Road, Wexford	Project to expand facilities for the collection and recycling of newsprint for animal bedding and to shred and bale magazines and glossy brochures for recycling in UK	69,773
Waste Disposal Sligo Ltd.	Deepwater Quay, Sligo	Project to sort mixed waste from various sources including existing skip customers and send recyclable waste to recycling outlets	70,000
Waterford Utility Services	Butlerstown, Waterford	Project to collect, segregate, store and bale cardboard, greyboard and white paper	35,921
Shabra Recycling Ltd.	Castleblayney, Co Monaghan	Project to collect and wash contaminated plastic from agricultural and other sources for recycling	327,000
Textile Recycling Ltd.	Basin Street Upper, Dublin 8	Project to relocate and expand existing textile recycling business	287,853
Galway Metal Company Ltd.	Oranmore, Co. Galway	Project to recycle metals, paper, cardboard and glass and to develop an integrated recycling facility	203,534
Smurfit Recycling	Walkinstown, Dublin 12	Project to upgrade existing cardboard processing equipment to a higher capacity	96,376
Greenvalleys Recycling & Trading Co. Ltd.	Kilbride, Co. Wicklow	Project to expand existing facilities for the collection and processing of various wastes, including a pilot kerbside project	48,300
Aggregate Production Services	Crecora, Co. Limerick	Project to recycle construction and demolition waste	48,532
Thornton Waste Ltd.	Ballyfermot	Facilities to process construction and demolition waste	388,225
Timpeallacht na nOileain	Galway	Recycling facilities for the three Aran Islands	236,400

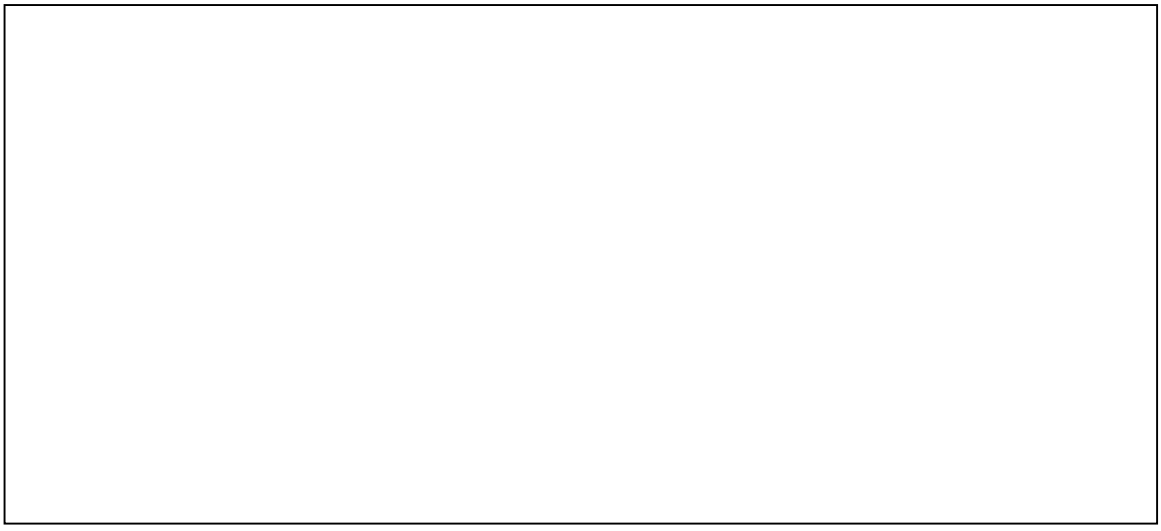
Grantee	Address	Project Summary	Grant (£)
Hammond Lane	Cork	Relocation and upgrading of existing plant and purchase of new equipment, primarily for metal recycling.	400,000
Rehab Recycling Partnership	Dublin	Development of a large scale glass recycling facility at Ballymount, Co. Dublin	400,000

BIODEGRADABLE WASTE - COMPOSTING

Composting of biodegradable wastes, such as kitchen wastes and green wastes, and paper waste provides a viable alternative to disposal. A key component of the Government's waste strategy is a 65% reduction in the quantity of biodegradable waste being consigned to landfill and the development of biological treatment facilities, including composting, capable of treating up to 300,000 tonnes per annum. It is estimated that 1,003,053 tonnes of biodegradable waste, consisting of paper waste and kitchen and garden waste, were consigned to landfill in 1998.

Composting can be established either as centralised municipal composting, where biodegradable waste is collected separately from households and commercial enterprises and brought to a dedicated plant, or in the home, through the establishment of home composting schemes. For either to work requires that the producer separate biodegradable waste at source. This tends to be a major impediment to the development of composting, as it requires significant effort and commitment by individual householders. Centralised schemes are more suited to urban areas while home composting schemes suit rural areas with low-density populations. However, a major drawback to home composting is that the homeowner must both separate out his or her biodegradable waste and compost the waste. Centralised composting, on the other hand, requires homeowners to separate out their biodegradable waste and present it separately for collection. Significant commitment and support is therefore required to make home composting schemes successful. If composting is to play a significant part in the diversion of biodegradable waste away from landfill, it is clear that centralised composting with separate collection will be required.

The development of composting as an alternative to landfill has been very slow in Ireland. A number of home composting schemes have been set up by local authorities with eight such schemes receiving funding under the Waste Management sub-programme of the Operational Programme for Environmental Services, 1994-1999. Centralised composting of municipal waste is under development in South Dublin (green waste), Cork (green waste), Limerick (green waste and kitchen waste) and Kerry (green waste and kitchen waste). There will need to be considerable development in centralised composting in the short term if composting is to contribute significantly to the diversion of biodegradable waste away from landfill. Given the fact that the decomposition of biodegradable waste is responsible for most of the environmental problems arising in landfills such as leachate contamination, landfill gas and odours, a stronger emphasis on centralised composting and other biological treatment processes such as anaerobic digestion as alternative means of treating biodegradable wastes is recommended.



Photograph 6 :St. Anne's Green Waste Composting Facility

4.4.2 INDUSTRIAL SECTOR

The majority of non-hazardous and hazardous waste recovery within the industrial sector occurs on the site at which the waste is produced. In addition to the various reprocessing companies for the municipal sector who, in most cases also accept waste from the industrial sector, there are a number of companies engaged in the recovery of hazardous waste.

4.5 THERMAL TREATMENT

4.5.1 MUNICIPAL SECTOR

There are, currently, no municipal thermal treatment plants in Ireland, in marked contrast to other European countries. The relative merits of this situation are the subject of some debate at present with many Waste Management Strategies and Plans considering incineration and other thermal treatments such as gasification and pyrolysis as key components of an integrated approach to waste management options. In addition, two feasibility studies have been carried out which have examined the technical, environmental, financial and social advantages and disadvantages of thermal treatment in the greater Dublin area and two regions, the North East and the Mid West.

4.5.2 INDUSTRIAL SECTOR

A number of facilities have been licensed to operate incinerators under the IPC licensing regime. In each case, incineration activities are limited to waste produced on the site with no other waste accepted for treatment. Six industrial facilities have been licensed for the incineration of hazardous waste under class 11.1 of the First Schedule to the EPA Act, 1992. These are:

- Lawter International Luxembourg S.a.r.l., Grannagh, Co. Kilkenny;
- Roche Ireland Ltd, Clarecastle, Co. Clare;
- Eli Lilly S.A. Dunderrow, Kinsale,Co. Cork;
- SmithKline Beecham (Manufacturing) Ltd., Currabinny, Carrigaline, Co. Cork;
- Novartis Ringaskiddy Limited, Ringaskiddy, Co. Cork;
- Yamanouchi Ireland Company Ltd. Damastown, Mulhuddart, Dublin 15; and

Energy is recovered at the plants operated by Lawter International, Roche Ireland Ltd and Novartis Ringaskiddy Limited.

4.6 DISPOSAL

4.6.1 ACTIVE LANDFILLS

Landfilling remains the predominant waste disposal practice in Ireland. In 1998, it is estimated that 8,780,201 tonnes of waste were consigned to landfill, with 4,864,128 tonnes disposed of in on-site private landfills, 2,744,501 tonnes disposed of in landfills operated either by or on behalf of local authorities with an additional 1,171,572 tonnes of construction and demolition waste being recovered at local authority landfills. The total amount accepted into local authority landfills in 1998 was 3,916,073 tonnes. A summary of waste accepted into landfills in 1998 is presented in Table 4.5 and Figure 4.2. Site specific information on waste accepted at each landfill is presented in Appendices C2 – C4, together with a comparison between 1995 and 1998 data reported for each site.

Table 4.5: Summary of Major Waste Types Accepted into Irish Landfills in 1998

Landfill Type	Number	Waste Accepted (tonnes)					
		Household	Commercial	Construction	industrial	Others	TOTAL
Local Authority	76	1,116,688	536,068	1,887,751	181,548	194,018	3,916,073
Private/ Industrial	50	9,010	24,000	817,207	3,717,133	296,778	4,864,128
TOTAL	**126**	**1,125,698**	**560,068**	**2,704,958**	**3,898,681**	**490,796**	**8,780,201**

Map 5 (Appendix C1) shows the geographical location and size of all operating landfills in Ireland in 1998, both public and private. Landfills are categorised in Table 4.6 as being very small, small, medium or large depending on the volume of waste accepted per annum. Of the 76 local authority landfills reported to be receiving municipal waste, 31 were receiving less than 10,000 tonnes/annum with 16 receiving greater than 40,000 tonnes/annum. Generally, as illustrated in Figure 4.3, there is a trend towards a decreasing number of local authority landfills with the relative size of landfills increasing. In 1995, there were 87 active local authority landfills compared with 76 in 1998. Since 1998, a further 26 of these local authority landfills are thought to have ceased accepting waste leaving a total of 50 local authority landfills in operation at time of going to press. The remaining lifespan of local authority landfills is illustrated in Map 6 (Appendix C1). Of the 50 local authority landfills known to be operating at time of going to press, twelve have an expected lifespan of more than ten years, thirteen are expected to remain open for between five and ten years with the remainder expected to close within the next five years. In addition, the EPA is in receipt of waste licence applications for six new local authority landfills (in Wicklow, Limerick, Tipperary (x2), Meath and Clare).

Table 4.6: Summary of Relative Size of Irish Landfills in 1995 and 1998

Landfill Type	Very Small (<10,000 t/a)		Small (10 - 20,000 t/a)		Medium (20 - 40,000 t/a)		Large (>40,000 t/a)		Unknown	
	1995	1998	1995	1998	1995	1998	1995	1998	1995	1998
Local Authority	41	31	20	9	16	20	10	16	0	0
Private/Industrial	12	20	2	4	5	8	0	11	12	7

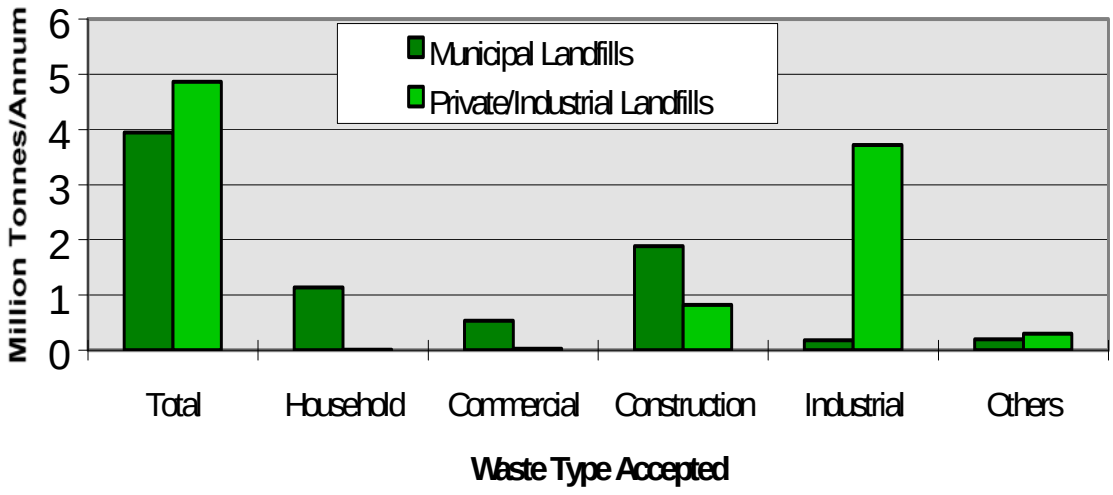


Figure 4.2: Summary of Wastes Accepted by Municipal and Private/Industrial Landfills in 1998

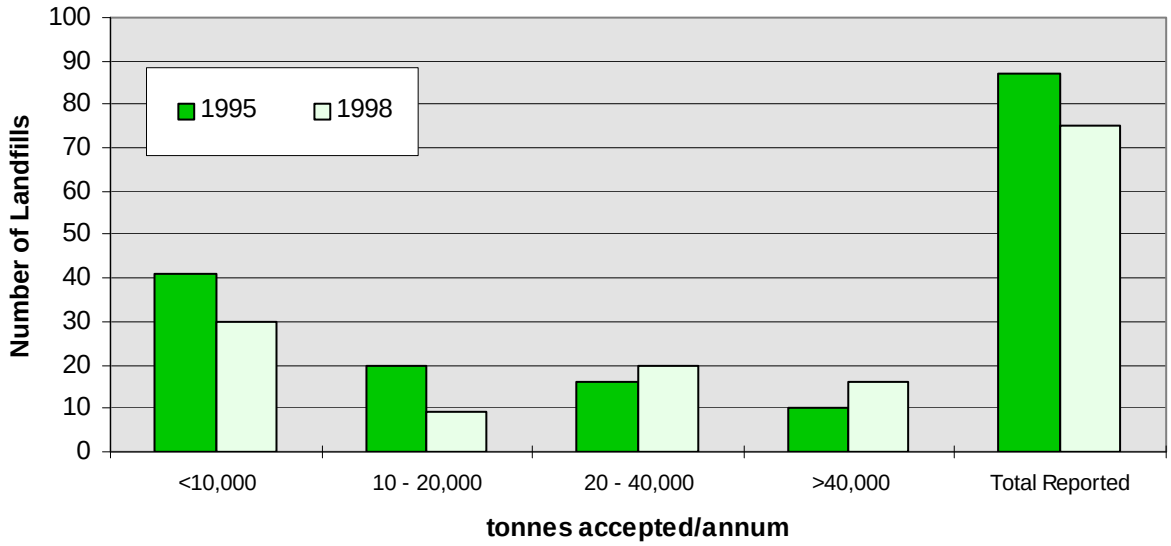


Figure 4.3: Comparison of Relative Size and Numbers of Local Authority Landfills in Ireland in 1995 and 1998

In relation to private/industrial landfills, the number reported in 1998 (50) was considerably higher than for 1995 (31). This is partly a function of better reporting by local authorities but also reflects the growth in private landfills particularly in and around the Greater Dublin region. While private/industrial landfills received in the region of 4.9 million tonnes of waste in 1998, it should be noted that two industrial sites accounted for 3.2 million tonnes of this total. The remaining private/industrial landfills mainly receive construction and demolition type waste. A comparison of the relative number and size of private/industrial landfills in 1995 and 1998 is presented in Figure 4.4.

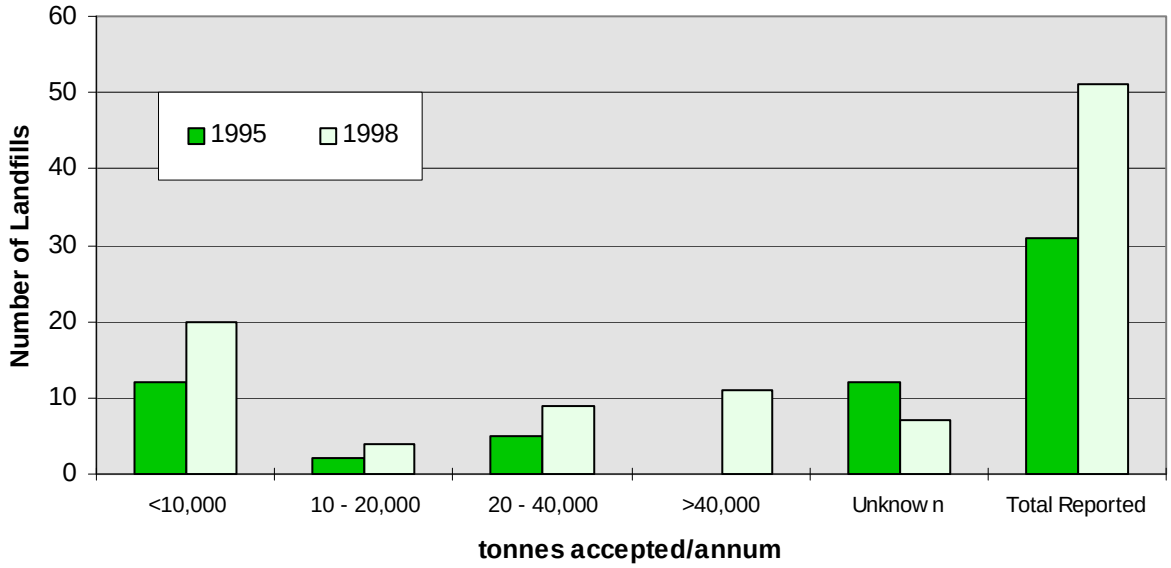


Figure 4.4: Comparison of the Relative Size and Number of Industrial/Private Landfills in Ireland in 1995 and 1998

Map 7 (Appendix C1) presents a comparison between landfill status in 1995 and 1998. Of the 118 landfills reported to be active in 1995, twenty-seven closed between 1995 and 1998, sixteen of which were local authority landfills. However, between 1995 and 1998, an additional thirty five landfills have either opened or

have come to the attention of local authorities or the Agency. These include on-site industrial landfills at IPC licensed facilities.

Key developments in landfilling since 1995 include the introduction of an integrated licensing system for landfilling under the Waste Management Act and the publication of guidance by the EPA under the Environmental Protection Agency Act on all aspects of landfilling from investigations to design, environmental monitoring and operational practices, through to closure and aftercare. Prior to the establishment of the EPA, little attention was paid to the operation and management of landfills in Ireland. Standards were low and landfilling had a deservedly poor reputation, particularly amongst communities that lived close to landfill facilities.

The developments mentioned above are leading to radical changes in landfilling practice in Ireland. The main change is probably the acceptance that landfilling must be conducted to a considerably higher standard than heretofore and that this means considerably greater investment in staff training and facility management. Landfill technology is well developed and the principal challenge in Ireland is ensuring that high operating standards become the norm so that landfills are operated in a manner that will not result in environmental pollution and general nuisance to local communities.

By 31st December 1999, 73 applications for licences for landfills under the Waste Management Act had been received by the EPA with 14 licences granted and a further 8 proposed determinations issued. For the EPA to consider an application, an applicant must supply it with specified information. Information is required on all the following:

- location of facility;
- amount and types of waste to be disposed of, both annual inputs and a total figure;
- existing environment, including details on air quality, climate, cultural heritage, ecology, human beings, hydrogeology, landscape, noise and surface water;
- site design, including infrastructure, liner system, leachate and landfill gas management, and the capping system;
- waste acceptance and handling procedures;
- environmental nuisances and how these will be handled;
- restoration and aftercare;
- environmental impacts which may be caused by the facility and the proposed mitigation measures to deal with these impacts;
- management plans;
- environmental monitoring, including details of what will be monitored, where and how often and what will be done with the results;
- contingency arrangements in case of accidents; and
- how various statutory requirements, such as the provision of financial guarantees, will be met.

When the EPA receives an application, containing all the information required, an assessment is carried out. Further information and investigations are requested if considered necessary. A decision is made by the EPA following detailed consideration of the information received. The application may be refused, granted, or granted with conditions. The types of conditions which the EPA shall or may impose are listed in the Waste Management Act, 1996.

All landfills granted a licence will have to be engineered to standards that will ensure the protection of the surrounding environment. Landfill operators will have to provide sufficient resources and trained staff to ensure that the required standards are maintained. The Waste Management Act provides for stiff fines and penalties to be applied by the courts, if licence conditions are not met.

OPERATIONAL PRACTICES

Data was collected on a number of characteristics which act as indicators of the quality of site operations and site management. These include details on monitoring carried out, control of rodents and birds, record keeping in relation to waste received including waste delivered by the public, leachate collection and testing and the presence or absence of site management plans and site closure plans.

Improvements in almost all of these indicators have been noted. Increasing numbers of weighbridges is leading to a general improvement in the quality of information being collected on waste landfilled. Facilities where weighbridges have been installed since 1995 include Powerstown in Carlow, Doora in Clare, Basketstown in Meath, Killegar in Wicklow, Ballyguyroe and Rossmore in Cork, Ballinasloe in Galway, Dunmore in Kilkenny, Drogheda in County Louth, Roscommon and Ballaghaderren in County Roscommon, Ballaghveny in Tipperary North Riding, Killurin in Wexford, Ballydonagh and Marlinstown in Westmeath, Gortadroma in Limerick, Derryclure in Offaly, Scotch Corner in Monaghan and Authurstown (Kill) in County Kildare.

Table 4.7 summarises these characteristics and compares the findings of the 1995 survey with the 1998 survey. While this provides an admittedly crude comparison between operational practices in 1995 and 1998, it does show overall improvement in important areas such as environmental monitoring, leachate testing and measurement and recording of waste received.

Table 4.7: Summary of Operational Practices Characteristics: 1995 and 1998

	1998			1995		
Characteristic	**Municipal**	**Private/ industrial**	**Total**	**Municipal**	**Private/ industrial**	**Total**
Records of waste received	60	6	**66**	62	-	**62**
Weighbridges	29	1	**30**	12	-	**12**
Surface water monitoring	53	7	**60**	25	2	**27**
Groundwater monitoring	47	4	**51**	17	4	**21**
Gas monitoring	37	1	**38**	3	0	**3**
Leachate testing	46	5	**51**	-	-	**30**
Leachate collection	23	0	**23**	-	-	**18**
Rodent control	73	3	**76**	82	6	**88**
Bird control	23	1	**24**	18	-	**18**
Daily cover availability	45	2	**47**	35	4	**39**
Site management plan	46	5	**51**	33	8	**41**
Site closure plan	46	2	**48**	23	2	**25**

4.6.2 CLOSED LANDFILLS

Information is now available on 264 landfills reported to be closed in Ireland up to the end of 1998. Of these, 18 have closed since 1995. Appendix D contains a complete list of closed landfills with a summary provided in Table 4.8.

Table 4.8: Summary of Closed Landfill Sites (December 1998)

Authority	Number of Closed Landfills
Carlow County Council	3
Clare County Council	3
Cork County Council	27
Donegal County Council	4
Dublin Corporation	17
Dun Laoghaire-Rathdown C.C.	9
Fingal County Coun	1
Fingal County Council	49
Galway Corporation	1
Galway County Council	10
Kerry County Council	9
Kildare County Council	13
Kilkenny County Council	4
Laois County Council	5
Leitrim County Council	4
Limerick Corporation	2

Authority	Number of Closed Landfills
Limerick County Council	2
Longford County Council	9
Louth County Council	9
Mayo County Council	7
Meath County Council	8
Monaghan County Council	3
Offaly County Council	6
Roscommon County Council	3
Sligo County Council	2
South Dublin County Council	2
Tipperary N.R. Co. Co.	6
Tipperary S.R. Co. Co.	3
Waterford County Council	3
Westmeath County Council	5
Wexford County Council	22
Wicklow County Council	13
TOTAL	**264**

4.7 LICENSED AND PERMITTED ACTIVITIES

The Waste Management Act provides for the regulation and control of recovery and disposal of waste in Ireland. The Act requires that the EPA license all significant waste disposal and recovery activities. The licensing system is an integrated system, meaning that all aspects of the activity that might give rise to environmental pollution are controlled by the conditions attached to the licence. This means that the licence is designed to protect all environmental media including air, water and soil. A principal objective of the licensing system is to ensure that waste activities such as landfills, transfer stations, hazardous waste facilities and recycling depots are operated in such a way that they do not cause environmental pollution. The EPA cannot grant a licence unless it is satisfied that the activity is not causing environmental pollution, when operated in accordance with conditions set by the EPA.

Licensing commenced in May, 1997. Facilities requiring a licence include landfill sites, transfer stations, storage facilities, hazardous waste disposal and recovery facilities, large composting facilities and certain types of treatment facilities. The system is being introduced on a phased basis and dates have been set by which time operators of both public and private waste disposal and recovery activities of specified types and sizes had to apply to the EPA for a licence. All new activities are required to obtain a licence prior to commencement of the activity.

Photograph 7: Aerial Photograph of Authurstown Landfill, Co. Kildare
(Source: South Dublin County Council)

As of the 31st December 1999, 136 applications for licences for waste facilities under the Waste Management Act had been received with 30 licences granted and a further 9 proposed determinations issued. Table 4.9 presents a summary of the types of activities for which licences have been applied for with summary information on each activity presented in Appendix C5. The geographical location of activities for which a licence application has been received by the Agency is presented in Map 8 (Appendix C1).

Waste disposal and recovery activities other than those that require a license from the EPA require a local authority permit or a certificate of registration. The activities requiring waste permits include the recovery of scrap metal or other metal wastes, the dismantling or recovery of vehicles and disposal of waste, other than landfill, at facilities where the annual intake does not exceed 5,000 tonnes per annum. Permitted activities notified to the Agency at time of going to press are listed in Appendix C6. Some specific waste streams are exempted from control under the Waste Management Act including dumping at sea and the management of radioactive wastes, as their control is provided for under other enactments.

Table 4.9: Summary of Waste Licence Applications Received and Licences Granted up to 31st December 1999

Facility Type	Total	Local Authority applications	Private Sector applications	Proposed Decisions	Licences issued	Abandoned
Landfill	71*	56	15	8	13	
Transfer Station	29	8	21	1	6	
Composting	7		7			
Hazardous Waste Treatment & Transfer	7		7		1	
Healthcare Risk Waste Treatment	6	2	4		3	2
Soil Remediation	4		4		1	
Hazardous Waste Transfer Station	3		3		2	
Integrated Waste Management Facilities	3	2	1		1	
Dredging	2	1	1		1	
Hazardous Waste Treatment	2		2		1	
Healthcare Risk Waste Treatment & Hazardous Waste Transfer Station	1		1		1	
Recovery	1	1				
TOTAL	**136**	**70**	**66**	**9**	**30**	**2**

*Integrated waste management facilities can include a landfill facility. Of the three integrated wastemanagement facilities, two include landfill.

5. TRENDS AND INDICATORS

5.1 OVERVIEW

An overview of trends in estimated waste arisings for 1995 and 1998 is presented in Figure 5.1. Overall, non-agricultural waste arisings are estimated to have increased from 11,253,300 tonnes in 1995 to 15,433,954 tonnes in 1998, an increase of 37.2% in three years. The sectors in which the most significant increases have been recorded are manufacturing, mining, and construction & demolition waste. Municipal waste arisings are estimated to have increased by 11.3% in the same period. Hazardous waste arisings for 1998 are estimated to be 370,328 tonnes compared with a best estimate for 1996 of 327,862 tonnes, as reported in the Proposed National Hazardous Waste Management Plan. Agricultural waste arisings are now estimated to be in the region of 64.6 million tonnes per annum.

These increases appear to be a function of both economic growth during the period and considerably improved reporting of information.

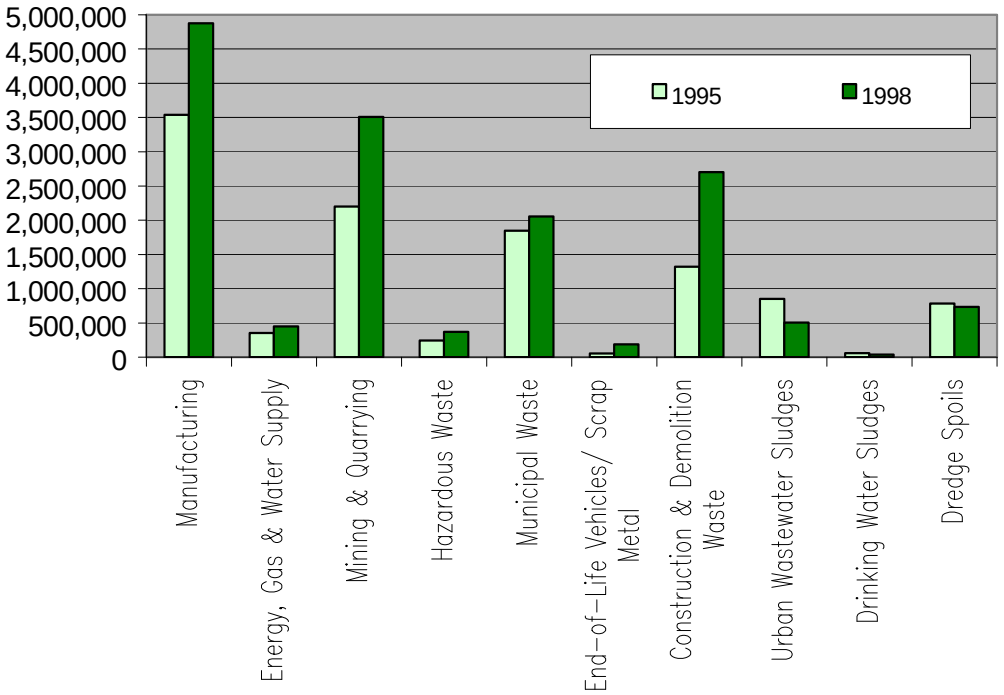


Figure 5.1 Trends in Non-Agricultural Waste Arisings; 1995 and 1998

5.2 MUNICIPAL WASTE

5.2.1 ARISINGS

A summary of trends between 1995 and 1998 for municipal waste arisings is presented in Table 5.1. In 1995, total municipal waste arisings were estimated to be 1,848,232 tonnes. This compares with a best estimate in 1998 of 2,056,652 tonnes, consisting of 1,220,856 tonnes of household waste, 754,797 tonnes of commercial waste and 80,999 tonnes of street cleansing waste. Overall, municipal waste arisings are estimated to have increased by 11.3% over the three year period, an annual increase of 3.8%.

Table 5.1: Summary of Estimated Municipal Waste Arisings in 1995 and 1998

	Household	Commercial	Street Cleansing	Total
	(tonnes/annum)			
1995	1,324,521	476,920	46,791	1,848,232
1998	1,220,856	754,797	80,999	2,056,652

While there is an apparent reduction in the quantities of household waste arising, it is more likely that the 1998 figure is simply a more accurate reflection of the actual quantities arising as the difference between reported quantities collected and estimated quantities arising is considerably less for 1998 than for 1995.

Trends in household and commercial waste collected for management are illustrated in Figure 5.2. There is an overall increase in household and commercial waste reported to be collected for management of 23.2% in the three-year period, from 1,503,171 tonnes to 1,852,450 tonnes. The quantity of household waste reported to be collected for management has increased by 13.3% during the period while commercial waste reported to be collected for management has increased by 44.5%.

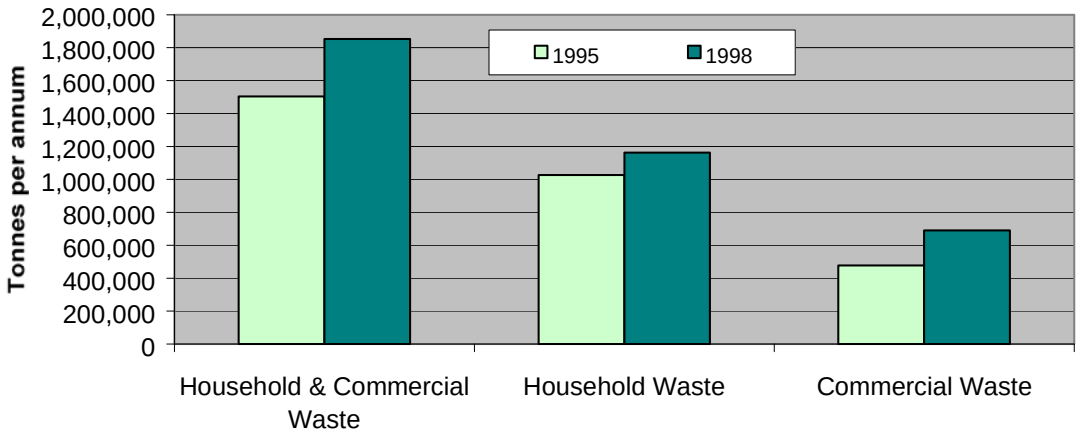


Figure 5.2 Trends in Household and Commercial Waste Collected for Management: 1995 & 1998

5.2.2 DISPOSAL AND RECOVERY ROUTES

Information on disposal and recovery routes is available for waste collected. In 1998, it is estimated that 1,852,450 tonnes of household and commercial waste were collected for either disposal or recovery. Of this, 1,685,766 tonnes were consigned to landfill with 166,684 tonnes recovered. This compares with 1,385,439 tonnes landfilled in 1995 and 117,732 tonnes recovered, as illustrated in Figure 5.3. The national recovery rate for household and commercial waste collected for management in 1998 is estimated to be 9.0% compared with 7.8% in 1995.

In Figure 5.4, trends in the management of the household waste stream and the commercial waste stream are presented. For household waste, there has been a 14.7% increase in the quantity of waste reported landfilled, with a reduction in the recovery rate from 4.3% in 1995 to 3.2% in 1998. For commercial waste, there has been a 38.7% increase in the quantity reported landfilled and an increase in the recovery rate from 15.3% in 1995 to 18.7% in 1998.

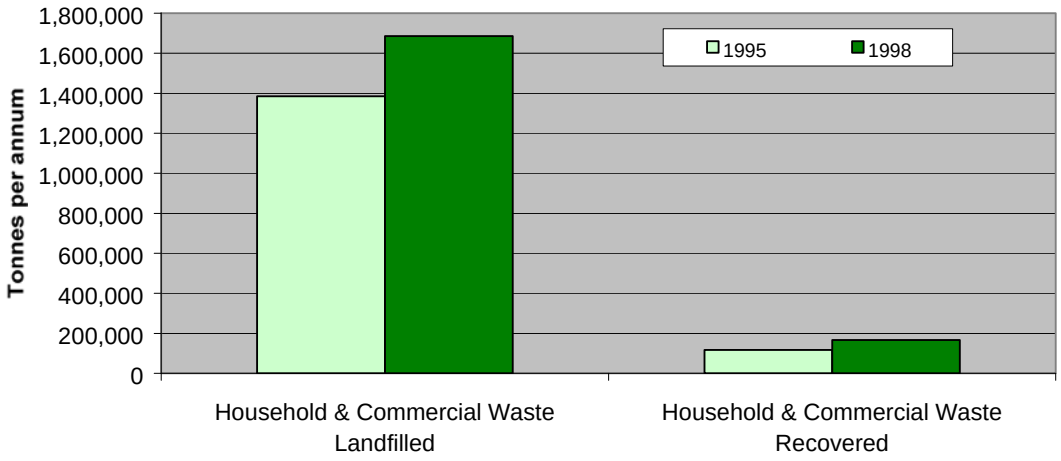


Figure 5.3: Trends in Disposal and Recovery of Household & Commercial Waste - 1

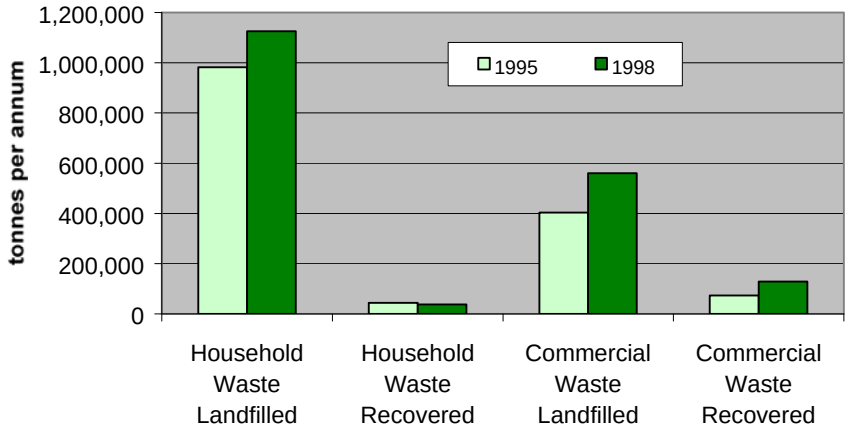


Figure 5.4: Trends in Disposal and Recovery of Household & Commercial Waste - 2

5.2.3 KEY TRENDS

The key trends in relation to municipal waste are:

- continuing growth in quantities arising; the quantity of household and commercial waste reported to be collected for management increased by 23.2% between 1995 and 1998, suggesting an annual increase of 7.7%. This increase is partly a function of improved data collection and reporting. Overall, the best estimate of quantities of municipal waste arising, which accounts for households not served with collection services, suggests an increase over the three year period of 11.3%, or an annual increase of 3.8%.

- continuing increases in the quantities of household and commercial waste reported to be landfilled, up from 1,385,439 tonnes in 1995 to 1,685,766 tonnes in 1998, an increase of 21.7% in the three year period, or an annual increase of 7.2%.

- an increase in the overall quantity of municipal waste reported to be recovered with the overall recovery rate increasing from 7.8% in 1995 to 9.0% in 1998. Recovery activity is predominantly in the paper and glass sectors, which together account for 78.2% of the total quantity reported to be recovered.

- continuing poor performance in relation to the recovery of household waste; the recovery rate for household waste is estimated to be 3.2% for 1998, down from 4.3% in 1995. This is mainly due to a large decrease in the collection of paper waste from households. In contrast, recovery of glass from households has improved considerably and has increased from 7,905 tonnes in 1995 to 14,100 tonnes in 1998. There has also been significant activity in the recovery of batteries.

5.3 PACKAGING WASTE

5.3.1 ARISINGS

The best estimate of total packaging waste arisings for 1998 is 682,688 tonnes. This is based on an analysis of information obtained from the various surveys conducted and includes estimated arisings from both municipal and industrial sectors. Trends in the packaging content of the household and commercial waste stream, which accounts for the greater part of the packaging waste stream, and, as pointed out in section 3.4.3, includes waste from industrial sources, are presented in Figure 5.5. The packaging content of this stream is now estimated to be 675,043 tonnes. This compares to estimates of 435,372 tonnes in 1995 and 403,995 in January 1994. The large increase in estimated household and commercial waste packaging arisings results from a combination of increases in reported household and commercial waste arisings and increases in the estimated packaging content of these streams, in particular the commercial waste stream for which more information is available for 1998 than previously was the case (see section 3.4.2 for further details).

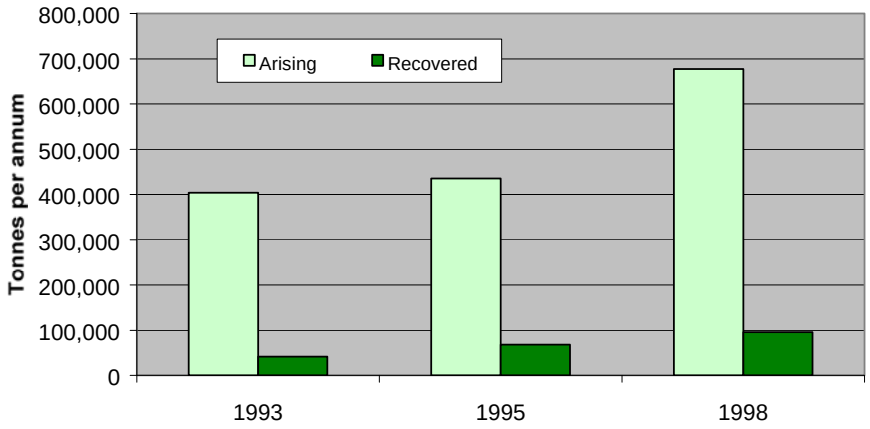


Figure 5.5: Trends in Quantities of Packaging Waste Arising and Recovered in the Household and Commercial Waste Stream: 1993 - 1998

In general, the quality of information on packaging arisings is continuing to improve. It is likely that the increase in estimated arisings since 1995 is due in part to improved data collection and reporting. This particularly applies to quantities of commercial waste going to landfill. In addition, REPAK is now well established and it can be anticipated that REPAK will be providing national authorities with comprehensive information on packaging placed on the market, packaging waste arisings and disposal/recovery routes for its member companies for calendar year 1999 and following years. This, together with similar information from local authorities on companies registered with them, is anticipated to make a significant contribution to information on this important waste stream. As has been highlighted elsewhere in this report, there is a need for more comprehensive compositional surveying of the commercial waste stream to improve the quality of information on the packaging content of this waste stream. There is also a need for further work to define more precisely the origin of non-household packaging waste.

5.3.2 DISPOSAL AND RECOVERY ROUTES

Figures 5.6 and 5.7 provide a summary of trends in the disposal and recovery of the various components of the household and commercial packaging waste stream since 1993. As can be seen, the bulk of recovery occurs in the paper and glass sectors with recovery rates at a low level for other materials. There has been

steady growth in the recovery of both paper and glass. It is noteworthy that the recovery rate for aluminum packaging has dropped dramatically.

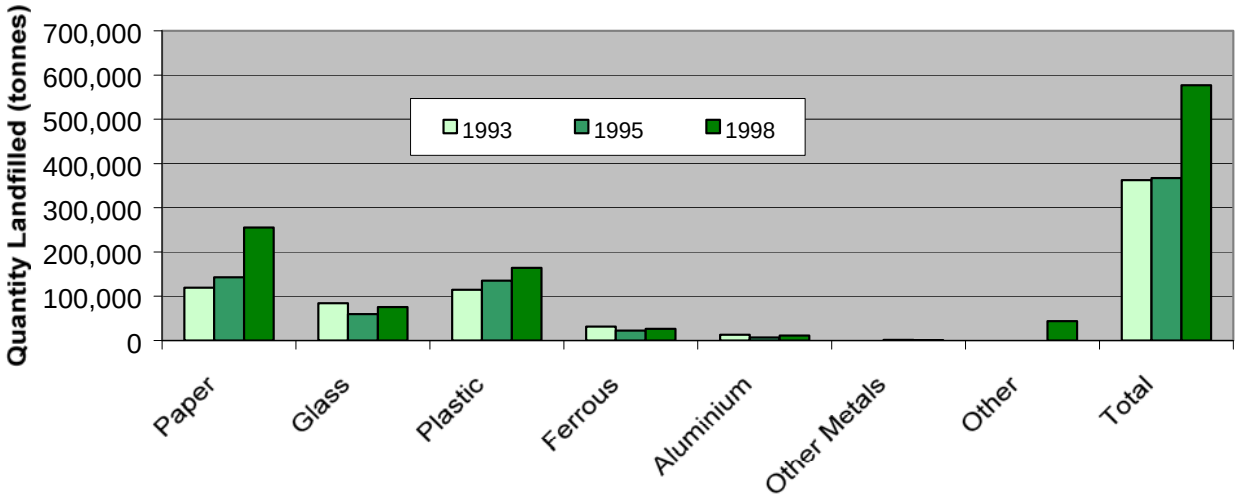


Figure 5.6: Trends in Disposal of Packaging Waste in the Household & Commercial Waste Stream: Quantities Landfilled 1993 - 1998

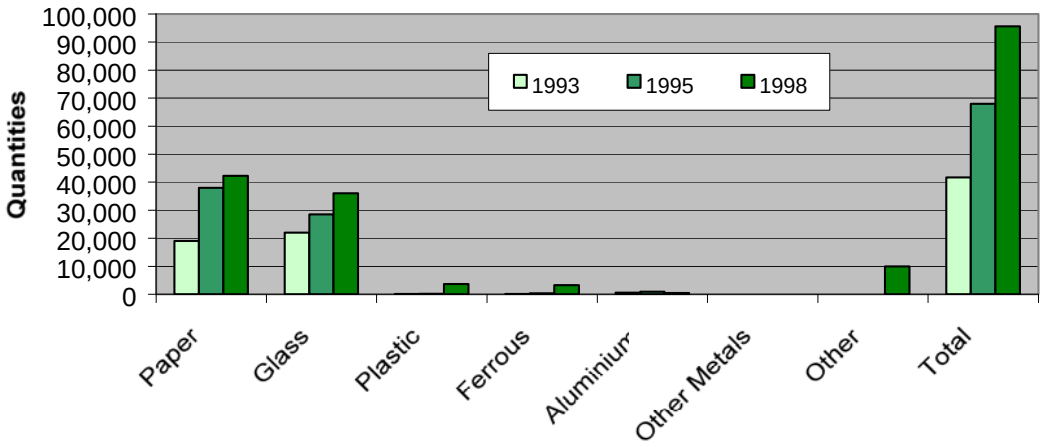


Figure 5.7: Trends in Recovery of Packaging Waste in the Household & Commercial Waste Stream: Quantities Recovered 1993 - 1998

Figure 5.8 presents a summary of the overall recovery rate for the country for both the household and commercial waste stream for 1993, 1995 and 1998 and the total waste stream for 1998, together with the targets set by the Packaging Directive. The recovery rate for the household and commercial waste stream increased from 10.3% in 1993 to 15.6% in 1995 and is now estimated to be 13.8%. The best estimate for recovery within the total packaging waste stream is 14.8%. While there has been an increase in the overall quantities of packaging waste reported to be recovered by recycling organisations, from an estimated 67,967 tonnes in 1995 to an estimated 93,259 tonnes in 1998, this has been off-set by the corresponding increase in packaging waste landfilled. Based on the results of waste composition analyses of both the household and

commercial waste streams, it is estimated that 581,784 tonnes of packaging waste was landfilled in 1998. This consists of 295,817 tonnes arising from the household waste stream and 285,967 tonnes from the commercial waste stream, some of which is thought to arise from industrial sources.
As stated in chapter 3, if the total estimated arisings remain at their current level of 682,688 tonnes, to meet the target of 25% recovery by June 2001 will require that total tonnage's recovered increase to over 170,000 tonnes per annum, compared with a current estimated tonnage recovered of 100,905 tonnes.

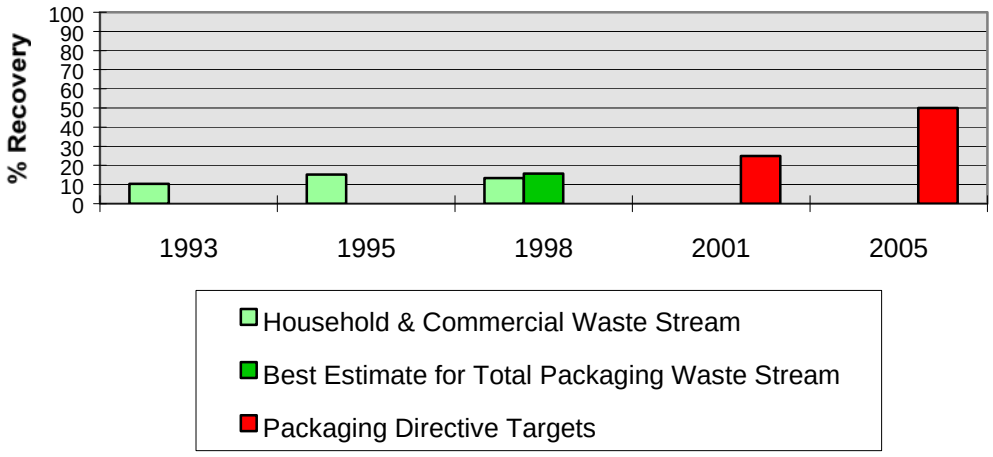


Figure 5.8: Trends in Recovery of Packaging Waste In Ireland: 1993 - 1998

5.3.3 KEY TRENDS

The key trends in relation to packaging waste are:

- a continuing increase in the total estimated quantity arising, with a best estimate of 682,688 tonnes for 1998;
- a continuing increase in the quantity of packaging waste recovered, with a best estimate of 100,905 tonnes in 1998;
- as with general household and commercial waste, continuing low levels of recovery in the household waste stream with the recovery rate estimated at 5.6% for household waste compared with 21.0% for the commercial waste stream and 52% for industrial waste.

5.4 INDUSTRIAL WASTE

5.4.1 ARISINGS

Trends in estimated industrial waste arisings between 1995 and 1998 are presented in Figure 5.9. Total industrial waste arisings are estimated to have increased from 6.2 million tonnes in 1995 to 9.1 million tonnes in 1998, an increase of 47% in three years. It is difficult to establish the degree to which this increase is a real increase or a function of improved reporting. The majority of the large to medium sized mining and manufacturing companies are now controlled through the Integrated Pollution Control licensing system which is resulting in considerably improved information on waste quantities arising and this is certainly a factor in the increase in quantities observed. There is also convergence between reported quantities and projected quantities, as illustrated in Figure 5.10 for the manufacturing sector. This convergence is due to the higher survey response rate for 1998 and the fact that most of the high volume waste producers in the country participating in the survey.

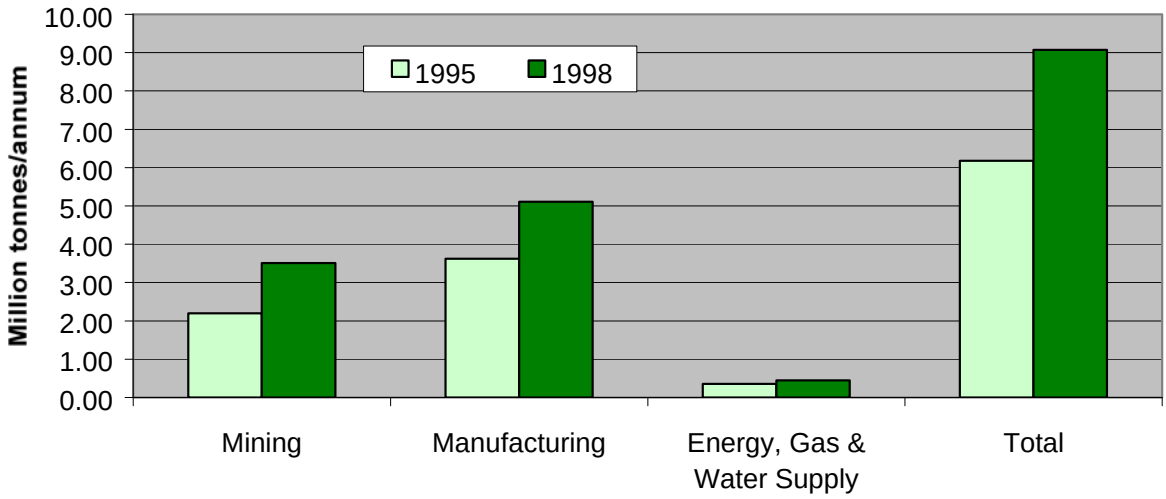


Figure 5.9: Trends in Industrial Waste Arisings

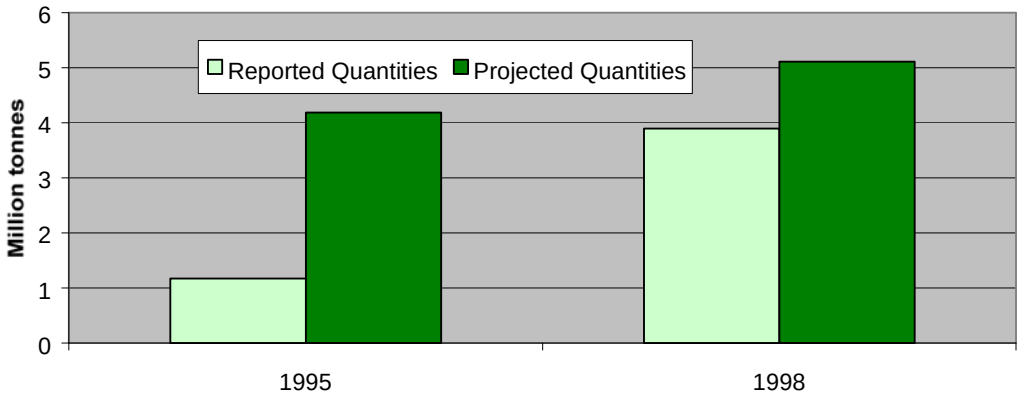


Figure 5.10: Comparison of Reported and Projected Arisings for the Manufacturing Sector in 1995 and 1998

5.4.2 DISPOSAL AND RECOVERY ROUTES

Trends in disposal and recovery of industrial waste are illustrated in Figures 5.11 and 5.12. As can be seen from Figure 5.11, along with the overall increase in quantities reported to be arising, there is also a significant shift towards recovery, with the overall recovery rate increasing from 12.4% to 26.6%. The bulk of this change is occurring in the manufacturing sector, as illustrated in Figure 5.12, where the overall recovery rate for reported waste has increased from 31.2% in 1995 to 51.4% in 1998. In waste tonnage terms, this equates to an increase in reported recovery from under half a million tonnes in 1995 to over 2 million tonnes in 1998.

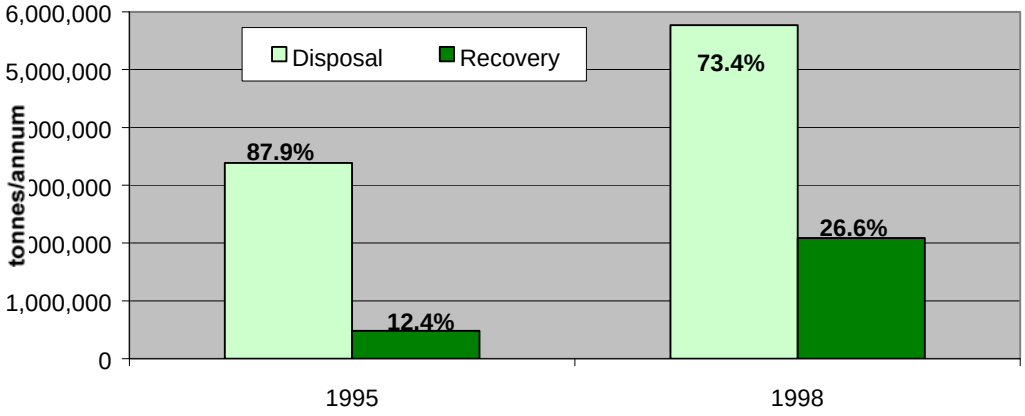


Figure 5.11: Trends in Disposal and Recovery Rates for Reported Industrial Waste

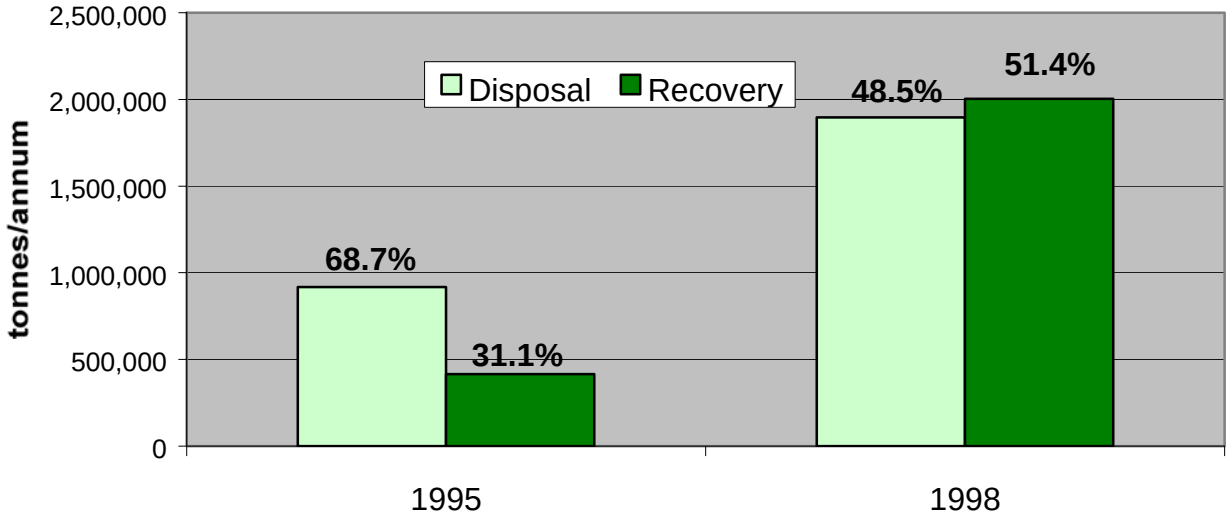


Figure 5.12: Trends in Disposal and Recovery Rates for Manufacturing Waste

Landfill remains the most common disposal route, accounting for 67.9% of all industrial waste treated. However, it should be noted that two sites account for 3.2 million tonnes of the total quantity landfilled. The main recovery routes are re-use, landspreading and the recovery of organic materials.

5.4.3 KEY TRENDS

The key trends in relation to industrial waste are:

- a continuing increase in the quantities of industrial waste, mainly due to improved reporting of information, with a best estimate for 1998 of 9,074,751 tonnes;

- a significant increase in reported recovery of industrial waste, rising from an estimated 12.4 % in 1995 to 26.6% in 1998;
- a significant increase in reported recovery of waste from the manufacturing sector, rising from an estimated 31% in 1995 to 51.4% in 1998.

5.5 HAZARDOUS WASTE

5.5.1 ARISINGS

Hazardous waste arisings are estimated to have increased from 327,862 tonnes in 1996 to 370,328 tonnes in 1998, an increase of 12.9% or about 6.4% per annum. Of perhaps greater significance is the increase in reported hazardous waste arisings from 229,634 tonnes in 1996 to 296,017 tonnes in 1998, and the corresponding decrease in 'unreported' hazardous waste from 98,228 tonnes in 1996 to 74,311 tonnes in 1998.

5.5.2 DISPOSAL AND RECOVERY ROUTES

There have been some significant changes in the management of hazardous wastes between 1996 and 1998, with some key trends illustrated in Figure 5.13. The most notable changes are the increase in export of hazardous waste from 51,727 tonnes in 1996 to 99,598 tonnes in 1998, and shifts in the final destination of these wastes. In 1996, 84.9% of Ireland's exported hazardous waste was exported to the United Kingdom compared with 33.4% in 1998. This is mirrored by an increase in export to mainland Europe with Holland, Germany and Belgium, collectively, receiving 54.8% of Ireland's exported hazardous waste in 1998, compared with 5.4% in 1996. This increase in export means that the domestic treatment rate, being the percentage of total reported arisings managed in Ireland, has fallen from 77% in 1996 to 59% in 1998. There has also been a decrease of about 6.6% (9,418 tonnes) over the two years in reported on-site treatment and an increase of 16.6% (6,051 tonnes) during the same period in reported domestic off-site treatment.

Figure 5.13: Trends in the Management of Hazardous Waste, 1996 and 1998

A key indicator identified in the Proposed National Hazardous Waste Management Plan is the quantity of hazardous waste disposed of, with a recommendation that a prevention target for the plan be no increase in hazardous waste disposal over 1996 quantities. Disposal trends are illustrated in Figure 5.14. As can be seen, the total quantity of hazardous waste disposed of has increased from 86,754 tonnes in 1996 to 120,354 tonnes in 1998, an increase of 38.7% in two years[2]. There has been an increase of 83.3% in the quantity of waste disposed of abroad, with reported quantities disposed of through thermal treatment abroad increasing

[2] This includes an increase in total incineration (i.e. domestic and abroad) from 45,964 tonnes in 1996 to 65,631 tonnes in 1998. It is not clear how much of this waste is being incinerated at facilities that are equipped for energy recovery. More complete information on the final destinations of these wastes may lead to a revision of this figure.

from 18,880 tonnes in 1996 to 47,751 tonnes in 1998. Domestic disposal has increased from 59,385 tonnes in 1996 to 69,839 tonnes in 1998, an increase of 17.6%.

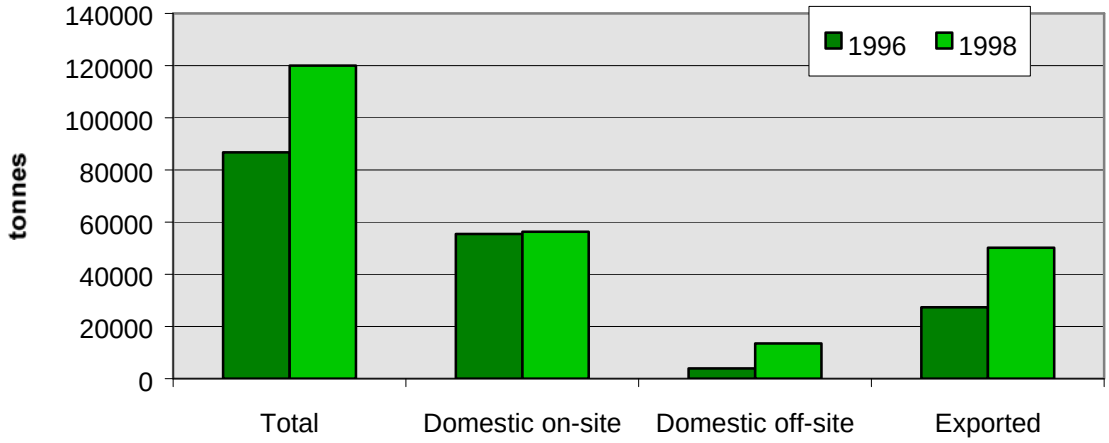


Figure 5.14: Disposal Rates for Reported Hazardous Waste Arising in Ireland: 1996 and 1998

This trend illustrates the challenges ahead in relation to hazardous waste and the implementation of the National Hazardous Waste Management Plan.

Figure 5.15 illustrates corresponding trends in relation to recovery of reported hazardous waste. The total quantity reported to be recovered has increased from 138,969 tonnes in 1996 to 152,583 tonnes in 1998, an increase of 9.8%. The slight decrease in waste recovered on-site is off-set by the increase in waste recovered abroad.

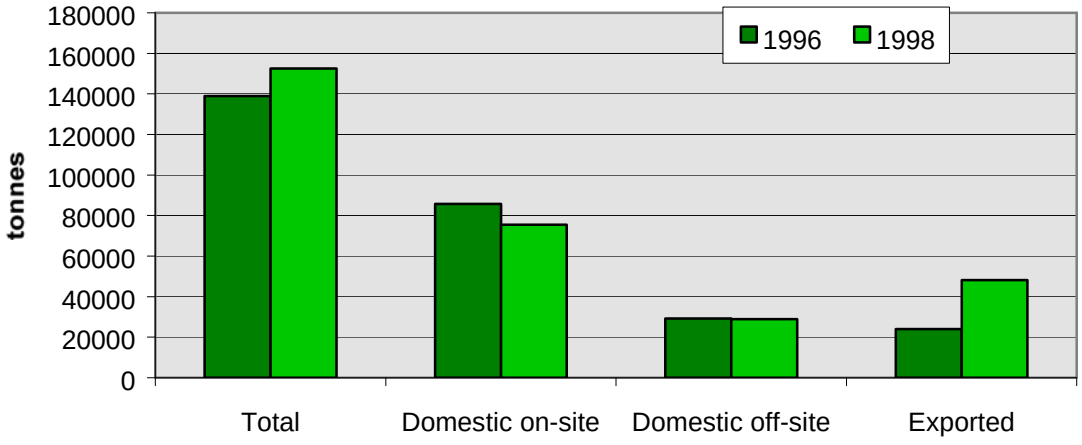


Figure 5.15: Recovery Rates for Reported Hazardous Waste Arising in Ireland: 1996 and 1998

5.5.2 KEY TRENDS

The key trends in relation to hazardous waste are:

- A continuing increase in the quantities being generated, with an overall increase of 13.0 % in two years;
- Decreasing quantities of unreported hazardous waste indicating improved data collection;

- An upward trend in quantities of hazardous waste exported, with an increase of 92.5% over the past two years;
- An upward trend in the quantities of reported hazardous waste disposed of, with an overall increase from 86,754 tonnes in 1996 to 120,354 tonnes in 1998.
- An upward trend on the quantities of reported hazardous waste recovered, with an overall increase from 138,969 tonnes in 1996 to 152,583 tonnes in 1998.

5.6 WASTE MANAGEMENT FACILITIES

The main trends in waste management infrastructure are presented in Chapter 4. In summary, in relation to municipal waste, there remains an over reliance on landfill as the method of treatment although the number of active local authority landfills in starting to decrease and has fallen from 87 in 1995 to 76 in 1998 with a best estimate of 50 at time of going to press. It is clear from information about the remaining life-span of landfills in Ireland, which is presented in Figure 4.9, that many local authorities are running low on capacity with 25 of the 50 landfills currently in operation expected to close within the next five years. The most radical change in relation to large waste facilities since 1995 is the introduction of a comprehensive integrated licensing system under the Waste Management Act which is resulting in considerable investment in infrastructure to meet the stringent requirements of the licence conditions set by the EPA.

In relation to recovery of municipal waste, the growth in the number of bring banks throughout the country is encouraging along with the overall increase in gross quantities reported to be recovered. However, in relation to municipal waste, the only conclusion that can be arrived at is that Ireland, in 1998, remains overly reliant on landfill and that considerable progress is required to arrive at a point where the necessary infrastructure is available to provide an integrated waste management system for the country.

5.7 INDICATORS

5.7.1 MUNICIPAL WASTE

A set of indicators for municipal waste was recommended in National Waste Database Report, 1995. Values for 1998 are presented in Table 5.2, together with equivalent figures, where available, for 1995. Indicators for packaging waste and biodegradable waste have also been included, along with indicators for local authority landfills and bring banks.

The indicators show overall increases in quantities of waste produced per capita. The quantity of municipal waste collected per person per annum has increased from 0.44 tonnes in 1995 to 0.53 tonnes in 1998, with household waste collected per person per annum increasing from 0.29 to 0.32 tonnes in the same period. The overall recovery rate for the household and commercial waste stream has increased; however, the recovery rate for the household waste stream remains low and has fallen from 4.3% to 3.2%.

Indicators are listed for the packaging waste stream with the key indicator being the National Recovery Rate, estimated to be 14.8% for 1998.

A new indicator for the biodegradable content of waste being landfilled is introduced, as a result of the targets set out by the Landfill Directive for reduction in biodegradable waste going to landfill. The best estimate for 1998 is that 59.5% of household and commercial waste being landfilled is biodegradable, using the definition that applies in the Landfill Directive. Indicators for construction and demolition waste are presented in Table 5.5.

5.7.2 INDUSTRIAL WASTE

Table 5.3 presents a list of indicators for industrial waste with values provided for both 1995 and 1998.

5.7.3 HAZARDOUS WASTE

Indicators for hazardous waste for 1996 and 1998 are presented in Table 5.4. The indicators are those recommended in the Proposed National Hazardous Waste Management Plan.

5.8 CONCLUSIONS AND RECOMMENDATIONS

The 1998 surveys suggest a continuing increase in waste quantities arising in Ireland although the degree to which these increases are real or a function of improved reporting is not altogether clear. Several factors have contributed to improved data collection and reporting since 1995. These factors include the preparation of waste management strategy studies and waste management plans by local authorities, the growth in the number of companies controlled through the Integrated Pollution Control licensing process, the introduction of Waste Licensing and the preparation of the Proposed National Hazardous Waste Management Plan. The impact of these factors is reflected in improved information from both local authorities and industry. However, there is still considerable scope for further improvement, both in the recording of waste quantities and the tracking of waste flows so that comprehensive and reliable information on waste becomes routinely available at both local and national level.

A key immediate priority for waste planning in Ireland is that local authorities develop the capacity to track waste flows within their functional areas so that they know what types and quantities of waste are arising in their areas, how much of each type is being exported out of and imported into their functional area, how much of each type is being managed within their functional area and, finally, the routes by which these wastes are being managed. Local authorities should establish specific programmes for tracking waste flows within their functional area or, where waste planning is being conducted at regional level by one or more local authorities, within the region. These programmes should form the foundation for a comprehensive waste information system in Ireland.

At national level, there is a need for continuous revision and updating of information on waste so that policy making and waste management planning is being conducted in an informed manner. While national reports will continue to be published at three yearly intervals following repeats of the national surveys, specific sectoral and special interest reports will be required in the intervening years. In this respect, waste streams that require more detailed immediate attention at national level include: Commercial Waste, Packaging Waste, Biodegradable Waste, Construction and Demolition Waste, End of Life Vehicles, and Waste from Electrical and Electronic Equipment.

In relation to commercial waste, there is an urgent need for more comprehensive analysis of the waste stream and a national study to characterise the waste stream is recommended. To date, only four commercial waste composition surveys have been conducted in Ireland which is in marked contrast to the many surveys that have been conducted on household waste. Improved information on the packaging content of the commercial waste stream is of particular importance as this has a direct impact on the estimation of total packaging waste arisings in the country and the national recovery rate for packaging waste. In relation to biodegradable waste, the Landfill Directive imposes targets and a timeframe for reducing the quantities of biodegradable waste going to landfill. A national strategy to meet these targets is required which should be based on a thorough understanding of the current position in relation to the waste stream and the various options available in relation to its management. In relation to the three other waste streams mentioned, considerable information gaps exist. Comprehensive baseline and projection information is required for each waste stream so that existing and planned recovery targets for the waste streams can be considered and planned for in an informed manner.

Ireland is no longer a low-volume waste producing country. As our economy grows and more goods and services are consumed, the inevitable consequence is that more waste is being produced, particularly post-consumer waste. The relative absence of existing infrastructure for separate collection and recovery of wastes such as household wastes, commercial wastes, construction and demolition waste and waste from electrical and electronic equipment means that materials and energy that could be usefully recovered from these waste streams are being discarded, mainly to landfills. There is therefore an urgent need for the necessary infrastructure to be put in place for the separate collection, recovery and safe disposal of waste so that a truly integrated approach to waste prevention and management becomes standard practice in Ireland. More emphasis is also required on waste prevention and waste minimisation, particularly in relation to post-consumer waste. Continuing and high profile public awareness programmes are required so that the issue of both producer and consumer responsibility for waste prevention remains high on the agenda.

Table 5.2: Recommended Indicators for Municipal Waste

INDICATOR	1995	1998
MUNICIPAL WASTE		
Municipal Waste collected/person/annum,	0.44 tonnes	0.53 tonnes
Municipal Waste arising/person/annum,	0.52 tonnes	0.56 tonnes
Disposal Rate for Household & Commercial Waste Collected	92.2 %	91.0%
Recovery Rate for Household & Commercial Waste Collected	7.8 %	9.0 %
Number of Active Local Authority Landfills	87	76
Number of Bring Banks	426	837
HOUSEHOLD WASTE		
Household waste collected/person/annum,	0.29 tonnes	0.32 tonnes
Household waste arising/person/annum,	0.38 tonnes	0.33 tonnes
Disposal Rate for Household Waste Collected	95.7%	97.3%
Recovery rate for Household Waste Collected	4.3%	3.2%
COMMERCIAL WASTE		
Commercial waste collected/person/annum	0.14 tonnes	0.19 tonnes
Disposal Rate for Commercial Waste Collected	84.7%	81.3%
Recovery Rate for Commercial Waste Collected	15.3%	18.7%
PACKAGING WASTE		
Best Estimate of Total Quantity Arising (tonnes)		682,688 tonnes
Packaging Waste Arisings/person (tonnes/annum)		0.184 tonnes
Best Estimate of Total Recovered (tonnes/annum)		100,905 tonnes
Packaging Waste Recovered/person (tonnes)		0.027 tonnes
National Recovery Rate (best estimate for total packaging waste stream)		14.8%
Household and Commercial Packaging Arisings (tonnes)	435,372 tonnes	675,043 tonnes
Recovery Rate for Household & Commercial Waste Stream	15.6%	13.8%
Recovery Rate for Household Waste Stream		5.6%
Recovery Rate for Commercial Waste Stream		21.0%
BIODEGRADABLE WASTE LANDFILLED		
Biodegradable Content of Municipal Waste Landfilled (kitchen, garden and paper wastes)	62.6%	59.5%
Biodegradable Content of Municipal Waste Landfilled excluding paper wastes	31.9%	27.0%

Table 5.3: Recommended Indicators for Industrial Waste

INDICATOR	1995	1998
INDUSTRIAL WASTE[3]		
Best Estimate of National Arisings	6,184,791	9,074,751
Total Quantity Reported to be Recovered	480,766	2,088,111
National Recovery Rate for Reported Industrial Waste	12.4%	26.6%
Total Quantity Reported to be Disposed	3,387,215	5,771,166
National Disposal Rate for Reported Industrial Waste	87.6%	73.4%
National Recovery Rate for Reported Manufacturing Waste	31.2%	51.4%

Table 5.4: Recommended Indicators for Hazardous Waste

HAZARDOUS WASTE		
	1996	**1998**
Best Estimate of National Arisings	327,862	370,328
Estimated Quantity of Reported Hazardous Waste	229,634	296,017
Estimated Quantity of Unreported Hazardous Waste	98,228	74,311
Quantity of hazardous waste moved under local authority consignment note	Unknown	Unknown
Quantity of hazardous waste exported	51,727 24,051 recovery 27,369 disposal 307 unspecified	99,598 48,210 recovery 50,180 disposal 1,208 unspecified
Quantity of hazardous waste imported under TFS notification	0	0
Number of authorised hazardous waste recovery and disposal facilities	at least 8	at least 8
Quantity of reported hazardous waste recovered	138,969	152,583
Quantity of reported hazardous waste disposed	86,754	120,354
Domestic Treatment Rate (percentage of total reported hazardous waste treated in Ireland)	77.3%	58.9%

[3] Manufacturing, Mining and Electricity, Gas and Water Supply

Table 5.5: Recommended Indicators for Construction & Demolition Waste

INDICATOR	1995	1998
CONSTRUCTION & DEMOLITION WASTE		
Best Estimate of National Arisings	1,318,908	2,704,958
Total Quantity Estimated to be Recovered	530,000	1,171,572
National Recovery Rate	40.2%	43.3%
Total Quantity Estimated to be Disposed	788,908	1,533,386
National Disposal Rate	59.8%	56.7%

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APPENDIX A: GLOSSARY OF TERMS

(Reference to *Schedules* in definitions refer to the Waste Management Act, 1996)

Waste Any substances or object belonging to a category of waste, specified in the *First Schedule* or included in the EWC, which the holder discards or intends or is required to discard and anything which is discarded or otherwise dealt with as if it were waste shall be presumed to be waste until the contrary is proved.

Household Waste Waste produced within the curtilage of a building or self-contained part of a building used for the purposes of living accommodation.

Commercial Waste Waste from premises used wholly or mainly for the purposes of a trade or business or for the purposes of sport, recreation, education or entertainment but does not include household, agricultural or industrial waste.

Industrial Waste Includes waste produced or arising from manufacture or industrial activities or processes.

Municipal Waste Household waste as well as commercial and other waste which, because of its nature or composition, is similar to household waste.

Inert Waste Waste that, when deposited into a landfill, does not undergo any significant physical, chemical or biological transfer.

Packaging Waste Any packaging or packaging material covered by the definition of waste in Directive 75/442/EEC.

Packaging Any material, container or wrapping, used for or in connection with the containment, transport, handling, protection, promotion, marketing or sale of any product or substance including such packaging as may be prescribed.

Hazardous Waste Means- (i)hazardous waste for the time being mentioned in the list prepared pursuant to Article 1 (4) of Council Directive 91/689/EEC of 12 December, 1991, being either

(I) Category I waste that has any of the properties specified in Part III of the *Second Schedule,* or

(II) Category II waste that

(A) contains any of the constituents specified in Part II of the *Second Schedule,* (B) has any of the properties specified in Part III of the said *Schedule*,

(ii) such other waste, having any of the properties specified in Part III of the *Second Schedule*, as may be prescribed for the purposes of this definition.

Disposal In relation to waste, includes any of the activities specified in the *Third Schedule*, and waste disposal activity shall be construed accordingly.

Recovery	In relation to waste, means any activity carried on for the purposes of reclaiming or re-using, in whole or in part, the waste and any activities related to such reclamation, recycling or re-use, including any of the activities specified in the *Fourth Schedule*, and waste recovery activity shall be construed accordingly.
Recycling	The subjection of waste to any process or treatment to make it re-usable in whole or in part.
Recovery Rate	Percentage of usable recycled materials that have been removed from the total amount of waste generated in a specific area or by a specific activity.
Recycle/Re-use	Minimising waste generation by recovering and reprocessing usable products that might otherwise become waste (i.e. recycling of aluminium cans, paper bottles, etc).
Re-use	Using a product or component of municipal solid waste in its original form more than once, e.g. refilling a glass bottle that has been returned or using a coffee jar to hold nuts and bolts.
Prevention	The reduction of the quantity and of the harmfulness for the environment of waste products.
Facility	In relation to the recovery or disposal of waste, any site or premises used for such purpose.
Transfer Station	A facility where waste is unloaded in order to permit its preparation for further transport for recovery, treatment or disposal elsewhere.
Participation Rate	Percentage of the population within a catchment area of a particular waste management facility or service, actually using that facility or service.
Civic Waste Facilities (Civic Amenity Sites)	Facilities at which waste may be deposited by members of the public in accordance with any conditions for the time being specified by the local authority as respects the nature, type and quantity of waste that may be deposited, and other facilities for (i) The segregation, mixing, baling, storage or treatment of waste prior to its recovery or disposal (ii) The recovery of waste (iii) The disposal of waste (other than household).
Recycling Bring Scheme	A scheme which provides facilities in high-density areas, where waste may be deposited by members of the public, each site strategically located so as to serve an optimum amount of people in a neighbourhood.
Home Compost Scheme	Provision of home composting units (free of charge or at a subsidised price) to a designated number of households in an area.
Recycling Bring Banks	Individual stand-alone units within a neighbourhood civic amenity site, recycling bring scheme, etc. For example, bottle bank, can bank, textile bank.
Landfill	Waste disposal facility used for the deposit of waste onto or under land.

APPENDIX B: STATISTICS

B1: DISPOSAL/RECOVERY ROUTES FOR EACH INDUSTRY SECTOR

A detailed breakdown of disposal and recovery routes reported for each industry sector is provided here. The following Table provides the description of each NACE industry code used below.

NACE Code	Industry Sector
C	Mining and Quarrying
DA	Food Products, Beverages and Tobacco
DB	Textiles and Textile Products
DC	Leather and Leather Products
DD	Wood and Wood Products
DE	Pulp, Paper and Paper Products; Printing and Publishing
DF	Coke, Refined Petroleum Products and Nuclear Fuel
DG	Chemicals, Chemical Products and Man-Made Fibres
DH	Rubber and Plastic Products
DI	Other Non-Metallic Mineral Products
DJ	Basic Metals and Fabricated Metal Products
DK	Machinery and Equipment not elsewhere classified
DL	Electrical and Optical Equipment
DM	Transport Equipment
DN	Manufacturing not elsewhere classified
E	Electricity, Gas and Water Supply

Disposal/Recovery Method	NACE Sectors								
	Tonnage in 1998								
	Totals	C	DA	DB	DC	DD	DE	DF	DG
Landfill	5,338,170	3,494,249	111,810	6,771	7,454	22,615	5,180	21,257	1,206,684
Land Treatment	73,152	3,019	63,344	7				310	6,195
Impoundment	78,177	5	650				14		37,000
Engineered landfill	62	0							
Biological Treatment	76,558	0	3	61,406					14,309
Physico-chemical Treatment	10,662	0	5,490	427		30		30	2,817
Incineration	57,646	221	2,722	18		236	17		53,219
Permanent storage	590	579							
Release to waters	131,249	0	243	4					
Blending prior to disposal	35	0	1						
Storage prior to disposal	4,866	10	3,822	3		0	1	1,001	9
Re-use in current form	388,759	95	151,980	9,468	43	79,536	456	6,000	25,032
Solvent recovery	84,445	0	277	3	20	20	5		83,136
Organic material recovery	652,564	2,946	551,429	4,479	3,738	58,991	11,889		11,055
Metal recovery	34,266	5,038	1,447	267	10	1,362	43	123	4,041
Inorganic material recovery	28,064	4,680	2,927	1	1,964	279	1,848		1,884
Acid/base regeneration	175	0							
Catalyst recovery	206	0							206
Used oil refining/reuse	3,158	800	187	206		12	3	553	148
Reuse as fuel	88,108	0	152	19		80,727	44		5,577
Beneficial landspreading	798,768	0	739,674		7,828	450			46,729
Storage prior to recovery	9,598	1	1,145						949
Unspecified	161	0	0	5					70
	7,859,439	3,511,643	1,637,303	83,083	21,057	244,259	19,498	29,274	1,499,060

Disposal/Recovery Method	NACE Sectors							
	Tonnage in 1998							
	DH	DI	DJ	DK	DL	DM	DN	E
Landfill	9,051	203,856	17,725	1,154	13,970	5,829	4,492	206,075
Land Treatment		270						8
Impoundment								40,508
Engineered landfill			12	7	43			
Biological Treatment			746		18			76
Physico-chemical Treatment	138	38	855	88	607	23	36	82
Incineration	346	238	284	1	266	50	19	7
Permanent storage			6				5	
Release to waters			2					131,000
Blending prior to disposal			32	2				
Storage prior to disposal	1	3	4		11		1	1
Re-use in current form	1,737	1,213	35,562	16	660	52	5,895	71,014
Solvent recovery	367	1	62	316	210	8	10	11
Organic material recovery	1,403	32	2,147	68	3,476	30	859	22
Metal recovery	618	396	14,174	2,075	2,758	1,123	312	480
Inorganic material recovery	3,971	6,367	3,192		832	108	11	1
Acid/base regeneration			175			0		
Catalyst recovery								
Used oil refining/reuse	25	474	282	5	251	9	34	169
Reuse as fuel	1		221	13	641	12	700	2
Beneficial landspreading			3,706				196	184
Storage prior to recovery			7,502					
Unspecified			86		1			
	17,658	212,887	86,776	3,744	23,744	7,244	12,569	449,640

B2: WASTES REPORTED CATEGORISED ACCORDING TO EWC/HWL CODES

EWC Code	Description	Hazardous	Quantity (tonnes/ annum)
01 00 00	**Wastes resulting from the exploration, mining dressing and further treatment of minerals and quarrying**		
01 01 00	Waste from mineral excavation		
01 01 01	waste from mineral metaliferous excavation	No	350,000
01 01 02	waste from mineral non-metaliferous excavation	No	1,033,231
01 03 00	Wastes from further physical and chemical processing of metaliferous minerals		
01 03 01	tailings	No	2,112,302
01 03 02	dusty and powdery waste	No	0
01 03 03	red mud from the alumina production	No	781,954
01 03 99	wastes not otherwise specified	No	266,130
01 04 00	Wastes from further physical and chemical processing of non-metaliferous minerals		
01 04 01	waste gravel and crushed rocks	No	184,728
01 04 03	dusty and powdery waste	No	1,500
01 04 05	waste from washing and cleaning of minerals	No	600
02 00 00	**Waste from agricultural, horticultural, hunting, fishing and aquaculture primary production , food preparation and processing**		
02 01 00	Primary production waste		
02 01 01	sludges from washing and cleaning	No	23
02 01 02	animal tissue waste	No	61,096
02 01 04	waste plastics (excluding packaging)	No	7,629
02 01 05	agrochemical wastes	Yes	3
02 01 06	animal faeces, urine and manure (including spoiled straw), effluent, collected separately and treated off-site	No	64,269
02 01 99	wastes not otherwise specified	No	14,541
02 02 00	Wastes from the preparation and processing of meat, fish and other foods of animal origin		
02 02 01	sludges from washing and cleaning	No	103
02 02 02	animal tissue waste	No	378,505
02 02 03	materials unsuitable for consumption or processing	No	59,888
02 02 04	sludges from on-site effluent treatment	No	490,644
02 02 99	wastes not otherwise specified	No	30,964
02 03 00	Wastes from fruit, vegetables, cereals, edible oils, cocoa, coffee and tobacco preparation: processing, conserve production: tobacco preparation		
02 03 01	sludges from washing, cleaning, peeling, centrifuging and separation	No	1,242
02 03 04	materials unsuitable for consumption or processing	No	5,952
02 03 05	sludges from on-site effluent treatment	No	3,172
02 03 99	wastes not otherwise specified	No	1,810
02 04 00	Wastes from sugar processing		
02 04 01	soil from cleaning and washing beet	No	15,713
02 04 02	off-specification calcium carbonate	No	48,260
02 04 99	wastes not otherwise specified	No	82,153
02 05 00	Wastes from the dairy products industry		
02 05 01	materials unsuitable for consumption or processing	No	45,813
02 05 02	sludges from on-site effluent treatment	No	110,802
02 05 99	wastes not otherwise specified	No	46,126
02 06 00	Wastes from the baking and confectionery industry		
02 06 01	materials unsuitable for consumption or processing	No	3,157
02 06 99	wastes not otherwise specified	No	5,644
02 07 00	Wastes from the production of alcoholic and non- alcoholic beverages (excluding coffee, tea and cocoa)		
02 07 04	materials unsuitable for consumption or processing	No	863

EWC Code	Description	Hazardous	Quantity (tonnes/ annum)
02 07 05	sludges from on-site effluent treatment	No	688
02 07 99	wastes not otherwise specified	No	116,070
03 00 00	**Wastes from wood processing and the production of paper, cardboard, pulp panels and furniture**		
03 01 00	Wastes from wood processing and the production of panels and furniture		
03 01 01	waste bark and cork	No	55,161
03 01 02	sawdust	No	69,225
03 01 03	shavings, cuttings, spoiled timber/particle board/veneer	No	80,858
03 01 99	wastes not otherwise specified	No	28,764
03 02 00	Wood preservation waste		
03 02 03	organometallic wood preservatives	Yes	0
03 02 04	inorganic wood preservatives	Yes	75
03 03 07	rejects from paper and cardboard recycling	No	1
03 03 99	wastes not otherwise specified	No	51
04 00 00	**Wastes from leather and textile industries**		
04 01 00	Wastes from the leather industry		
04 01 01	fleshings and lime split waste	No	1,664
04 01 02	liming waste	No	1,720
04 01 03	degreasing wastes containing solvents without a liquid phase	Yes	36
04 01 08	waste tanned leather (blue sheetings, shavings, cuttings, buffing dust) containing chromium	No	142
04 01 99	wastes not otherwise specified	No	8,134
04 02 00	Wastes from the textile industry		
04 02 02	wastes from unprocessed textile fibres mainly of animal origin	No	144
04 02 03	wastes from unprocessed textile fibres mainly artificial or synthetic	No	836
04 02 05	wastes from processed textile fibres mainly of vegetable origin	No	48
04 02 06	wastes from processed textile fibres mainly of animal origin	No	246
04 02 07	wastes from processed textile fibres mainly of artificial or synthetic origin	No	6,054
04 02 08	wastes from processed mixed textile fibres	No	4,162
04 02 09	wastes from composite materials (impregnated textile, elastomer, plastomer)	No	250
04 02 12	non-halogenated wastes from dressing and finishing	No	290
04 02 13	dye stuffs and pigments	No	61,628
04 02 99	wastes not otherwise specified	No	1,159
05 00 00	**Wastes from petroleum refining , natural gas purification and pyrolytic treatment of coal**		
05 01 00	Oily sludges and solid wastes		
05 01 02	desalter sludges	No	100
05 01 03	tank bottom sludges	Yes	6,003
05 01 06	sludges from plant, equipment and maintenance operations	No	100
05 01 99	wastes not otherwise specified	No	3
05 03 00	Spent catalysts		
05 03 01	spent catalysts containing precious metals	No	23
05 03 02	other spent catalysts	No	10
05 05 00	Oil desulphurisation wastes		
05 05 01	waste containing sulphur	No	1,000

EWC Code	Description	Hazardous	Quantity (tonnes/ annum)
05 06 00	Waste from the pyrolytic treatment of coal		
05 06 99	wastes not otherwise specified	No	230
06 00 00	**Wastes from inorganic chemical processes**		
06 01 00	Waste acidic solutions		
06 01 01	sulphuric acid and sulphurous acid	Yes	7
06 01 02	hydrochloric acid	Yes	1
06 01 03	hydrofluoric acid	Yes	66
06 01 04	phosphoric and phosphorous acid	Yes	2
06 01 05	nitric acid and nitrous acid	Yes	3
06 01 99	waste not otherwise specified	Yes	133
06 02 00	Waste alkaline solutions		
06 02 01	calcium hydroxide	Yes	2,576
06 02 02	soda	Yes	22
06 02 03	ammonia	Yes	412
06 02 99	wastes not otherwise specified	Yes	34
06 03 00	Waste salts and their solutions		
06 03 02	saline solutions containing sulphates, sulphites or sulphides	No	6,620
06 03 03	solid salts containing sulphates, sulphites or sulphides	No	60
06 03 04	saline solutions containing chlorides, fluorides and halides	No	14
06 03 05	solid salts containing chlorides, fluorides and other halogenated solid salts	No	407
06 03 08	saline solutions containing nitrates and related compounds	No	0
06 03 12	salts and solutions containing organic compounds	No	1
06 03 99	wastes not otherwise specified	No	32,232
06 04 00	Metal containing wastes		
06 04 03	wastes containing arsenic	Yes	0
06 04 04	wastes containing mercury	Yes	536
06 04 05	wastes containing other heavy metals	Yes	69
06 04 99	wastes not otherwise specified	No	12
06 05 00	Sludges from on-site effluent treatment		
06 05 01	sludges from on-site effluent treatment	No	4,669
06 08 00	Wastes from the production of silicon and silicon derivatives		
06 08 01	wastes from production of silicon and silicon derivatives	No	3
06 12 00	Wastes from production, use and regeneration of catalysts		
06 12 01	spent catalysts containing precious metals	No	1
06 12 02	other spent catalysts	No	8
06 13 00	Wastes from other inorganic chemical processes		
06 13 01	inorganic pesticides, biocides and wood preserving agents	Yes	53
06 13 02	spent activated carbon (except 06 07 02)	Yes	3
06 13 99	wastes not otherwise specified	No	640
07 00 00	**Wastes from organic chemical processes**		
07 01 00	Waste from the MFSU of basic organic chemicals		
07 01 01	aqueous washing liquids and mother liquors	Yes	434
07 01 02	sludges from on-site effluent treatment	No	38,173

EWC Code	Description	Hazardous	Quantity (tonnes/ annum)
07 01 03	organic halogenated solvents, washing liquids and mother liquors	Yes	100
07 01 04	other organic solvents, washing liquids and mother liquors	Yes	2
07 01 09	halogenated filter cakes, spent absorbents	Yes	60
07 01 10	other filter cakes, spent absorbents	Yes	355
07 01 99	wastes not otherwise specified	No	21,118
07 02 00	Waste from the MFSU of plastics, synthetic rubber and man made fibres		
07 02 01	aqueous washing liquids and mother liquors	Yes	123
07 02 04	other organic solvents, washing liquids and mother liquors	Yes	60
07 02 08	other still bottoms and reaction residues	Yes	58
07 02 99	wastes not otherwise specified	No	5,359
07 03 00	Waste from the MFSU of organic dyes and pigments (excluding 06 11 00)		
07 03 02	sludges from on-site effluent treatment	No	2
07 03 04	other organic solvents, washing liquids and mother liquors	Yes	1
07 03 08	other still bottoms and reaction residues	Yes	114
07 03 99	wastes not otherwise specified	No	1
07 04 00	Waste from the MFSU of organic pesticides (excluding 02 01 05)		
07 04 01	aqueous washing liquids and mother liquors	Yes	8
07 04 04	other organic solvents, washing liquids and mother liquors	Yes	4
07 04 10	other filter cakes, spent absorbents	Yes	1
07 04 99	wastes not otherwise specified	No	19
07 05 00	Waste from the MFSU of pharmaceuticals		
07 05 01	aqueous washing liquids and mother liquors	Yes	28,440
07 05 02	sludges from on-site effluent treatment	No	11,997
07 05 03	organic halogenated solvents, washing liquids and mother liquors	Yes	6,790
07 05 04	other organic solvents, washing liquids and mother liquors	Yes	60,315
07 05 05	spent catalysts containing precious metals	No	96
07 05 06	other spent catalysts	No	163
07 05 07	halogenated still bottoms and reaction residues	Yes	257
07 05 08	other still bottoms and reaction residues	Yes	1,013
07 05 09	halogenated filter cakes, spent absorbents	Yes	67
07 05 10	other filter cakes, spent absorbents	Yes	1,787
07 05 99	wastes not otherwise specified	No	6,315
07 06 00	Waste from the MFSU of fats, grease, soaps, detergents, disinfectants and cosmetics		
07 06 01	aqueous washing liquids and mother liquors	Yes	1,504
07 06 02	sludges from on-site effluent treatment	No	407
07 06 04	other organic solvents, washing liquids and mother liquors	Yes	8
07 06 05	spent catalysts containing precious metals	No	142
07 06 08	other still bottoms and reaction residues	Yes	40
07 06 10	other filter cakes, spent absorbents	Yes	103
07 06 99	wastes not otherwise specified	No	218
07 07 00	Waste from the MFSU of fine chemicals and chemicals products not otherwise specified		
07 07 01	aqueous washing liquids and mother liquors	Yes	3,287
07 07 02	sludges from on site effluent treatment	No	2,659
07 07 03	organic halogenated solvents, washing liquids and mother liquors	Yes	7

EWC Code	Description	Hazardous	Quantity (tonnes/ annum)
07 07 04	other organic solvents, washing liquids and mother liquors	Yes	50,133
07 07 08	other still bottoms and reaction residues	Yes	2,718
07 07 10	other filter cakes, spent absorbents	Yes	311
07 07 99	wastes not otherwise specified	No	2,502
08 00 00	**Wastes from the MFSU of coatings,(paints, varnishes and vitreous enamels, adhesives, sealants and printing inks**		
08 01 00	Wastes from the MFSU of paints and varnish		
08 01 01	waste paints and varnish containing halogenated solvents	Yes	5
08 01 02	waste paints and varnish free of halogenated solvents	Yes	97
08 01 03	waste from water-based paints and varnishes	No	704
08 01 04	powder paints	No	27
08 01 05	hardened paints and varnishes	No	11
08 01 06	sludges from paint or varnish removal containing halogenated solvents	Yes	13
08 01 07	sludges from paint or varnish removal free of halogenated solvents	Yes	220
08 01 08	aqueous sludges containing paint or varnish	No	980
08 01 09	waste from paint or varnish removal (except 08 01 05 and 08 01 06)	No	13
08 01 99	wastes not otherwise specified	No	1,509
08 02 00	Wastes from the MFSU of other coating (including ceramic materials)		
08 02 01	waste coating powders	No	62
08 02 99	wastes not otherwise specified	No	1
08 03 00	Wastes from the MFSU of printing inks		
08 03 01	waste ink containing halogenated solvents	Yes	69
08 03 02	waste ink free of halogenated solvents	Yes	329
08 03 03	waste from water-based ink	No	340
08 03 04	dried ink	No	7
08 03 06	ink sludges free of halogenated solvents	Yes	3
08 03 07	aqueous sludges containing ink	No	12
08 03 08	aqueous liquid waste containing ink	No	22
08 03 09	waste printing toner (including cartridges)	No	0
08 03 99	wastes not otherwise specified	No	653
08 04 00	Wastes from the MFSU of adhesives and sealants (including waterproofing products)		
08 04 01	waste adhesives and sealants containing halogenated solvents	Yes	120
08 04 02	waste adhesives and sealants free of halogenated solvents	Yes	71
08 04 03	wastes from water-based adhesives and sealants	No	34
08 04 04	hardened adhesives and sealants	No	0
08 04 08	aqueous liquid wastes containing adhesives and sealants	No	130
08 04 99	wastes not otherwise specified	No	77
09 00 00	**Wastes from the photographic industry**		
09 01 00	Wastes from the photographic industry		
09 01 01	water based developer and activator solutions	Yes	1
09 01 02	water based offset plate developer solutions	Yes	19
09 01 03	solvent based developer solutions	Yes	1
09 01 04	fixer solutions	Yes	9
09 01 06	waste containing silver from on-site treatment of photographic waste	Yes	1

EWC Code	Description	Hazardous	Quantity (tonnes/ annum)
09 01 07	photographic film and paper containing silver or silver compounds	No	
09 01 08	photographic film and paper free of silver or silver compounds	No	1
09 01 99	wastes not otherwise specified	No	7
10 00 00	**Inorganic wastes from thermal processes**		
10 01 00	Wastes from power stations and other combustion plants (except 19 00 00)		
10 01 01	bottom ash	No	36,211
10 01 02	coal fly ash	No	194,301
10 01 03	peat fly ash	No	66,825
10 01 04	oil fly ash	Yes	330
10 01 11	aqueous sludges from boiler cleansing	No	14,988
10 01 12	spent linings and refractories	No	259
10 01 99	wastes not otherwise specified	No	845
10 02 00	Wastes from the iron and steel industry		
10 02 01	waste from the processing of slag	No	35,000
10 02 03	solid wastes from gas treatment	No	3,366
10 02 04	sludges from gas treatment	No	100
10 02 05	other sludges	No	500
10 02 06	spent linings and refractories	No	8,860
10 02 99	wastes not otherwise specified	No	7,770
10 04 00	Wastes from lead thermal metallurgy		
10 04 02	dross and skimmings (first and second smelting)	Yes	937
10 04 99	wastes not otherwise specified	No	61
10 05 00	Wastes from zinc thermal metallurgy		
10 05 01	slags (first and second smelting)	Yes	1
10 05 02	dross and skimmings (first and second smelting)	Yes	245
10 05 04	other particulates and dust	No	225
10 05 99	wastes not otherwise specified	No	2
10 07 00	Wastes from silver, gold and platinum thermal metallurgy		
10 07 04	other particulates and dust	No	1
10 07 99	wastes not otherwise specified	No	9
10 08 00	Wastes from other non-ferrous thermal metallurgy		
10 08 02	dross and skimmings (first and second smelting)	No	5
10 09 00	Wastes from casting of ferrous pieces		
10 09 02	casting cores and moulds containing organic binders which have undergone pouring	No	1,900
10 09 03	furnace slag	No	960
10 09 99	wastes not otherwise specified	No	650
10 10 00	Wastes from casting of non-ferrous pieces		
10 10 03	furnace slag	No	9
10 10 99	wastes not otherwise specified	No	420
10 11 00	Wastes from manufacture of glass and glass products		
10 11 01	waste preparation mixture before thermal processing	No	56
10 11 02	waste glass	No	4,258
10 11 03	waste glass-based fibrous materials	No	600
10 11 08	spent linings and refractories	No	10
10 11 99	wastes not otherwise specified	No	12

EWC Code	Description	Hazardous	Quantity (tonnes/ annum)
10 12 00	Wastes from manufacture of ceramic goods, brink, tiles and construction products		
10 12 06	discarded moulds	No	255
10 12 99	wastes not otherwise specified	No	26
10 13 00	Wastes from manufacture of cement, lime and plaster and articles and products made from them		
10 13 03	wastes from other cement-based composite materials	No	860
10 13 04	waste from calcination and hydration of lime	No	2,100
10 13 05	solid waste from gas treatment	No	15,000
10 13 06	other particulates and dust	No	2,005
10 13 08	spent linings and refractories	No	1,417
10 13 99	wastes not otherwise specified	No	8,208
11 00 00	**Inorganic wastes with metals from metal treatment and the coating of metals , non-ferrous hydrometallurgy**		
11 01 00	Liquid wastes and sludges from metal treatment and coating of metals, galvanic processes, zinc coating processed, pickling processes, etching, phosphatizing, alkaline degreasing		
11 01 01	cyanidic (alkaline) wastes containing heavy metals other than chromium	Yes	105
11 01 02	cyanidic (alkaline) wastes which do not contain heavy metals	Yes	4
11 01 03	cyanide-free wastes containing chromium	Yes	28
11 01 04	cyanide-free wastes not containing chromium	No	19
11 01 05	acidic pickling solutions	Yes	1,078
11 01 06	acids not otherwise specified	Yes	42
11 01 07	alkalis not otherwise specified	Yes	138
11 01 08	phosphatizing sludges	Yes	194
11 02 00	Wastes and sludges from non-ferrous hydrometallurgical processes		
11 02 03	wastes from the production of anodes for aqueous electrolytical processes	No	1
11 02 04	sludges not otherwise specified	No	31
11 03 00	Sludges and solids from tempering processes		
11 03 02	other wastes	Yes	1
11 04 00	Other inorganic wastes with metals not otherwise specified		
11 04 01	other inorganic wastes with metals not otherwise specified	No	34
12 00 00	**Wastes from shaping and surface treatment of metals and plastics**		
12 01 00	Wastes from shaping (including forging, welding, pressing, drawing, turning, cutting and filing)		
12 01 01	ferrous metal filings and turnings	No	7,667
12 01 02	other ferrous metals particles	No	2,641
12 01 03	non-ferrous metal filings and turnings	No	1,691
12 01 04	other non-ferrous metal particulates	No	1,653
12 01 05	plastics particles	No	1,635
12 01 06	waste machining oils containing halogens (not emulsioned)	Yes	62
12 01 07	waste machining oils free of halogens (not emulsioned)	Yes	141
12 01 09	waste machining emulsions free of halogens	Yes	126
12 01 10	synthetic machining oils	Yes	28
12 01 11	machining sludges	Yes	114
12 01 13	welding wastes	No	2
12 01 99	wastes not otherwise specified	No	2,631
12 02 00	Wastes from mechanical surface treatment processes (blasting, grinding, honing, lapping, polishing)		
12 02 01	spent blasting grit	No	441
12 02 02	sludges from grinding, honing and lapping	No	45

EWC Code	Description	Hazardous	Quantity (tonnes/ annum)
12 02 03	polishing sludges	No	173
12 02 99	wastes not otherwise specified	No	278
12 03 00	Wastes from water and steam degreasing processes (except 11 00 00)		
12 03 01	aqueous washing liquids	Yes	18
13 00 00	**Oil Wastes (except edible oils, 05 00 00 and 12 00 00**		
13 01 00	Waste hydraulic oils and brake fluids		
13 01 01	hydraulic oils, containing pcbs or pcts	Yes	516
13 01 02	other chlorinated hydraulic oils (not emulsions)	Yes	6
13 01 03	non chlorinated hydraulic oils (not emulsions)	Yes	296
13 01 05	non chlorinated emulsions	Yes	2
13 01 06	hydraulic oils containing only mineral oil	Yes	457
13 01 07	other hydraulic oils	Yes	12,168
13 01 08	brake fluids	Yes	1
13 02 00	Waste engine, gear and lubricating oils		
13 02 01	chlorinated engine, gear and lubricating oils	Yes	109
13 02 02	non-chlorinated engine, gear, lubricating oils	Yes	208
13 02 03	other engine, gear and lubricating oils	Yes	565
13 03 00	Waste insulating and heat transmission oils and other liquids		
13 03 01	insulating or heat transmission oils and other liquids containing pcbs or pcts	Yes	10
13 03 02	other chlorinated insulating and heat transmission oils and other liquids	Yes	5
13 03 03	non-chlorinated insulating and heat transmission oils and other liquids	Yes	29
13 03 04	synthetic insulating and heat transmission oils and other liquids	Yes	7
13 03 05	mineral insulating and heat transmission oils	Yes	36
13 05 00	Oil/water separator contents		
13 05 01	oil/water separator solids	Yes	103
13 05 02	oil/water separator sludges	Yes	56
13 05 03	interceptor sludges	Yes	10,059
13 05 05	other emulsions	Yes	61
13 05 00	Oil waste not otherwise specified		
13 06 01	oil waste not otherwise specified	Yes	567
14 00 00	**Wastes from organic substances employed as solvents (except 07 00 00 and 08 00 00)**		
14 01 00	Wastes from metal degreasing and machinery maintenance		
14 01 01	chlorofluorocarbons	Yes	20
14 01 02	other halogenated solvents and solvent mixes	Yes	56
14 01 03	other solvents and solvent mixes	Yes	24
14 01 05	aqueous solvent mixes free of halogens	Yes	1
14 01 06	sludges or solid wastes containing halogenated solvents	Yes	0
14 02 00	Wastes from textile cleaning and degreasing of natural products		
14 02 04	sludges or solid wastes containing other solvents	Yes	4
14 03 00	Wastes from electronic industry		
14 03 02	other halogenated solvents	Yes	1
14 03 03	solvents and solvent mixes free of halogenated solvents	Yes	664
14 03 05	sludges or solid wastes containing other solvents	Yes	13

EWC Code	Description	Hazardous	Quantity (tonnes/ annum)
14 04 00	Wastes from coolants, foam/aerosol propellants		
14 04 03	other solvents and solvent mixes	Yes	12
14 04 05	sludges or solid wastes containing other solvents	Yes	2
14 05 00	Wastes from solvent and coolant recovery (still bottoms)		
14 05 02	halogenated solvents and solvent mixes	Yes	4
14 05 03	other solvents and solvent mixes	Yes	53
14 05 05	sludges containing other solvents	Yes	31
15 00 00	**Packaging, adsorbents, wiping cloths, filter materials and protective clothing not otherwise specified**		
15 01 00	Packaging		
15 01 01	paper and cardboard	No	29,642
15 01 02	plastic	No	5,228
15 01 03	wooden	No	9225
15 01 04	metallic	No	3,411
15 01 05	composite packaging	No	4,063
15 01 06	mixed	No	15,393
15 02 00	absorbents, filter materials, wiping cloths, protective clothing		
15 02 01	absorbents, filter materials, wiping cloths, protective clothing	No	2,704
16 00 00	**Wastes not otherwise specified in the catalogue**		
16 01 00	End of Life vehicles		
16 01 01	catalysts removed from vehicles containing precious metals	No	59
16 01 03	used tyres	No	165
16 01 04	discarded vehicles	No	4,660
16 01 99	wastes not otherwise specified	No	28
16 02 00	Discarded equipment and shredder residues		
16 02 01	transformers and capacitors containing pcb or pcts	Yes	120
16 02 02	other discarded electronic equipment (e.g. printed circuit boards)	No	328
16 02 05	other discarded equipment	No	231
16 02 07	waste from the plastic convertor industry	No	718
16 03 00	Off-specification batches		
16 03 01	inorganic off-specification batches	No	168
16 03 02	organic off-specification batches	No	715
16 05 00	Chemicals and gases in containers		
16 05 01	industrial gases in high pressure cylinders, LPG containers and industrial aerosol containers (including halons)	No	88
16 05 02	other waste containing inorganic chemicals, e.g. lab chemicals not otherwise specified, fire extinguishing powders	No	9
16 05 03	other waste containing organic chemicals, e.g. lab chemicals not otherwise specified	No	176
16 06 00	Batteries and accumulators		
16 06 01	lead batteries	Yes	5,172
16 06 02	ni-cd batteries	Yes	18
16 06 03	mercury dry cells	Yes	0
16 06 04	alkaline batteries	No	0
16 06 05	other batteries and accumulators	No	6

EWC Code	Description	Hazardous	Quantity (tonnes/ annum)
16 07 00	Wastes from transport and storage tank cleaning (except 05 00 00 and 12 00 00)		
16 07 02	waste from marine transport tank cleaning, containing oil	Yes	33
16 07 05	waste from storage tank cleaning, containing chemicals	Yes	0
16 07 06	waste from storage tank cleaning, containing oil	Yes	6
16 07 99	waste not otherwise specified	No	0
17 00 00	**Construction and demolition waste (including road construction)**		
17 01 00	Concrete, bricks, ceramics and gypsum based materials		
17 01 01	concrete	No	1,024,711
17 01 02	bricks	No	26,629
17 01 03	tiles and ceramics	No	13,163
17 01 05	asbestos based construction materials	No	1,362
17 02 00	Wood, glass and plastic		
17 02 01	wood	No	50,188
17 02 02	glass	No	2,399
17 02 03	plastic	No	1,164
17 03 00	Asphalt, tar and tarred products		
17 03 01	asphalt containing tar	No	42,945
17 04 00	Metals (including their alloys)		
17 04 01	copper, bronze, brass	No	138
17 04 02	aluminium	No	4,489
17 04 03	lead	No	13
17 04 04	zinc	No	96
17 04 05	iron and steel	No	20,896
17 04 06	tin	No	352
17 04 07	mixed metals	No	42,234
17 04 08	cables	No	592
17 05 00	Soil and dredge spoil		
17 05 01	soil and stones	No	1,428,863
17 05 02	dredging spoil	No	757,720
17 06 00	Insulation Materials		
17 06 01	insulation materials containing asbestos	Yes	1,335
17 06 02	other insulation materials	No	124
17 07 00	Mixed construction and demolition waste		
17 07 01	mixed construction and demolition waste	No	199,148
18 00 00	**Wastes from human or animal health care and/or related research (excluding kitchen and restaurant wastes which do not arise from immediate health care)**		
18 01 00	Wastes from natal care, diagnosis, treatment or prevention of disease in humans		
18 01 01	sharps	No	0
18 01 03	other wastes whose collection and disposal is subject to special requirements in view of the prevention of infection	Yes	3,299
18 01 04	wastes whose collection and disposal is not subject to special requirements in view of the prevention of infection (e.g. dressings, plaster casts, linen, disposable clothing, diapers)	No	9
18 01 05	discarded chemicals and medicines	No	1,767

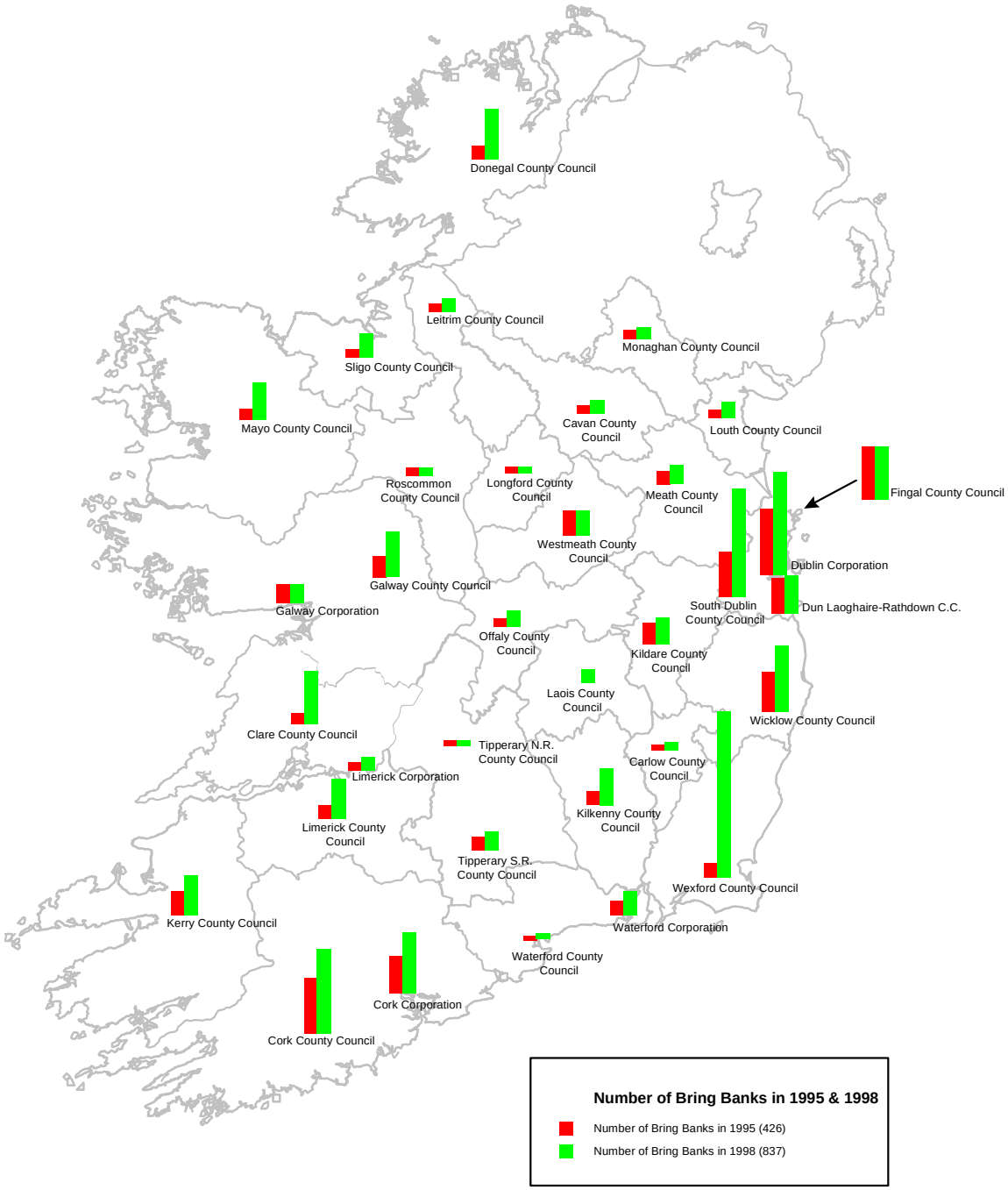
18 02 00	Wastes from natal care, diagnosis, treatment or prevention of disease in animals		
18 02 02	other wastes whose collection and disposal is subject to special requirements in view of the prevention of infection	Yes	3
18 02 03	wastes whose collection and disposal is not subject to special requirements in view of the prevention of infection	No	1
19 00 00	**Wastes from treatment facilities, off-site waste water treatment plants and the water industry**		
19 01 00	Wastes from incineration or pyrolysis of municipal and similar commercial industrial and institutional wastes		
19 01 01	bottom ash and slag	No	50
19 01 03	fly ash	Yes	912
19 01 08	pyrolysis wastes	No	4
19 01 99	wastes not otherwise specified	No	0
19 02 00	Wastes from the specific physicochemical treatments of industrial wastes		
19 02 00	Wastes from specific physico/chemical treatment of industrial wastes		
19 02 01	metal hydroxide sludges and other sludges from metal insolubilisation treatment	Yes	1,696
19 03 00	Stabilised/Solidified Wastes		
19 03 02	wastes stabilized/solidified with organic binders	No	420
19 03 03	wastes stabilized by biological treatment	No	11,655
19 04 00	Vitrified wastes and wastes from vitrification		
19 04 01	vitrified wastes	No	106
19 05 00	Wastes from the aerobic treatment of solid wastes		
19 05 99	wastes not otherwise specified	No	655
19 08 00	Wastes from waste water treatment plants not otherwise specified		
19 08 01	screenings	No	1,364
19 08 03	grease and oil mixture from oil/waste water separation	Yes	620
19 08 04	sludges from the treatment of industrial waste water	No	23,640
19 08 05	sludges from treatment of urban waste water	No	505,689
19 08 06	saturated or spent ion exchange resins	Yes	1
19 08 99	wastes not otherwise specified	No	2,710
19 09 00	Wastes from the preparation of drinking water or water for industrial use		
19 09 01	solid wastes from primary filtration and screening	No	80
19 09 04	spent activated carbon	No	1
19 09 05	saturated or spent ion exchange resins	No	60
19 09 06	solutions and sludges from regeneration of ion exchangers	No	125,387
19 09 99	Waste not otherwise specified	No	38,988
20 00 00	**Municipal wastes and similar commercial, industrial and institutional wastes including separately collected fractions**		
20 01 00	Municipal Waste(EC Catalogue: Separately Collected Fractions)		
20 01 01	paper and cardboard	No	54,118
20 01 01 01	packaging	No	44,170
20 01 01 02	newspapers-brochures	No	2,613
20 01 01 03	magazines & glossy paper	No	3
20 01 01 04	other papers	No	2,634
20 01 01 05	flat packaging cardboard	No	405
20 01 01 06	corrugated packaging cardboard	No	1,275
20 01 01 07	other cardboards	No	590
20 01 01 08	cardboard composite packaging	No	656
20 01 01 11	disposable nappies	No	432

20 01 02	glass	No	2,709
20 01 02 01	green glass packaging	No	8,804
20 01 02 02	clear glass packaging	No	11,649
20 01 02 03	brown glass packaging	No	18,372
20 01 02 04	packaging glass other colour	No	60
20 01 02 05	other glass waste	No	10
20 01 03	small plastics	No	4,249
20 01 03 01	mixed flexible plastic	No	2,164
20 01 03 03	clear PET bottles	No	2
20 01 03 04	mixed rigid plastic	No	53
20 01 03 05	opaque PVC jars & bottles	No	0
20 01 03 07	brown PET jars & bottles	No	1
20 01 03 08	PE bottles	No	27
20 01 03 10	other plastic packaging	No	4,144
20 01 04	other plastics	No	323
20 01 05	small metals (cans etc.)	No	121
20 01 05 01	ferrous metal packaging	No	3,315
20 01 05 02	other ferrous metal waste	No	1,034
20 01 05 03	aluminium packaging	No	549
20 01 05 04	other aluminium waste	No	300
20 01 05 05	other metal packaging	No	88
20 01 06	other metals	No	159,067
20 01 07	wood	No	2,051
20 01 08	organic compostable kitchen waste (including frying oil and kitchen waste from canteens and restaurants)	No	13,610
20 01 09	oil and fat	No	17
20 01 10	clothes	No	975
20 01 11	textiles	No	3,250
20 01 11 01	packaging	No	49
20 01 11 03	health care textiles	No	12
20 01 12	paint, inks, adhesives and resins	Yes	1,805
20 01 13	solvents	Yes	198
20 01 14	acids	No	714
20 01 15	alkalines	No	721
20 01 16	detergents	No	2
20 01 17	photo chemicals	Yes	0
20 01 20	batteries	No	2
20 01 21	fluorescent tubes and other mercury containing waste	Yes	30
20 01 22	aerosols	No	11
20 01 24	electronic equipment (e.g. printed circuit boards)	No	144
20 01 25	unclassified combustibles	No	101
20 01 25 01	wood packaging	No	18
20 01 25 02	other combustible packaging	No	18
20 01 25 03	other unclassified combustibles	No	297
20 01 26	unclassified incombustibles	No	732
20 01 28	fine elements smaller than a 20mm round mesh	no	53

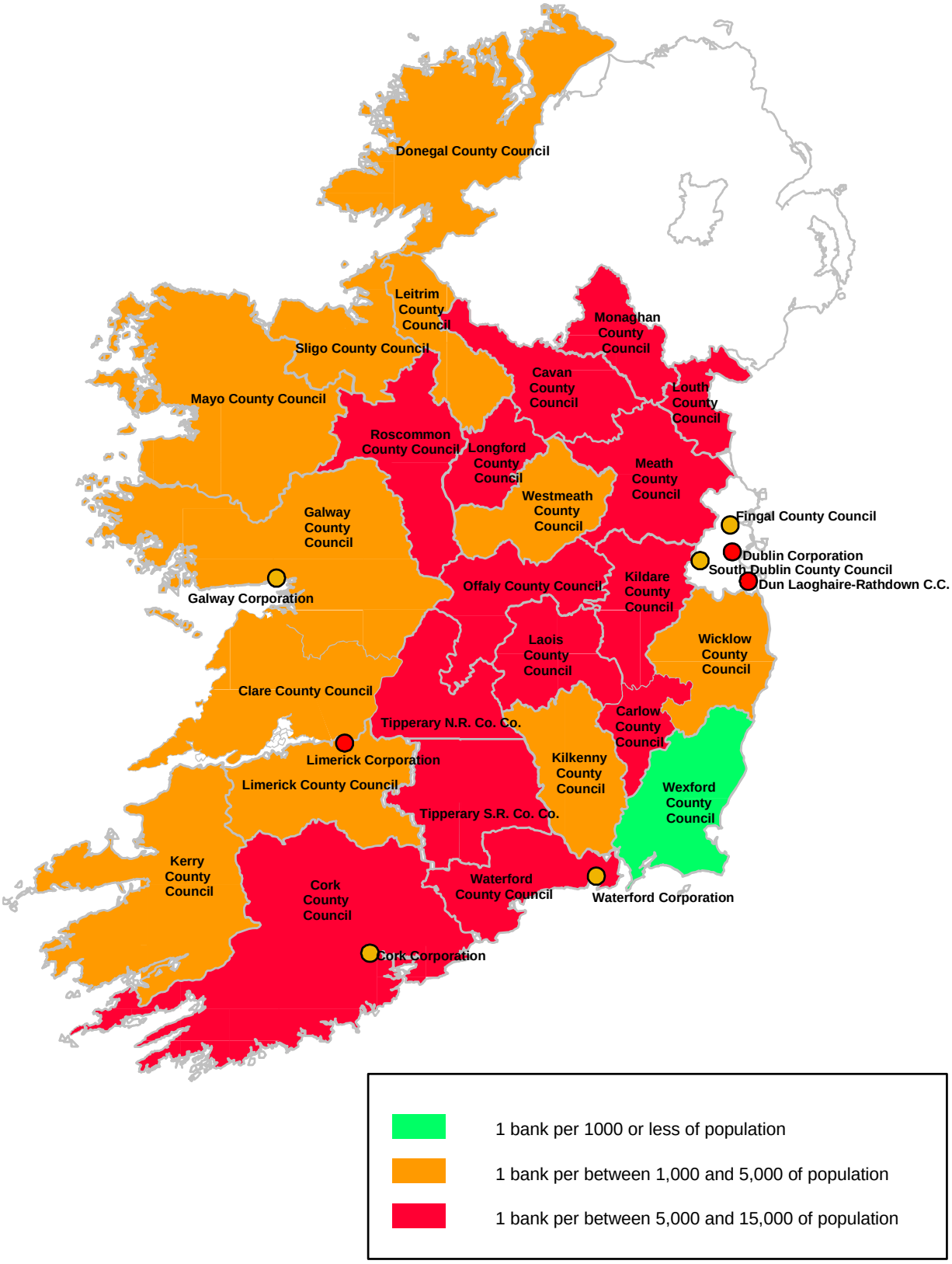
20 02 00	Garden and Park Waste (including cemetery waste)		
20 02 01	compostable wastes	No	5,991
20 02 02	soil and stones	No	1,500
20 03 00	Other Municipal Waste		
20 03 01	mixed municipal waste	No	1,739,575
20 03 03	street cleaning residues	No	80,999
20 03 04	septic tank sludge	No	1,349
20 03 05	end of life vehicles	No	30,000
TOTAL			**14,040,047**

APPENDIX C: FACILITIES

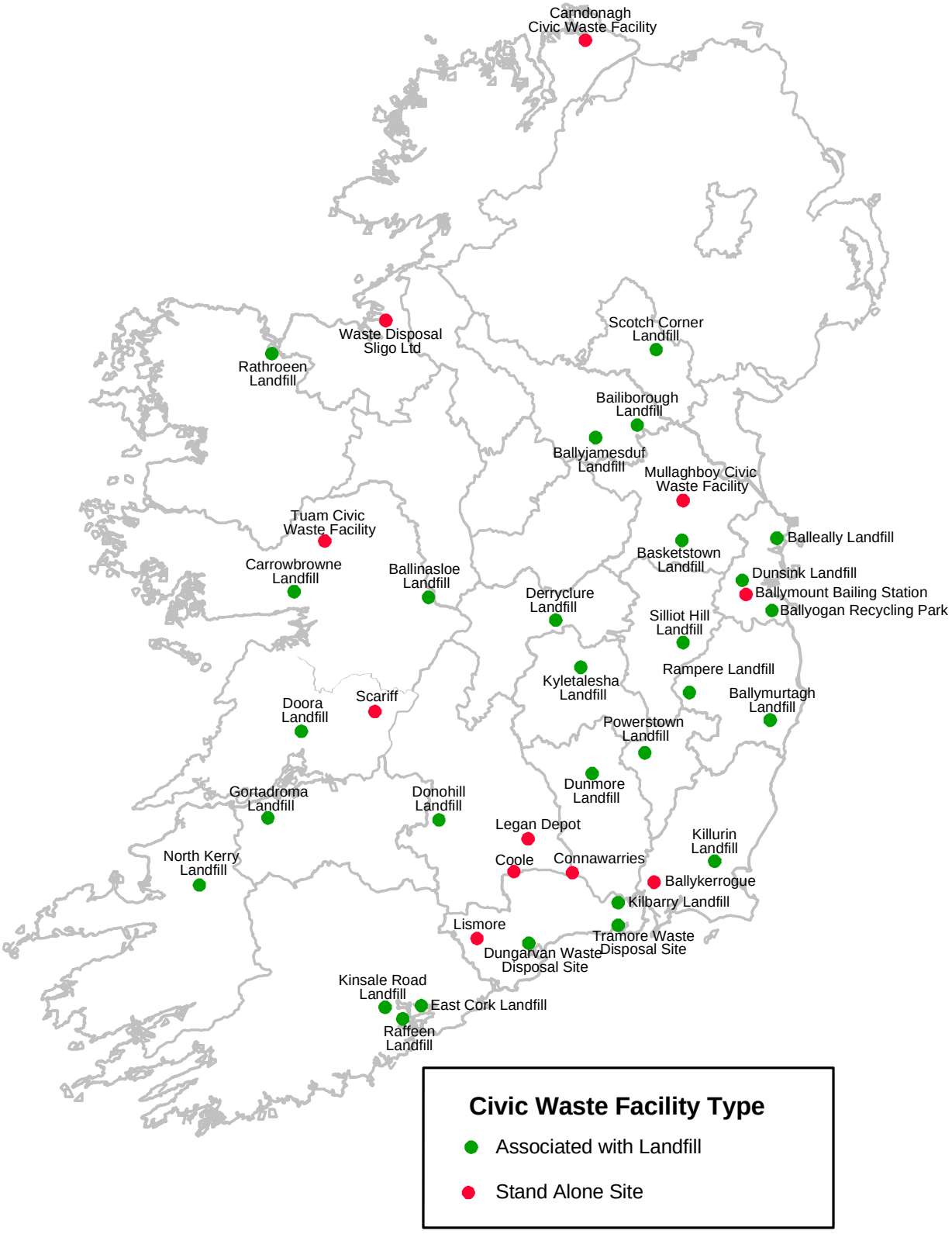
C1: FACILITY MAPS



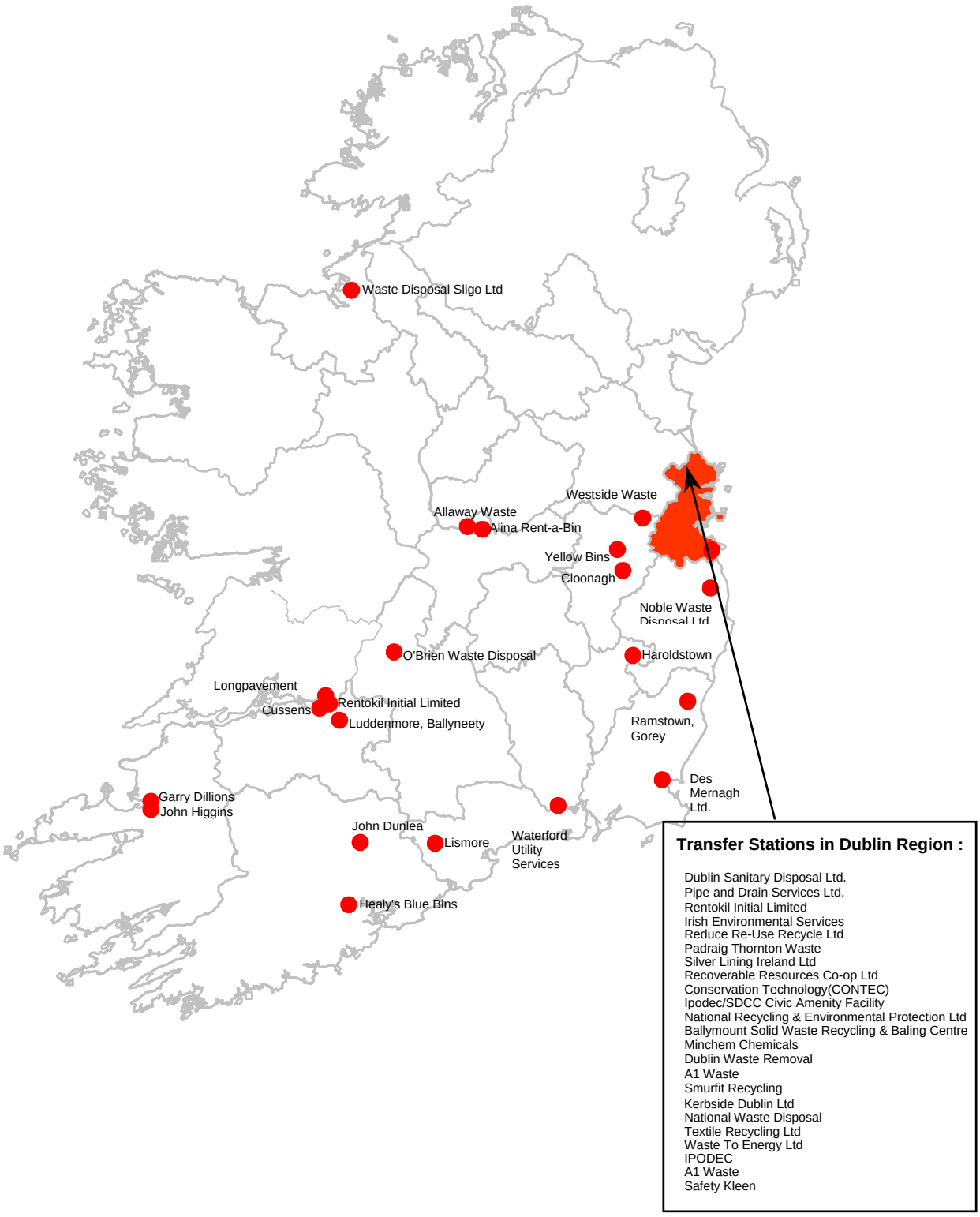
Map 1: Relative Number of Bring Banks per County in Ireland: 1995 and 1998



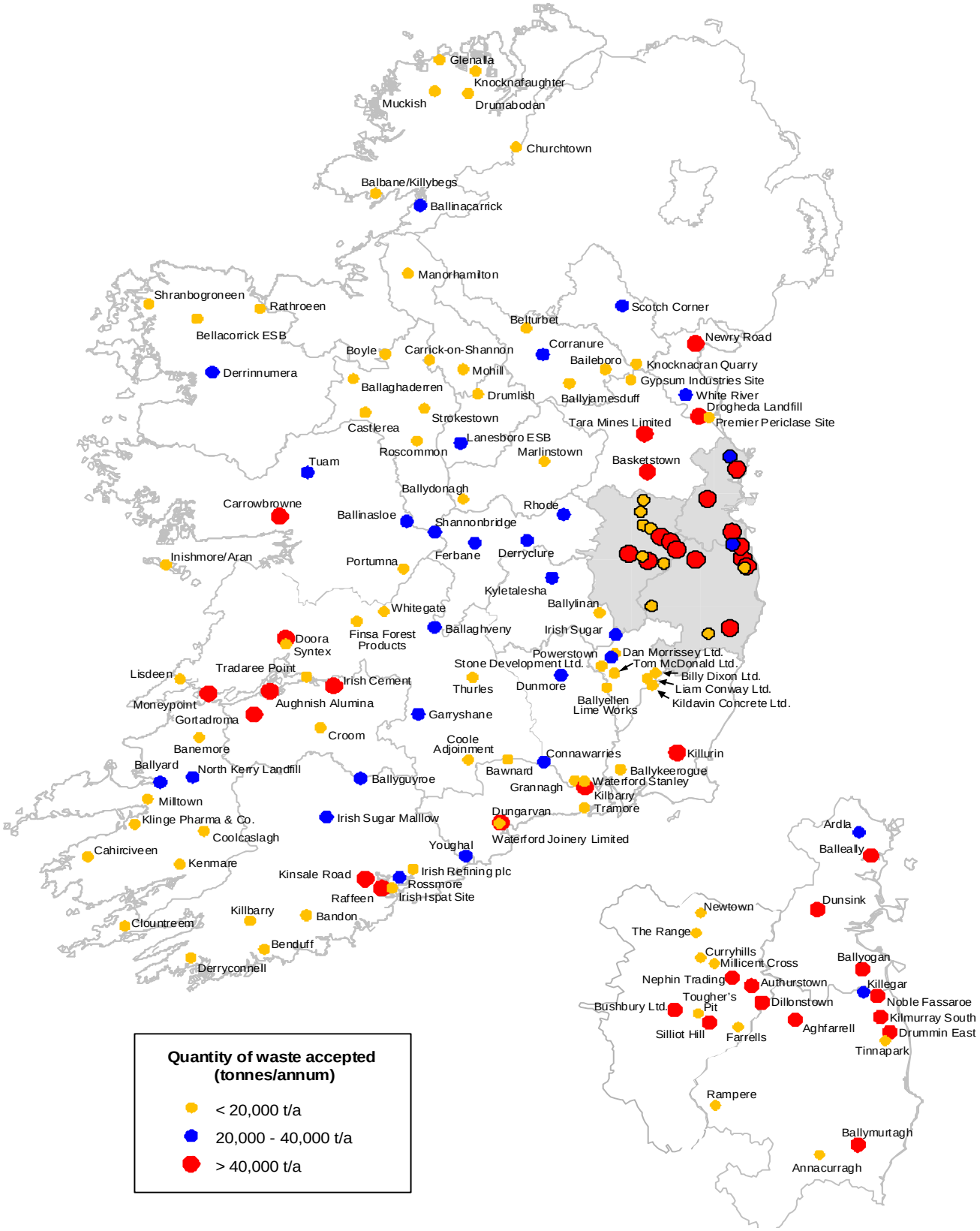
Map 2: Number of Bring Banks per Head of Population per Local Authority Area in 1998



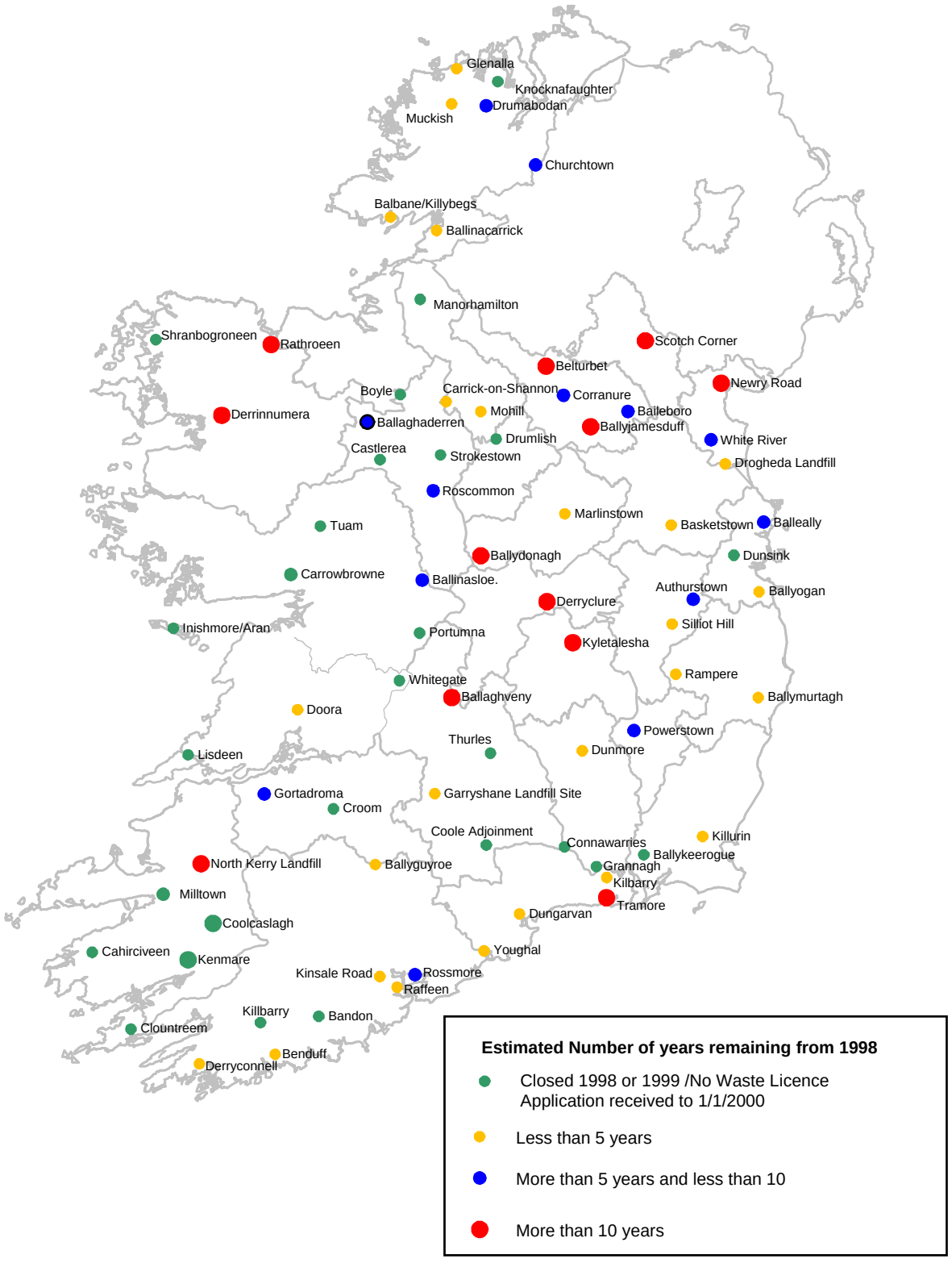
Map 3: Location of Reported Civic Waste Facilities, 1998



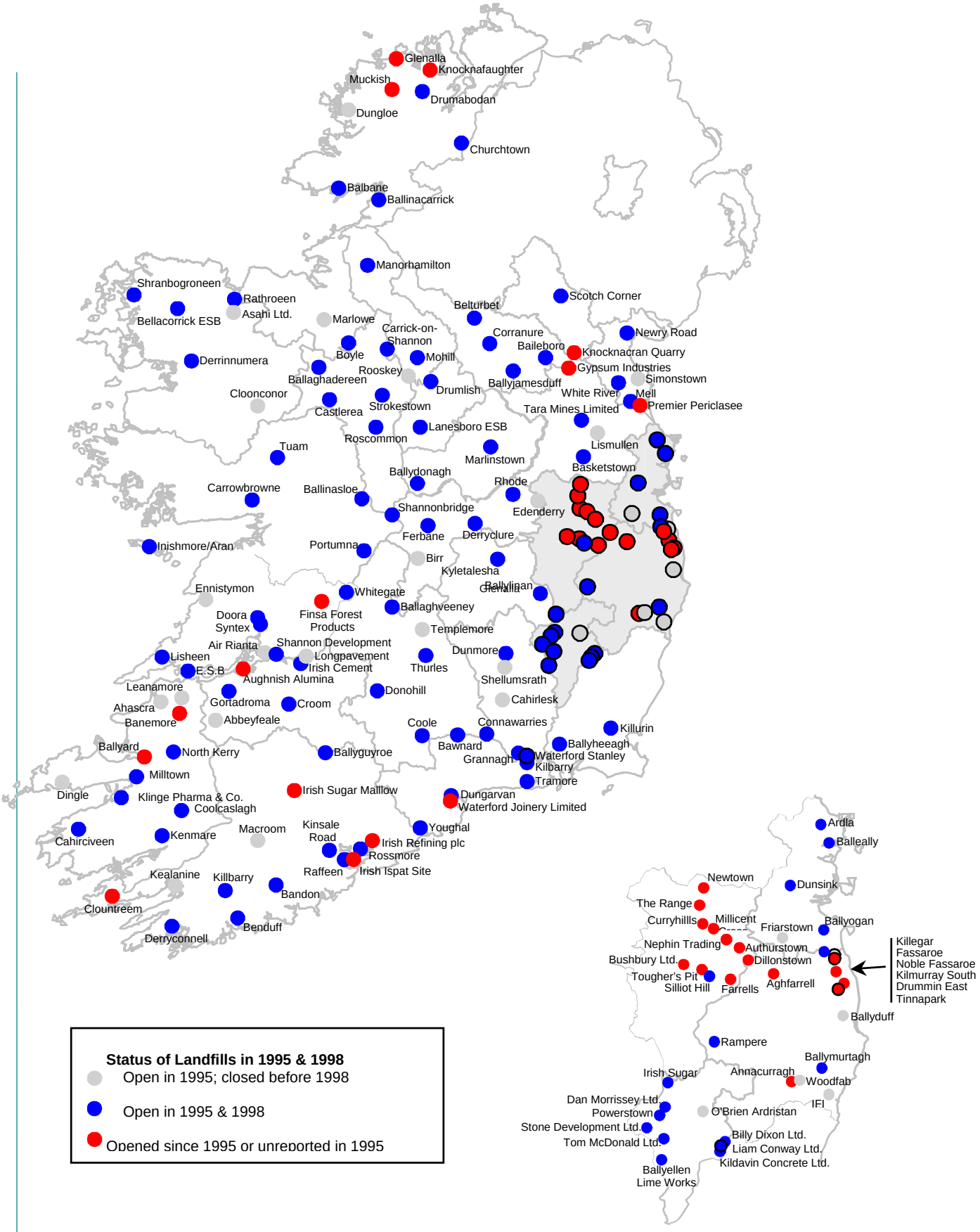
Map 4: Location of Transfer Stations in Ireland, 1998



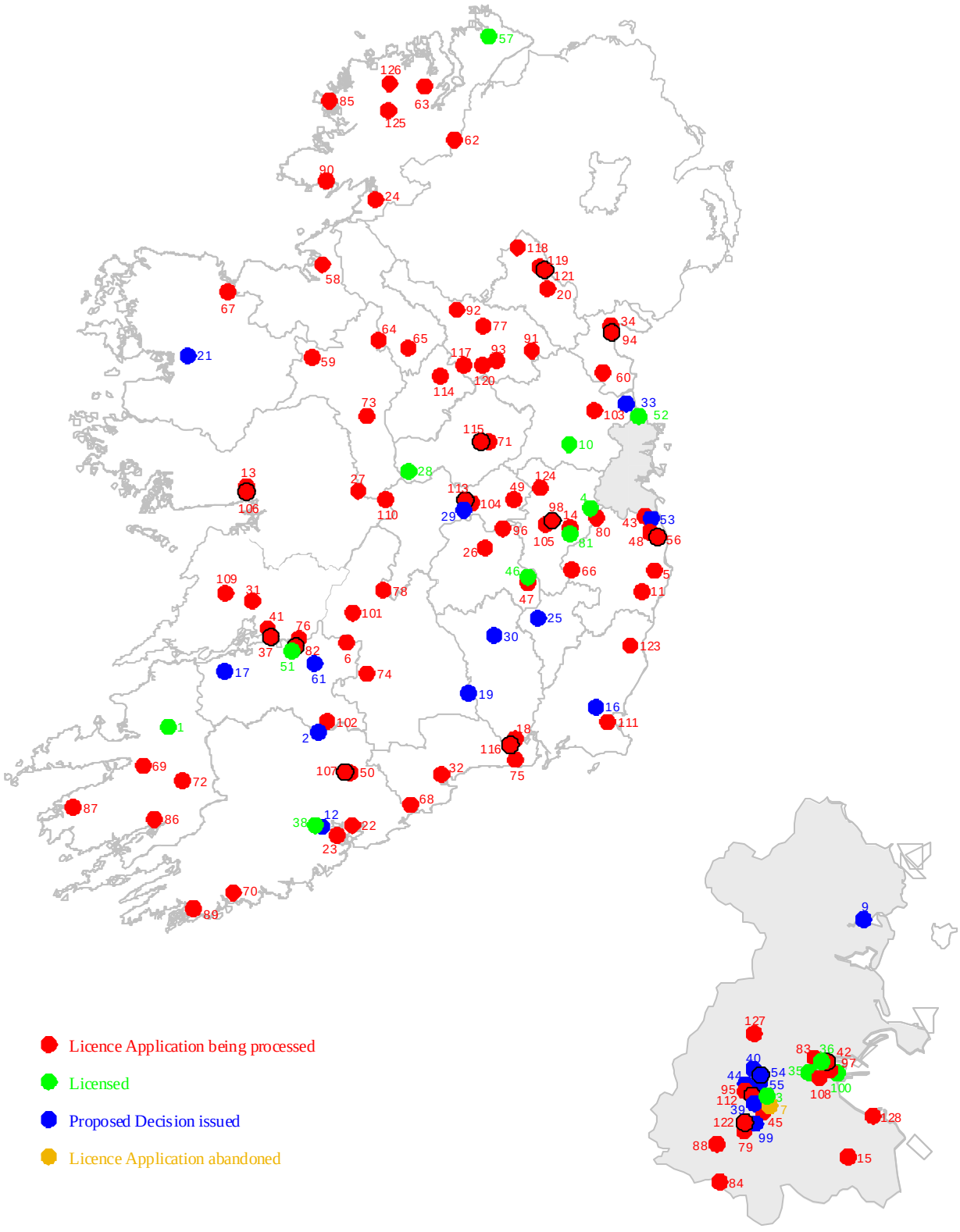
Map 5: Location and Size of Active Landfills in Ireland in 1998



Map 6: Remaining Lifespan of Active Local Authority Landfills in Ireland



Map 7: Comparison of Status of Landfills in 1995 and 1998



Map 8: Geographical Location of Activities for Which the EPA has received a Waste License application

Proposed Decision issued

RegNo	Name
2	Ballyguyroe Landfill Site
9	Balleally Landfill
12	Cork Corporation
16	Killurin Landfill Site
17	Gortadroma Landfill Site
19	Proposed Hardbog Landfill
21	Derrinumera Landfill
25	Powerstown Landfill Site
29	Derryclure Landfill
30	Dunmore Landfill Site
33	Drogheda Landfill
39	IPODEC Ireland Ltd.
40	Sorundon Limited T/A Irish Environmental
44	Thornton's Recycling Centre
53	Noble Waste Disposal Limited
54	Eco-Safe Systems Limited
55	Sterile Technologies Ireland
61	Mr Binman Limited
99	Safety Kleen Ireland Ltd.

Licensed

RegNo	Name
1	North Kerry Landfill
3	Ballymount Bailing Station
4	Arthurstown Landfill
10	Basketstown Landfill Facility
28	Ballydonagh Landfill
35	Pipe & Drain Services Ltd.
36	MinChem Chemicals Ltd
38	Cork University Hospital
46	Ballylinan Landfill Site
51	Bunlicky
52	Drogheda Port Company
57	Carndonagh Civic Amenity
81	KTK Sand & Gravel Ltd.
100	Sir John Rogersons Quay Gasworks

Licence Application abandoned

RegNo	Name
7	Gaelsafe Ltd.

Licence Application being processed

RegNo	Name
5	Proposed East Wicklow Landfill
6	Proposed East Limerick Landfill
11	Ballymurtagh Landfill
13	Carrowbrowne Landfill
14	Silliot Hill Landfill
15	Ballyogan Landfill Ballyogan Recycling Park
18	Kilbarry Landfill
20	Scotch Corner Landfill
22	East Cork Landfill
23	Raffeen Landfill
24	Ballynacarrick Landfill
26	Kyletalesha Landfill
27	Pollboy Landfill
31	Doora Landfill
32	Dungarvan Waste Disposal
34	Dundalk Landfill Amenity
37	Tradaree Point E.T.P.
41	Shannon Environmental Services Ltd.
42	Dean Waste Co. Ltd.
43	Killegar
45	Dean Waste Co. Ltd.
47	Neiphen Trading Ltd.
48	Tony Lawlor
49	Clonbulloge Ash Repository
50	Safeway Warehousing Ltd
56	Mr Denis Doyle
58	Waste Disposal (Sligo) Ltd
59	Ballaghaderreen Landfill
60	Whiteriver Landfill
62	Churchtown Landfill
63	Drumabodan Landfill
64	Carrick On Shannon Landfill
65	Mohill Landfill
66	Rampere Landfill
67	Rathroeen Landfill
68	Youghal Landfill
69	Milltown Transfer Station
70	Benduff Landfill
71	Marlinstown Landfill
72	Coolcaslagh Transfer Station
73	Roscommon Landfill Facility
74	Donohill Landfill
75	Tramore Waste Disposal
76	Longpavement
77	Corranure Landfill
78	Ballaghveny Landfill
79	National Waste Management Ltd.
80	Carnegie J.W. & Co. Ltd.
82	Cussen & Co. (Crane Hire) Ltd.
83	Dempsey Drums Ltd
84	Southern Excavations Ltd
85	Burtonport Dredging Deposition
86	Kenmare Transfer Station
87	Caherciveen Transfer Station
88	Mr. Paul Joyce
89	Derryconnell Landfill
90	Balbane Landfill
91	Bailiborough Landfill
92	Belturbet Landfill
93	Ballyjamesduf Landfill
94	Keegan Oils Ltd T/A Allied Oils
95	Reduce Reuse Recycle Ltd
96	Erwin Cobbe Waste Disposal
97	Swalcliff Ltd.
98	Bushbury Ltd
101	Silvermines Landfill
102	Ballynacourty Waste Transfer Station
103	Knockharley Landfill
104	Alina Rentabin Limited
105	Returnbatt Limited
106	Bruscar Bhearna Teoranta
107	John Dunlea Waste Management and Recycling
108	Sir John Rogerson's Quay Gasworks
109	Central Waste Management Facility
110	Peat Ash Ltd.
111	Southeast Recycling Centre
112	National Recycling and Environmental Protection
113	KMK Metals Recycling Ltd.
114	Yellow Bins (Waste Disposal) Ltd
115	Soltec (Ireland) Limited
116	Waterford Utility Services (Waste Disposal) Ltd
117	Greenhill Compost Ltd
118	Marley Compost Ltd
119	Kabeyun Ltd
120	Foxfield Mushrooms
121	Kabeyun Ltd
122	Silver Lining Industries (Ireland) Ltd
123	Custom Compost Limited
124	Carbury Mushrooms Ltd
125	Glenalla Landfill
126	Muckish Landfill
127	Dunsink Civic Amenity
128	Shell (Seaview) Storage Facility

C2: ACTIVE LANDFILL SITES IN 1995 AND 1998

Authority	Site Name	Landfill Type	Quantity Deposited (Tonnes/annum)	
			1995	1998
Carlow County Council	Ballyellen Limes Works	Industrial/private		2,500
Carlow County Council	Billy Dixon Ltd.	Industrial/private		1,000
Carlow County Council	Dan Morrissey Ltd.	Industrial/private		15,000
Carlow County Council	Irish Sugar Company	Industrial/private		20,866
Carlow County Council	Kildavin Concrete Ltd.	Industrial/private		3,000
Carlow County Council	Liam Conway Ltd.	Industrial/private		4,000
Carlow County Council	*O'Brien Ardristan**	*Industrial/private*		
Carlow County Council	Powerstown	Municipal	19,900	32,575
Carlow County Council	Stone Development Ltd.	Industrial/private		10,000
Carlow County Council	Tom McDonald Ltd.	Industrial/private		8,000
Cavan County Council	Baileboro	Municipal	2,000	8,927
Cavan County Council	Ballyjamesduff	Municipal	1,000	1,489
Cavan County Council	Belturbet	Municipal	1,000	724
Cavan County Council	Corranure	Municipal	13,673	21,018
Clare County Council	*Air Rianta*	*Industrial/private*	*33,000*	
Clare County Council	Doora	Municipal	34,000	43,658
Clare County Council	*Ennistymon*	*Municipal*	*3000*	
Clare County Council	**Finsa**	**Industrial/private**		**48**
Clare County Council	Lisdeen	Municipal	1,174	1,800
Clare County Council	Moneypoint Ash disposal area	Industrial/private	33,000	120,000
Clare County Council	Syntex	Industrial/private	33,000	144
Clare County Council	Tradaree Point E. F. T.	Industrial/private	33,000	2,500
Clare County Council	Whitegate	Municipal	1,500	700
Cork Corporation	Kinsale Road Sanitary Landfill	Municipal	122,500	388,566
Cork County Council	Ballyguyroe	Municipal	24,000	23,430
Cork County Council	Bandon	Municipal	4,000	3,886
Cork County Council	Benduff	Municipal	13,000	13,993
Cork County Council	**Clountreem**	**Municipal**		**5,210**
Cork County Council	Derryconnell	Municipal	2,000	4,353
Cork County Council	**Irish Ispat Site**	**Industrial/private**		**9,000**
Cork County Council	**Irish Refining PLC**	**Industrial/private**		**1,207**
Cork County Council	**Irish Sugar, Mallow**	**Industrial/private**		**20,300**
Cork County Council	*Kealanine*	*Municipal*	*4,500*	
Cork County Council	Killbarry	Municipal	1,000	6,834
Cork County Council	*Macroom*	*Municipal*	*4,500*	
Cork County Council	Raffeen	Municipal	20,000	209,664
Cork County Council	Rossmore	Municipal	35,000	34,603
Cork County Council	Youghal	Municipal	8,000	25,035
Donegal County Council	Balbane	Municipal	7,340	5,500
Donegal County Council	Ballinacarrick	Municipal	37,440	23,000
Donegal County Council	Churchtown	Municipal	11,340	11,500
Donegal County Council	Drumabodan	Municipal	7,340	7,000
Donegal County Council	*Dungloe*	*Municipal*	*3,340*	
Donegal County Council	**Glenalla**	**Municipal**		**1,000**
Donegal County Council	**Knocknafaughter**	**Municipal**		
Donegal County Council	**Muckish**	**Municipal**		**4,400**
Dun Laoghaire-Rathdown C.C.	Ballyogan	Municipal	105,000	302,566
Fingal County Council	*Ardla*	*Industrial/private*	*25,000*	
Fingal County Council	Balleally	Municipal	246,000	387,530
Fingal County Council	Dunsink	Municipal	284,000	931,572
Galway Corporation	Carrowbrowne	Municipal	70,000	79,000
Galway County Council	Ballinasloe Landfill.	Municipal	27,402	24,229
Galway County Council	Inishmore/Aran	Municipal	590	590
Galway County Council	Portumna	Municipal	5,200	3,500
Galway County Council	Tuam	Municipal	14,765	20,644
Kerry County Council	*Ahascra*	*Municipal*	*1,000*	
Kerry County Council	**Ballyard**	**Industrial/private**		**25,000**
Kerry County Council	**Banemore,Listowel**	**Industrial/private**		**7,200**
Kerry County Council	Cahirciveen	Municipal	3,500	4,294
Kerry County Council	Coolcaslagh	Municipal	11,000	12,724

Authority	Site Name	Landfill Type	Quantity Deposited (Tonnes/annum)	
			1995	1998
Kerry County Council	*Dingle*	*Municipal*	*2,000*	
Kerry County Council	Kenmare	Municipal	3,000	2,091
Kerry County Council	Klinge Pharma and Co.	Industrial/private		130
Kerry County Council	*Leanamore*	*Municipal*	*1,000*	
Kerry County Council	Milltown	Municipal	5,000	6,996
Kerry County Council	North Kerry Landfill	Municipal	22,000	33,700
Kildare County Council	**Bushbury Ltd.**	**Industrial/private**		**250,000**
Kildare County Council	**Curryhills**	**Industrial/private**		**0**
Kildare County Council	**Farrells Kildare**	**Industrial/private**		**0**
Kildare County Council	**Millicent Cross**	**Industrial/private**		**0**
Kildare County Council	**Nephin Trading**	**Industrial/private**		**250,000**
Kildare County Council	**Newtown**	**Industrial/private**		**0**
Kildare County Council	Silliot Hill	Municipal	90,000	109,999
Kildare County Council	**The Range**	**Industrial/private**		**0**
Kildare County Council	**Toghers Pit**	**Industrial/private**		**0**
Kilkenny County Council	*Caherleske*	*Municipal*	*3,000*	
Kilkenny County Council	Dunmore	Municipal	29,000	27,998
Kilkenny County Council	Grannagh	Municipal	7,000	7,000
Kilkenny County Council	*Shellumsrath*	*Industrial/private*	*3,000*	
Laois County Council	Ballylinan	Industrial/private	450	2,500
Laois County Council	Kyletalesha	Municipal	23,000	38,016
Leitrim County Council	Carrick-on-Shannon	Municipal	2,500	4,470
Leitrim County Council	Manorhamilton	Municipal	2,200	2,200
Leitrim County Council	Mohill	Municipal	2,000	6,430
Limerick County Council	*Abbeyfeale*	*Municipal*	*1,000*	
Limerick County Council	**Aughinish Alumina**	**Industrial/private**		**1,047,378**
Limerick County Council	Croom	Municipal	16,500	10,000
Limerick County Council	Gortadroma	Municipal	40,000	90,700
Limerick County Council	**Irish Cement**	**Industrial/private**		**183,986**
Limerick County Council	*Longpavement*	*Municipal*	*30,000*	
Longford County Council	Drumlish	Industrial/private	9,010	9,010
Longford County Council	**Lanesboro, ESB**	**Industrial/private**		**23,200**
Louth County Council	Drogheda Landfill	Municipal	27,150	75,350
Louth County Council	Newry Road	Municipal	26,700	45,457
Louth County Council	**Premiere Periclase**	**Industrial/private**		**16,000**
Louth County Council	*Simonstown*	*Industrial/private*	*20*	24,689
Louth County Council	White River	Municipal	13,500	
Mayo County Council	*asahi*	*Industrial/private*	*75*	
Mayo County Council	**Beallcorrick, ESB**	**Industrial/private**		**11,633**
Mayo County Council	*Claremoris*	*Municipal*	*14,425*	
Mayo County Council	Derrinnumera	Municipal	24,929	29,950
Mayo County Council	Rathroeen, Ballina	Municipal	15,551	18,000
Mayo County Council	Shranbogroneen, Belmullet	Municipal	1,091	1,090
Meath County Council	Basketstown	Municipal	45,000	87,169
Meath County Council	**Gypsum Industries**	**Industrial/private**		**7,606**
Meath County Council	*Lismullen*	*Industrial/private*	*1,500*	
Meath County Council	Tara Mines Limited	Industrial/private		2,159,470
Monaghan County Council	**Knocnacran Quarry**	**Industrial/private**		**780**
Monaghan County Council	Scotch Corner	Municipal	20,000	28,730
Offaly County Council	*Birr*	*Municipal*	*5,700*	
Offaly County Council	Derryclure	Municipal	26,000	29,268
Offaly County Council	*Edenderry*	*Municipal*	*3,900*	
Offaly County Council	Ferbane	Industrial/private	8,000	30,000
Offaly County Council	Rhode	Industrial/private	1,500	20,000
Offaly County Council	Shannonbridge	Industrial/private	18,000	35,000
Roscommon County Council	Ballaghaderren	Municipal	3,534	7,135
Roscommon County Council	Boyle	Municipal	3,633	3,792
Roscommon County Council	Castlerea	Municipal	3,533	3,192
Roscommon County Council	*Rooskey*	*Industrial/private*	*2,434*	
Roscommon County Council	Roscommon	Municipal	6,433	5,959
Roscommon County Council	Strokestown	Municipal	3,033	3,014
Sligo County Council	*Marlowe*	*Municipal*	*4,000*	
South Dublin	**Arthurstown**	**Municipal**		**216,284**
South Dublin	*Friarstown*	*Municipal*	*10,000*	
Tipperary N.R. Co. Co.	Ballaghveny	Municipal	20,000	22,714

Authority	Site Name	Landfill Type	Quantity Deposited (Tonnes/annum)	
			1995	1998
Tipperary N.R. Co. Co.	*Templemore*	*Municipal*	*10,000*	
Tipperary N.R. Co. Co.	Thurles	Municipal	10,000	10,000
Tipperary S.R. Co. Co.	Connawarries Landfill Site	Municipal	15,000	31,800
Tipperary S.R. Co. Co.	Coole Adjoinment Landfill Site	Municipal	500	0
Tipperary S.R. Co. Co.	Garryshane/Donohill Landfill Site	Municipal		29,115
Waterford Corporation	Kilbarry	Municipal	78,000	28,650
Waterford County Council	Bawnard	Industrial/private	2,000	2,192
Waterford County Council	Dungarvan	Municipal	16,000	44,992
Waterford County Council	Tramore	Municipal	6,200	13,389
Waterford County Council	**Waterford Joinery**	**Industrial/private**		**48**
Waterford County Council	**Waterford Stanley**	**Industrial/private**		**430**
Westmeath County Council	Ballydonagh	Municipal	15,500	20,841
Westmeath County Council	Marlinstown	Municipal	18,000	18,031
Wexford County Council	Ballykeerogue	Municipal	10,000	10,000
Wexford County Council	Killurin	Municipal	45,000	54,688
Wicklow County Council	**Aghfarrell, Brittas**	**Industrial/private**		**100,000**
Wicklow County Council	**Annacurragh**	**Industrial/private**		**4,000**
Wicklow County Council	*Ballyduff*	*Industrial/private*	*8,000*	
Wicklow County Council	Ballymurtagh	Municipal	17,278	61,431
Wicklow County Council	**Dillonstown, Blessington**	**Industrial/private**		**100,000**
Wicklow County Council	**Drummin East**	**Industrial/private**		**200,000**
Wicklow County Council	*IFI Arklow*	*Industrial/private*	*1,000*	
Wicklow County Council	Killegar	Industrial/private	18,400	20,000
Wicklow County Council	**Kilmurray South**	**Industrial/private**		**95,000**
Wicklow County Council	**Noble Fassaroe**	**Industrial/private**		**46,000**
Wicklow County Council	Rampere	Municipal	5,746	6,229
Wicklow County Council	**Tinnapark**	**Industrial/private**		**0**
Wicklow County Council	*Woodfab*	*Industrial/private*		
TOTALS			**2,233,453**	**8,780,201**

*Italics indicate that the facility has closed between 1995 and 1998

*Bold indicates facilities that have either opened since 1995 or were not reported by local authorities in 1995. On-site landfills associated with IPC-licensed facilities have also been included.

C3: LOCAL AUTHORITY LANDFILLS – TONNES RECEIVED IN 1998

Authority	Site Name	Household	Commercial	Construction	Industrial	Others	TOTAL
Carlow County Council	Powerstown	13,200	9,300	0	5,000	5,075	32,575
Cavan County Council	Baileboro	4,104	2,558	358	358	1,549	8,927
Cavan County Council	Ballyjamesduff	553	146	0	0	790	1,489
Cavan County Council	Belturbet	409	184	0	72	59	724
Cavan County Council	Corranure	18,099	375	114	1,148	1,282	21,018
Clare County Council	Doora	20,220	12,158	0	7,745	3,535	43,658
Clare County Council	Lisdeen	1,440	280	0	80	0	1,800
Clare County Council	Whitegate	700	0	0	0	0	700
Cork Corporation	Kinsale Road Sanitary Landfill	53,522	61,614	240,000	26,250	7,180	388,566
Cork County Council	Ballyguyroe	13,339	3,085	0	1,000	6,006	23,430
Cork County Council	Bandon	2,886	1,000	0	0	0	3,886
Cork County Council	Benduff	8,617	3,523	898	11	944	13,993
Cork County Council	Clountreem	2,425	2,633	134	0	18	5,210
Cork County Council	Derryconnell	3,937	395	0	0	21	4,353
Cork County Council	Killbarry	4,000	1,545	600	259	430	6,834
Cork County Council	Raffeen	30,027	3,610	166,074	4,013	5,940	209,664
Cork County Council	Rossmore	18,659	390	6,124	8,725	705	34,603
Cork County Council	Youghal	6,606	5,041	8,817	3,238	1,333	25,035
Donegal County Council	Balbane	5,500	0	0	0	0	5,500

Authority	Site Name	Household	Commercial	Construction	Industrial	Others	TOTAL
Donegal County Council	Ballinacarrick	18,000	4,000	1,000	0	0	23,000
Donegal County Council	Churchtown	9,500	1,500	500	0	0	11,500
Donegal County Council	Drumabodan	5,600	1,000	400	0	0	7,000
Donegal County Council	Glenalla*	1,000	0	0	0	0	1,000
Donegal County Council	Knocknafaughter						
Donegal County Council	Muckish	4,400	0	0	0	0	4,400
Dun Laoghaire-Rathdown C.C.	Ballyogan	54,144	0	245,673	0	2,749	302,566
Fingal County Council	Balleally	53,275	117,000	159,547	3,000	54,708	387,530
Fingal County Council	Dunsink	0	0	931,572	0	0	931,572
Galway Corporation	Carrowbrowne	36,500	40,700	0	0	1,800	79,000
Galway County Council	Ballinasloe Landfill.	11,767	3,785	1,050	6,227	1,400	24,229
Galway County Council	Inishmore/Aran	590	0	0	0	0	590
Galway County Council	Portumna	3,500	0	0	0	0	3,500
Galway County Council	Tuam	20,644	0	0	0	0	20,644
Kerry County Council	Cahirciveen	2,163	1,851	0	280	0	4,294
Kerry County Council	Coolcaslagh	6,362	5,227	0	1,135	0	12,724
Kerry County Council	Kenmare	1,012	1,079	0	0	0	2,091
Kerry County Council	Milltown	3,130	3,484	0	382	0	6,996
Kerry County Council	North Kerry Landfill	15,933	13,406	0	4,361	0	33,700
Kildare County Council	Silliot Hill	42,161	26,606	100	22,052	19,080	109,999
Kilkenny County Council	Dunmore	16,039	6,146	647	2,363	2,803	27,998
Kilkenny County Council	Grannagh closed jluy 98	7,000	0	0	0	0	7,000
Laois County Council	Kyletalesha	19,848	6,336	3,768	4,032	4,032	38,016
Leitrim County Council	Carrick-on-Shannon	4,470	0	0	0	0	4,470
Leitrim County Council	Manorhamilton	2,200	0	0	0	0	2,200
Leitrim County Council	Mohill	6,430	0	0	0	0	6,430
Limerick County Council	Croom	10,000	0	0	0	0	10,000
Limerick County Council	Gortadroma	36,000	41,000	0	1,100	12,600	90,700
Louth County Council	Drogheda Landfill	7,000	18,000	50,000	350	0	75,350
Louth County Council	Newry Road	18,511	5,628	15,589	1,617	4,112	45,457
Louth County Council	White River	4,501	9,438	1,460	5,330	3,960	24,689
Mayo County Council	Derrinnumera	17,000	5,800	2,000	1,750	3,400	29,950
Mayo County Council	Rathroeen, Ballina	10,800	4,500	500	1,700	500	18,000
Mayo County Council	Shranbogroneen, Belmullet	1,090	0	0	0	0	1,090
Meath County Council	Basketstown	39,100	7,000	4,500	32,000	4,569	87,169
Monaghan County Council	Scotch Corner	10,630	5,459	172	9,079	3,390	28,730
Offaly County Council	Derryclure	14,000	6,500	622	4,750	3,396	29,268
Roscommon County Council	Ballaghaderren	2,796	1,959	0	0	2,380	7,135
Roscommon County Council	Boyle	2,602	310	0	0	880	3,792

Authority	Site Name	Household	Commercial	Construction	Industrial	Others	TOTAL
Roscommon County Council	Castlerea	1,325	807	0	0	1,060	3,192
Roscommon County Council	Roscommon	1,945	2,936	0	0	1,078	5,959
Roscommon County Council	Strokestown	801	1,463	0	0	750	3,014
South Dublin	Arthurstown	216,284	0	0	0	0	216,284
Tipperary N.R. Co. Co.	Ballaghveny	17,874		0	75	4,765	22,714
Tipperary N.R. Co. Co.	Thurles	10,000	0	0	0	0	10,000
Tipperary S.R. Co. Co.	Connawarries Landfill Site	9,100	5,600	600	5,300	11,200	31,800
Tipperary S.R. Co. Co.	Coole Adjoinment Landfill Site	0	0	0	0	0	0
Tipperary S.R. Co. Co.	Garryshane Landfill Site	12,400	3,700	300	2,900	9,815	29,115
Waterford Corporation	Kilbarry	18,000	10,000	0	300	350	28,650
Waterford County Council	Dungarvan	5,685	5,742	29,332	3,318	915	44,992
Waterford County Council	Tramore	6,100	3,434	3,500	165	190	13,389
Westmeath County Council	Ballydonagh	11,000	6,000	1,800	2,033	8	20,841
Westmeath County Council	Marlinstown	7,900	1,300	3,000	4,400	1,431	18,031
Wexford County Council	Ballykeerogue	5,000	5,000	0	0	0	10,000
Wexford County Council	Killurin	24,045	18,163	7,000	3,650	1,830	54,688
Wicklow County Council	Ballymurtagh	36,859	24,572	0	0	0	61,431
Wicklow County Council	Rampere	4,429	1,800	0	0	0	6,229
TOTALS		**1,116,688**	**536,068**	**1,887,751**	**181,548**	**194,018**	**3,916,073**

* An aggregate of 1000 tonnes was reported for Glenalla and Knocknafaughter in 1998.

C4: PRIVATE AND INDUSTRIAL LANDFILLS – TONNES RECEIVED IN 1998

Authority	Site Name	H/hold	Commercial	Construction	Industrial	Others	TOTAL
Carlow County Council	Ballyellen Limes Works	0	0	0	0	2,500	2,500
Carlow County Council	Billy Dixon Ltd.	0	0	0	0	1,000	1,000
Carlow County Council	Dan Morrissey Ltd.	0	0	0	0	15,000	15,000
Carlow County Council	Irish Sugar Company	0	0	0	20,866	0	20,866
Carlow County Council	Kildavin Concrete Ltd.	0	0	0	0	3,000	3,000
Carlow County Council	Liam Conway Ltd.	0	0	0	0	4,000	4,000
Carlow County Council	Stone Development Ltd.	0	0	0	0	10,000	10,000
Carlow County Council	Tom McDonald Ltd.	0	0	0	0	8,000	8,000
Clare County Council	Finsa	0	0	0	48	0	48
Clare County Council	Moneypoint Ash disposal area	0	0	0	120,000	0	120,000
Clare County Council	Syntex	0	0	0	91	53	144
Clare County Council	Tradaree Point E. F. T.	0	0	0	1,775	725	2,500
Cork County Council	Irish Ispat Site	0	0	0	9,000	0	9,000

Authority	Site Name	H/hold	Commercial	Construction	Industrial	Others	TOTAL
Cork County Council	Irish Refining PLC	0	0	1,207	0	0	1,207
Cork County Council	Irish Sugar, Mallow	0	0	0	20,300	0	20,300
Kerry County Council	Ballyard	0	0	25,000	0	0	25,000
Kerry County Council	Banemore,Listowel	0	0	0	7,200	0	7,200
Kerry County Council	Klinge Pharma and Co.	0	0	0	130	0	130
Kildare County Council	Bushbury Ltd.	0	0	0	0	250,000	250,000
Kildare County Council	Curryhills	0	0	0	0	0	
Kildare County Council	Farrells Kildare	0	0	0	0	0	
Kildare County Council	Millicent Cross	0	0	0	0	0	
Kildare County Council	Nephin Trading	0	0	250,000	0	0	250,000
Kildare County Council	Newtown	0	0	0	0	0	
Kildare County Council	The Range	0	0	0	0	0	
Kildare County Council	Toghers Pit	0	0	0	0	0	
Laois County Council	Ballylinan	0	0	0	0	2,500	2,500
Limerick County Council	Aughinish Alumina	0	0	0	1,047,378	0	1,047,378
Limerick County Council	Irish Cement	0	0	0	183,986	0	183,986
Longford County Council	Drumlish	9,010	0	0	0	0	9,010
Longford County Council	Lanesboro, ESB	0	0	0	23,200	0	23,200
Louth County Council	Premiere Periclase	0	0	0	16,000	0	16,000
Mayo County Council	Beallcorrick, ESB	0	0	0	11,633	0	11,633
Meath County Council	Gypsum Industries	0	0	0	7,606	0	7,606
Meath County Council	Tara Mines Limited	0	0	0	2,159,470	0	2,159,470
Monaghan County Council	Knocnacran Quarry	0	0	0	780	0	780
Offaly County Council	Ferbane	0	0	0	30,000	0	30,000
Offaly County Council	Rhode	0	0	0	20,000	0	20,000
Offaly County Council	Shannonbridge	0	0	0	35,000	0	35,000
Waterford County Council	Bawnard	0	0	0	2,192	0	2,192
Waterford County Council	Waterford Joinery	0	0	0	48	0	48
Waterford County Council	Waterford Stanley	0	0	0	430	0	430
Wicklow County Council	Aghfarrell, Brittas	0	0	100,000	0	0	100,000
Wicklow County Council	Annacurragh	0	4,000	0	0	0	4,000
Wicklow County Council	Dillonstown, Blessington	0	0	100,000	0	0	100,000
Wicklow County Council	Drummin East	0	0	200,000	0	0	200,000
Wicklow County Council	Killegar	0	20,000	0	0	0	20,000
Wicklow County Council	Kilmurray South	0	0	95,000	0	0	95,000
Wicklow County Council	Noble Fassaroe	0	0	46,000	0	0	46,000
Wicklow County Council	Tinnapark	0	0	0	0	0	
TOTALS		**9,010**	**24,000**	**817,207**	**3,717,133**	**296,778**	**4,864,128**

C5: ACTIVITIES FOR WHICH A WASTE LICENCE APPLICATION HAS BEEN RECEIVED

Register	Applicant Name	Facility	Applicant Type	Facility Type	Status of application
1-1	Kerry County Council	North Kerry Landfill Site	Public	Landfill	Licenced
1-2	Kerry County Council	North Kerry Landfill Site	Public	Landfill	Applied
2-1	Cork County Council	Ballyguyroe Landfill Site	Public	Landfill	Licenced
3-1	South Dublin County Council	Ballymount Bailing Station	Public	Transfer Station	Licenced
3-2	South Dublin County Council	Ballymount Bailing Station	Public	Transfer Station	Applied
4-1	South Dublin County Council	Arthurstown Landfill	Public	Landfill	Licenced
5-1	Wicklow County Council	Proposed East Wicklow Landfill	Public	Landfill	Applied
6-1	Limerick County Council	Proposed East Limerick Landfill Site	Public	Landfill	Applied
7-1	Gaelsafe Ltd.	Proposed Facility at GaelSafe Ltd.	Private	Healthcare Risk Waste Treatment	Abandoned
8-1	Gaelsafe Ltd.	Proposed Facility at GaelSafe Ltd.	Private	Healthcare Risk Waste Treatment	Abandoned
9-1	Fingal County Council	Balleally Landfill	Public	Landfill	PD issued
10-1	Meath County Council	Basketstown Landfill Facility	Public	Landfill	Licenced
11-1	Wicklow County Council	Ballymurtagh Landfill Facility	Public	Landfill	Applied
12-1	Cork Corporation	Kinsale Road Landfill	Public	Landfill	PD issued
13-1	Galway Corporation	Carrowbrowne Landfill Site	Public	Landfill	Applied
14-1	Kildare County Council	Silliot Hill Landfill	Public	Landfill	Applied
15-1	Dun Laoghaire-Rathdown County Council	Ballyogan Landfill Facility/Ballyogan Recycling Park	Public	Integrated Waste Management Facility	Applied
16-1	Wexford County Council	Killurin Landfill Site	Public	Landfill	Licenced
17-1	Limerick County Council	Gortadroma Landfill Site	Public	Landfill	Licenced
18-1	Waterford Corporation	Kilbarry Landfill Site	Public	Landfill	Applied
19-1	Tipperary SR County Council	Proposed Hardbog Landfill	Public	Landfill	PD issued
20-1	Monaghan County Council	Scotch Corner Landfill	Public	Landfill	Applied
21-1	Mayo County Council	Derrinumera Landfill	Public	Landfill	Licenced
22-1	Cork County Council	East Cork Landfill Site	Public	Landfill	PD issued
23-1	Cork County Council	Raffeen Landfill Site	Public	Landfill	Applied
24-1	Donegal County Council	Ballynacarrick Landfill Site	Public	Landfill	Applied
25-1	Carlow County Council	Powerstown Landfill Site	Public	Landfill	PD issued
26-1	Laois County Council	Kyletalesha Landfill	Public	Landfill	PD issued
27-1	Ballinasloe Urban District Council	Pollboy Landfill	Public	Landfill	Applied
28-1	Westmeath County Council	Ballydonagh Landfill	Public	Landfill	Licenced
29-1	Offaly County Council	Derryclure Landfill	Public	Landfill	Licenced
30-1	Kilkenny County Council	Dunmore Landfill Site	Public	Landfill	Licenced
31-1	Clare County Council	Doora Landfill Site	Public	Landfill	Applied
32-1	Waterford County Council	Dungarvan Waste Disposal Site	Public	Landfill	Applied
33-1	Drogheda Corporation	Drogheda Landfill	Public	Landfill	Licenced
34-1	Dundalk Urban District Council	Dundalk Landfill Amenity	Public	Landfill	Applied

Register	Applicant Name	Facility	Applicant Type	Facility Type	Status of application
35-1	Pipe & Drain Services Ltd.	Upper Sheriff Street	Private	Hazardous Waste Treatment & Transfer	Licenced
36-1	MinChem Chemicals Ltd	Tolka Quay Road	Private	Hazardous Waste Transfer Station	Licenced
37-1	Shannon Development	Tradaree Point E.T.P.	Private	Landfill	Applied
38-1	Southern Health Board	Cork University Hospital	Public	Healthcare Risk WT	Licenced
39-1	IPODEC Ireland Ltd.	Ballymount Cross (IPODEC)	Private	Transfer Station	Licenced
39-2	Southern Health Board	Cork University Hospital	Public	Healthcare Risk Waste Treatment	Applied
40-1	Sorundon Limited T/A Irish Environmental Services	520 Beech Road	Private	Healthcare Risk Waste Treatment & Hazardous Waste Transfer Station	Licenced
41-1	Shannon Environmental Services Ltd.	Smithstown Industrial Estate	Private	Hazardous Waste Treatment & Transfer	Applied
42-1	Dean Waste Co. Ltd.	Upper Sheriff Street	Private	Transfer Station	Applied
43-1	Landfill Management Ltd.	Killegar	Private	Transfer Station	Applied
44-1	Padraig Thornton Waste Disposal Ltd.	Thornton's Recycling Centre	Private	Transfer Station	Licenced
45-1	Dean Waste Co. Ltd.	Dean Waste Co. Ltd.	Private	Transfer Station	Applied
46-1	Tegral Building Products Liimited	Ballylinan Landfill Site	Private	Landfill	Licenced
47-1	Neiphen Trading Ltd.	Kerdiffstown	Private	Landfill	Applied
48-1	Tony Lawlor	Kilmurry South	Private	Landfill	Applied
49-1	Bord Na Mona	Clonbulloge Ash Repository	Private	Landfill	PD issued
50-1	Safeway Warehousing Ltd	Corrin	Private	Hazardous Waste Treatment & Transfer	Applied
51-1	Limerick County Council	Bunlicky	Public	Transfer Station	Licenced
52-1	Drogheda Port Company	Stagrennan Polder	Private	Dredging	Licenced
53-1	Noble Waste Disposal Limited	Fassaroe	Private	Integrated Waste Management Facility	Licenced
54-1	Eco-Safe Systems Limited	Unit 1	Private	Healthcare Risk Waste Treatment	Licenced
55-1	Sterile Technologies Ireland Limited		Private	Healthcare Risk Waste Treatment	Licenced
56-1	Mr Denis Doyle	Drummin East	Private	Landfill	Applied
57-1	Donegal County Council	Carndonagh Civic Amenity	Public	Transfer Station	Licenced
58-1	Waste Disposal (Sligo) Ltd.Waste Disposal (Sligo) Ltd	Deepwater Quay	Private	Transfer Station	Applied
59-1	Roscommon County Council	Ballaghaderreen Landfill	Public	Landfill	Applied
60-1	Louth County Council	Whiteriver Landfill Site	Public	Landfill	Applied
61-1	Mr Binman Limited	Luddenmore	Private	Transfer Station	Licenced
62-1	Donegal County Council	Churchtown Landfill	Public	Landfill	PD issued
63-1	Donegal County Council	Drumabodan Landfill Site	Public	Landfill	Applied
64-1	Leitrim County Council	Carrick On Shannon Landfill	Public	Landfill	Applied
65-1	Leitrim County Council	Mohill Landfill	Public	Landfill	Applied
66-1	Wicklow County Council	Rampere Landfill	Public	Landfill	Applied
67-1	Mayo County Council	Rathroeen Landfill	Public	Landfill	Applied
68-1	Cork County Council	Youghal Landfill	Public	Landfill	Applied
69-1	Kerry County Council	Milltown Transfer Station	Public	Transfer Station	Applied
70-1	Cork County Council	Benduff Landfill Site	Public	Landfill	Applied
71-1	Westmeath County Council	Marlinstown Landfill	Public	Landfill	Applied
72-1	Kerry County Council	Coolcaslagh Transfer Station	Public	Transfer Station	Applied
73-1	Roscommon County Council	Roscommon Landfill Facility	Public	Landfill	Applied
74-1	Tipperary SR County Council	Donohill Landfill	Public	Landfill	Applied

Register	Applicant Name	Facility	Applicant Type	Facility Type	Status of application
75-1	Waterford County Council	Tramore Waste Disposal Site	Public	Landfill	Applied
76-1	Limerick Corporation	Longpavement	Public	Integrated Waste Management Facility	Applied
77-1	Cavan County Council	Corranure Landfill	Public	Landfill	Applied
78-1	Tipperary NR County Council	Ballaghveny Landfill	Public	Landfill	Applied
79-1	National Waste Management Ltd.	Unit 41 Cookstown Industrial Estate	Private	Transfer Station	PD issued
80-1	Carnegie J.W. & Co. Ltd.	Dillonsdown	Private	Landfill	Applied
81-1	KTK Sand & Gravel Ltd.	KTK Pit	Private	Landfill	Licenced
82-1	Cussen & Co. (Crane Hire) Ltd.	Cussen & Co. (Crane Hire) Ltd.	Private	Transfer Station	Applied
83-1	Dempsey Drums Ltd	Lower Oriel Street	Private	Hazardous Waste Treatment	Licenced
84-1	Southern Excavations Ltd	Aghfarrell	Private	Landfill	Applied
85-1	Donegal County Council	Burtonport Dredging Deposition Site	Public	Dredging	Applied
86-1	Kerry County Council	Kenmare Transfer Station	Public	Transfer Station	Applied
87-1	Kerry County Council	Caherciveen Transfer Station	Public	Transfer Station	Applied
88-1	Paul Joyce	Corbally	Private	Landfill	Applied
89-1	Cork County Council	Derryconnell Landfill Site	Public	Landfill	Applied
90-1	Donegal County Council	Balbane Landfill Site	Public	Landfill	Applied
91-1	Cavan County Council	Bailiborough Landfill Site	Public	Landfill	Applied
92-1	Cavan County Council	Belturbet Landfill	Public	Landfill	Applied
93-1	Cavan County Council	Ballyjamesduf Landfill	Public	Landfill	Applied
94-1	Keegan Oils Ltd T/A Allied Oils	Toberona	Private	Hazardous Waste Treatment & Transfer	Applied
95-1	Reduce Reuse Recycle Ltd	Waste Management Centre	Private	Transfer Station	Applied
96-1	Erwin Cobbe Waste Disposal	Deer Park Cross	Private	Transfer Station	Applied
97-1	Swalcliff Ltd.	116 Sheriff Street Upper	Private	Transfer Station	Applied
98-1	Bushbury Ltd	The Lands	Private	Landfill	Applied
99-1	Safety Kleen Ireland Ltd.	Unit 5, Airton Road	Private	Hazardous Waste Transfer Station	Licenced
100-1	Dublin Docklands Development	Sir John Rogersons Quay Gasworks	Private	Soil Remediation	Licenced
101-1	Waste Management Operations Ireland Ltd.	Silvermines Landfill Facility	Private	Landfill	Applied
102-1	Mr. Thomas Leahy	Ballynacourty Waste Transfer Station	Private	Transfer Station	Applied
103-1	Meath County Council	Knockharley Landfill	Public	Landfill	Applied
104-1	Mr. Seamus Dolan	Alina Rentabin Limited	Private	Transfer Station	Applied
105-1	Returnbatt Limited	Returnbatt Limited	Private	Hazardous Waste Treatment & Transfer	Applied
106-1	Bruscar Bhearna Teoranta	Bruscar Bhearna Teoranta	Private	Transfer Station	Applied
107-1	John Dunlea Waste Management and Recycling	John Dunlea Waste Management and Recycling	Private	Transfer Station	Applied
108-1	Dublin Docklands Development	Sir John Rogerson's Quay Gasworks	Private	Soil Remediation	Applied
109-1	Clare County Council	Central Waste Management Facility	Public	Landfill	Applied
110-1	Peat Ash Limited	Peat Ash Ltd.	Private	Landfill	Applied
111-1	Southeast Reycling Co. Ltd.	Southeast Recycling Centre	Private	Transfer Station	Applied
112-1	National Recycling & Env Protection Ltd.	National Recycling and Environmental Protection Ltd	Private	Hazardous Waste Transfer Station	Applied
113-1	KMK Metals Recycling Ltd.	KMK Metals Recycling Ltd.	Private	Hazardous Waste Treatment & Transfer	Applied
114-1	Yellow Bins (Waste Disposal) Ltd.	Yellow Bins (Waste Disposal) Ltd	Private	Transfer Station	Applied

Register	Applicant Name	Facility	Applicant Type	Facility Type	Status of application
115-1	Soltec (Ireland) Limited	Soltec (Ireland) Limited	Private	Hazardous Waste Treatment	Applied
116-1	Waterford Utility Services (Waste Disposal) Ltd	Waterford Utility Services (Waste Disposal) Ltd	Private	Transfer Station	Applied
117-1	Greenhill Compost Ltd	Greenhill Compost Ltd	Private	Composting	Applied
118-1	Marley Compost Ltd	Marley Compost Ltd	Private	Composting	Applied
119-1	Kabeyun Ltd	Kabeyun Ltd	Private	Composting	Applied
120-1	Kabeyun Ltd	Foxfield Mushrooms	Private	Composting	Applied
121-1	Kabeyun Ltd	Kabeyun Ltd	Private	Composting	Applied
122-1	Silver Lining Industries (Ireland) Ltd	Silver Lining Industries (Ireland) Ltd	Private	Hazardous Waste Treatment & Transfer	Applied
123-1	Custom Compost Limited	Custom Compost Limited	Private	Composting	Applied
124-1	Carbury Mushrooms Ltd	Carbury Mushrooms Ltd	Private	Composting	Applied
125-1	Donegal County Council	Glenalla Landfill Site	Public	Landfill	Applied
126-1	Donegal County Council	Muckish Landfill Site	Public	Landfill	Applied
127-1	Fingal County Council	Dunsink Civic Amenity	Public	Recovery	Applied
128-1	Dun Laoghaire Harbour Company	Shell (Seaview) Storage Facility	Private	Soil Remediation	Applied
129-1	M.C.M. Ltd.	Landfill at M.C.M Ltd.	Private	Landfill	Applied
130-1	Euro Recyclers Ltd.	Transfer Station	Private	Transfer Station	Applied
131-1	Midland Waste Disposal Ltd.	Reclaimation of Inorganic Materials	Private	Transfer Station	Applied
132-1	David Mc Sweeney	Lotamore Landfill	Private	Landfill	Applied
133-1	Pipe and Drain Services	Recycling centre, Raheen	Private	Soil Remediation	Applied

C6: LOCAL AUTHORITY WASTE PERMITS NOTIFIED TO THE EPA UP TO OCTOBER 1999

Local Authority	Permit To	Activity Description
Cavan County Council	Gerard Martin	Waste recycling facility for the recycling of solid non-toxic waste.
	Cavan Waste Disposal Ltd.	Waste recycling facility for the recycling of solid non-toxic waste.
	Tony Comiskey	Waste recycling facility for the recycling of solid non-toxic waste.
Cork County Council	McGill Environmental Systems	Composting of biosolids.
	Pouladuff Dismantlers Ltd.	The dismantling/recovery of vehicles.
	Cork Metal Company	The processing of scrap metal.
	John A. O'Sullivan	The dismantling and recovery of vehicles.
	Glenanore Cartons	The sorting, baling and storage prior to recovery or disposal of cardboard, plastic packaging and timber pallet waste.
Dublin Corporation	Conservation Technology	Transfer station for fluorescent tubes, lamps and bulbs for export for recovery.
	O'Connor and Murphy Auto Dismantlers	The dismantling or recovery of vehicles.
	Dublin Sanitary Disposals Ltd.	The temporary storage of sanitary waste prior to submission to landfill.
	P&D Metals	Scrap metal or other metal waste recycling.
	I&H Mullen (Codest Investments Ltd.)	Scrap metal or other metal waste recycling.
	Pat McGovern t/a McGoverns Corner	Scrap metal or other metal waste recycling; and Storage of waste wood and timber materials for reuse.
	Isaac Mullen (Dawnlane Ltd)	Scrap metal or other metal waste recycling.
	Canon Hygiene (Ireland) Ltd.	The temporary storage of sanitary waste prior to submission to landfill.
	Alan Rowe Motors	The dismantling or recovery of vehicles.
	John W Hannay & Co Ltd. t/a Hannay Recycling	The recycling of non-hazardous waste paper, cardboard and plastics and the secure destruction of documents and data.
	Woods Hygiene Services (Longview Ltd.)	The temporary storage of sanitary waste prior to submission to landfill.
	North Dublin Autos Ltd. t/a South Dublin Autos Car Dismantlers	The dismantling or recovery of vehicles.
	Cerebal Palsy (Ireland) Ltd.	The recovery of waste textiles.
Dun Laoghaire-Rathdown County Council	Ivy Creek Ltd. t/a East Coast Recycling	The recovery of scrap metal or other metal waste
	J.V. O'Loughlin	The recovery of waste (other than hazardous waste) at a facility (other than a facility for the composting of waste where the amount of compost and waste held at the facility exceeds 1000 cubic metres at any time.
Fingal County Council	The Mann Organisation (Ireland) Ltd.	Recycling Facility.
	Fingal Recycling	Waste recovery/treatment facility.

Local Authority	Permit To	Activity Description
	Bailey Waste Paper Ltd.	Waste recycling/disposal facility.
Galway County Council	K&N Palletting	Pallet recycling
	Connaught Waste Recycling Company Ltd.	Recycling facility.
	Connaught Timber Products Ltd.	Pallet recycling.
	Galway Metal Company Ltd.	Metal recycling
Kilkenny County Council	New Ross Port Company	Recovery of waste (dredging material)
Leitrim County Council	Plastex Environmental Recycling	Recycling of in-organic materials (other than metals and metal components)
Limerick County Council	Munster Metal Company Ltd.	Recycling or reclamation of metals and metal compounds and storage.
Offaly County Council	Condron Car Dismantlers Ltd.	The dismantling or recovery of vehicles
	Irish Metal Refineries	Storage of waste intended for submission to the following activities referred to in the Fourth Schedule of the Waste Management Act, 1996, other than temporary storage, pending collection, on the premises where such waste is produced/; Recycling or reclamation of metals and metal compounds. Recycling or reclamation of other inorganic materials; Recovery of components from catalysts; and Exchange of waste for submission to any activity referred to in a proceeding paragraph of the Fourth Schedule of the Waste Management Act, 1996.
South Dublin County Council	Kerbside Dublin	Recycling facility.
	Gandon Enterprises t/a Rehab Recycling Partnership	Transfer/Recycling facility

APPENDIX D: CLOSED LANDFILLS

Authority	Site Name	Easting	Northing	Municipal	Hazardous	Inert	Unspecified
Carlow County Council	Haroldstown	270500	168600	√	×	√	
Carlow County Council	O'Brien Ardristan	283800	169800	×	×	×	√
Carlow County Council	Powerstown(partof)	270500	168600	√	×	√	
Clare County Council	Aer Rianta			×	×	×	√
Clare County Council	Ennistymon			×	×	×	√
Clare County Council	Whitegate			×	×	×	√
Cork County Council	Ballymagooley			√	×	√	
Cork County Council	Bantry Beach			√	×	√	
Cork County Council	Blarney			√	×	√	
Cork County Council	Carpark, Mallow			√	×	√	
Cork County Council	Carrigabrick, Fermoy			√	×	√	
Cork County Council	Carrigoon			√	×	√	
Cork County Council	Clonakility			×	×	×	√
Cork County Council	Clonmel Road, Mitchelstown			√	×	√	
Cork County Council	Cloyne			√	×	√	
Cork County Council	Cobh			√	×	√	
Cork County Council	Demesne, Mitchelstown			√	×	√	
Cork County Council	Drom North, Castletownbere			√	×	√	
Cork County Council	Egan's Cross, Glanworth			√	×	√	
Cork County Council	Foildarrig, Castletownbere			√	×	√	
Cork County Council	Glan, Schull			√	×	√	
Cork County Council	Grange, Fermoy			√	×	√	
Cork County Council	Kealanine, Bantry	97000	55000	√	×	√	
Cork County Council	Kilclogh (North Cork)			√	×	√	
Cork County Council	Kinsale			√	×	√	
Cork County Council	Macroom	163500	74800	√	×	√	
Cork County Council	Mount Nagle			√	×	√	
Cork County Council	Pike, Fermoy			√	×	√	
Cork County Council	Rahan	163000	98000	√	×	√	
Cork County Council	Riverstick			√	×	√	
Cork County Council	Sallys Cross	140000	103000	√	×	√	
Cork County Council	Skibbereen			×	×	×	√
Cork County Council	Velvetstown			√	×	√	
Donegal County Council	Ballyratten			√	×	×	
Donegal County Council	Dungloe/Dunglor	177000	411500	×	×	×	√
Donegal County Council	Glenties			√	×	×	
Donegal County Council	Narran			√	×	×	
Dublin Corporation	Artane School			√	×	√	
Dublin Corporation	Ballyboggan Quarry			√	×	√	
Dublin Corporation	Bond Road			√	×	√	
Dublin Corporation	Bull Island Causeway			√	×	√	
Dublin Corporation	Californian Hills			√	×	√	
Dublin Corporation	Clontarf Park			√	×	√	
Dublin Corporation	East Wall Road			√	×	√	
Dublin Corporation	Edenmore Park			√	×	√	
Dublin Corporation	Irishtown			√	×	√	
Dublin Corporation	James Larkin Road			√	×	√	
Dublin Corporation	Labre Park			√	×	√	
Dublin Corporation	Lauders Lane			√	×	√	
Dublin Corporation	Longmeadows			√	×	√	
Dublin Corporation	Merville Quarries			√	×	√	
Dublin Corporation	Mt. Temple Schools			√	×	√	
Dublin Corporation	Sundrive Road			√	×	√	
Dublin Corporation	Tolka Valley			√	×	√	
Dun Laoghaire-Rathdown	Cork Great	326630	219562	√	×	×	

Authority	Site Name	Easting	Northing	Municipal	Hazardous	Inert	Unspecified
C.C.							
Dun Laoghaire-Rathdown C.C.	Johnstown Road/Rochestown Ave.	323663	225971	√	×	×	
Dun Laoghaire-Rathdown C.C.	Kilbogget	324002	224386	√	×	×	
Dun Laoghaire-Rathdown C.C.	Kingston	315720	225455	√	×	√	
Dun Laoghaire-Rathdown C.C.	Pottery Road	323132	226683	√	×	√	
Dun Laoghaire-Rathdown C.C.	Quarry Hill	314216	220886	√	×	√	
Dun Laoghaire-Rathdown C.C.	The Scalp	321687	220020	√	×	√	
Dun Laoghaire-Rathdown C.C.	Tibradden Lane	314120	223888	√	×	√	
Dun Laoghaire-Rathdown C.C.	Ticknock	316288	225075	√	×	√	
Fingal County Coun	Blanchardstown Hospital			×	×	×	√
Fingal County Council	Ardla			×	×	×	√
Fingal County Council	Baldoyle	319025	241050	√	×	√	
Fingal County Council	Baldoyle Rd	318528	240148	√	×	√	
Fingal County Council	Baleally			×	×	×	√
Fingal County Council	Balgriffin	318480	242890	√	×	√	
Fingal County Council	Ballymadum	306425	254819	√	×	√	
Fingal County Council	Ballymun	315151	241383	√	×	√	
Fingal County Council	Balrickard Quarry	318321	257439	√	×	√	
Fingal County Council	Balseskin	312350	241440	√	×	√	
Fingal County Council	Barnageera	323148	260854	√	×	√	
Fingal County Council	Bayside	318403	240512	√	×	√	
Fingal County Council	Belcamp	318888	241464	√	×	√	
Fingal County Council	Blanchardstown	309100	238200	√	×	√	
Fingal County Council	Brooks End	317275	255585	√	×	√	
Fingal County Council	Burrow	318834	239772	√	×	√	
Fingal County Council	Clonshaugh Bridge	317867	242778	√	×	√	
Fingal County Council	Courtlough	320385	258676	√	×	√	
Fingal County Council	Curkeen Quarry	325768	257784	√	×	×	
Fingal County Council	Dardistown	317504	241658	√	×	√	
Fingal County Council	Donabate	322464	249700	√	×	√	
Fingal County Council	Dunsink			×	×	×	
Fingal County Council	Dunsoghly	311600	243000	×	×	×	
Fingal County Council	Dunsoughly	312486	242977	√	×	√	
Fingal County Council	Fancourt	319736	263429	√	×	√	
Fingal County Council	Garristown	314372	259644	√	×	√	
Fingal County Council	Gerrardstown	314839	256682	√	×	√	
Fingal County Council	Howth	319313	238919	√	×	√	
Fingal County Council	Hynestown, The Naul	313790	260079	√	×	√	
Fingal County Council	Kileek	313690	245833	√	×	√	
Fingal County Council	Kilsough North	320928	262753	√	×	√	
Fingal County Council	Lacy's	319095	239321	√	×	√	
Fingal County Council	Malahide	322816	245664	√	×	√	
Fingal County Council	Malahide Boatyard	322614	246449	√	×	√	
Fingal County Council	Parslicktown			×	×	×	√
Fingal County Council	Porterstown	306500	237800	√	×	√	
Fingal County Council	Portmarnack	319570	241968	√	×	√	
Fingal County Council	Portmarnack Bridge	319436	241735	√	×	√	
Fingal County Council	Portmarnack Track	319498	242193	√	×	√	
Fingal County Council	Rockmouna	312495	241303	√	×	√	
Fingal County Council	Sandyhills	312958	243378	√	×	√	
Fingal County Council	Screen House			×	×	×	√
Fingal County Council	Seatown	318900	247802	√	×	√	
Fingal County Council	Skerries	325806	259344	√	×	√	
Fingal County Council	The Nevitt	318120	256820	√	×	√	
Fingal County Council	Toberstool	316307	265836	√	×	√	

Authority	Site Name	Easting	Northing	Municipal	Hazardous	Inert	Unspecified
Fingal County Council	Townparks, Skerries			×	×	×	√
Fingal County Council	Townspark	324858	260187	√	×	√	
Fingal County Council	Unidare Finglas	313307	240262	√	×	√	
Fingal County Council	Westown, The Naul	311859	260199	√	×	√	
Galway Corporation	Carrowbrowne	132500	231400	√	×	√	
Galway County Council	Ballygar	81830	533125	√	×	√	
Galway County Council	Clifden	65000	250600	×	×	×	
Galway County Council	Cornamona	92715	533040	√	×	√	
Galway County Council	Dunmore	84500	533725	√	×	√	
Galway County Council	Glenamaddy	83000	533600	√	×	√	
Galway County Council	Gort	84908	530401	√	×	√	
Galway County Council	Headford	90616	532812	√	×	√	
Galway County Council	New inn	83010	531750	√	×	√	
Galway County Council	Oughterard	91856	532542	√	×	√	
Galway County Council	Woodford	82510	530300	√	×	√	
Kerry County Council	Ahascra	90400	138200	√	×	√	
Kerry County Council	Ballymullen			√	×	√	
Kerry County Council	Blennerville			√	×	√	
Kerry County Council	Caherina			√	×	√	
Kerry County Council	Dingle	44800	101000	√	×	√	
Kerry County Council	Leanamore	100000	140000	√	×	√	
Kerry County Council	Mulgraves Bridge			√	×	√	
Kerry County Council	Rockfield			√	×	√	
Kerry County Council	Tralee	82581	113685	√	×	√	
Kildare County Council	Carrigeen	287800	226400	×	×	×	√
Kildare County Council	Digby Bridge	286600	223700	√	×	×	
Kildare County Council	Donore			√	×	×	
Kildare County Council	Gavins Pit	295500	221000	×	√	×	
Kildare County Council	Moone	279800	192200	√	×	×	
Kildare County Council	Mountrice, Monsterevin	265700	213600	√	×	√	
Kildare County Council	Oghill, Monsterevin	267100	209800	√	×	√	
Kildare County Council	Ovidstown			×	×	√	
Kildare County Council	Rahadoon	299800	223400	√	×	×	
Kildare County Council	Robertstown	279500	225500	√	×	√	
Kildare County Council	Waterstown, Sallins	287300	222900	√	×	×	
Kildare County Council	Wolfstown, Eadstown	296200	217200	×	×	√	
Kildare County Council	Yellowbog	283800	207100	√	×	×	
Kilkenny County Council	Caherleske	248000	139000	√	×	√	
Kilkenny County Council	Grannagh (closed 1998)	255300	113400	√	×	√	
Kilkenny County Council	Sheestown	255200	150550	√	×	×	
Kilkenny County Council	Shellumsrath	249100	154000	√	×	√	
Laois County Council	Ballydine	243569	184882	√	×	×	
Laois County Council	Ballymorris	253000	210655	√	×	×	
Laois County Council	Oughaval	259000	194300	√	×	×	
Laois County Council	Rathdowney Road	240667	178023	√	×	×	
Laois County Council	Trumera	237984	194665	√	×	×	
Leitrim County Council	Ballinamore			√	×	×	
Leitrim County Council	Drumkeran			√	×	×	
Leitrim County Council	Drumshambo			√	×	×	
Leitrim County Council	Kittyclogher			√	×	×	
Limerick Corporation	Dock Road	55500	56300	√	×	×	
Limerick Corporation	Longpavement	57000	59300	√	×	×	
Limerick County Council	Abbeyfeale	112940	129675	√	×	×	
Limerick County Council	Churchtown	127500	134600	√	×	×	
Longford County Council	Ballymahon No 1	215625	257000	√	×	×	
Longford County Council	Ballymahon No 2	215625	257000	√	×	×	
Longford County Council	Cartron	217500	276000	√	×	×	
Longford County Council	Drumlish			×	×	×	√
Longford County Council	Edgeworthstown	227000	272000	√	×	×	
Longford County Council	Granard	233750	281250	√	×	×	
Longford County Council	Lanesborough	201000	260250	√	×	×	
Longford County Council	Longford No 1	213750	275000	√	×	×	

Authority	Site Name	Easting	Northing	Municipal	Hazardous	Inert	Unspecified
Longford County Council	Longford No 2	213750	275000	√	×	×	
Louth County Council	Boycetown	289400	313000	√	√	×	
Louth County Council	Carlington	319000	311800	√	×	×	
Louth County Council	Omeath	316800	312500	√	×	×	
Louth County Council	Simonstown			√	√	×	
Louth County Council	Site A Collon Road	306860	276445	√	×	×	
Louth County Council	Site B Mell, Drogheda	307297	276756	√	×	×	
Louth County Council	Site C Mell, Drogheda	307350	276646	√	×	×	
Louth County Council	Site E Drogheda	307897	276428	√	×	×	
Louth County Council	Site F Marsh Road Drogheda	310525	275455	√	×	×	
Mayo County Council	Asahi			×	×	×	
Mayo County Council	Ballyhaunis			√	×	×	
Mayo County Council	Castlebar			√	×	×	
Mayo County Council	Claremorris	135000	274800	√	×	×	
Mayo County Council	Foxford			√	×	×	
Mayo County Council	Kiltimagh			√	×	×	
Mayo County Council	Swinford			√	×	×	
Meath County Council	Drumcondra	288150	289750	√	×	×	
Meath County Council	Girley	270100	268500	√	×	×	
Meath County Council	Laytown	316000	271100	√	×	×	
Meath County Council	Lismullen	292500	262200	×	×	×	
Meath County Council	Midland Waste	294000	239500	√	×	×	
Meath County Council	Old Castle	254850	280000	√	×	×	
Meath County Council	Sheaf of Wheat	320000	243150	√	×	×	
Meath County Council	Wilkinstown	285800	278000	√	×	×	
Monaghan County Council	Killycronaghan	258260	329934	√	×	×	
Monaghan County Council	Killyneill	272587	335818	√	×	√	
Monaghan County Council	Tiragarvan	281325	305157	√	×	√	
Offaly County Council	Ballydaly	226000	235000	√	×	×	
Offaly County Council	Birr	204000	206200	√	×	×	
Offaly County Council	Clara	226800	233300	√	×	×	
Offaly County Council	Edenderry	264300	231000	√	×	×	
Offaly County Council	Ferbane	212500	224500	√	×	×	
Offaly County Council	Kilcormac	218300	215500	√	×	×	
Roscommon County Council	Boyle (Closed 1998)	176400	303800	√	×	×	
Roscommon County Council	Castlerea (closed 1999)	168100	277700	√	×	×	
Roscommon County Council	Irish Country Meats	204500	288600	×	×	×	√
Roscommon County Council	Strokestown (Closed 1999)	192600	279600	√	×	×	
Sligo County Council	Finisklin	168200	336750	√	×	×	
Sligo County Council	Marlowe	165730	314500	√	×	×	
South Dublin County Council	Cromers	299500	235500	×	×	√	
South Dublin County Council	Waterstown	308500	235500	×	×	√	
Tipperary N.R. Co. Co.	Borrisokane			√	×	√	
Tipperary N.R. Co. Co.	Cloughjordan			√	×	√	
Tipperary N.R. Co. Co.	Nenagh			√	×	√	
Tipperary N.R. Co. Co.	Silvermines			√	×	√	
Tipperary N.R. Co. Co.	Templemore			√	×	×	
Tipperary N.R. Co. Co.	Templeree			√	×	√	
Tipperary S.R. Co. Co.	Cahirabbey			√	×	×	
Tipperary S.R. Co. Co.	Cashel			√	×	×	
Tipperary S.R. Co. Co.	Tipperary			√	×	×	
Waterford County Council	Kilmacthomas	239400	107000	√	×	√	
Waterford County Council	Lismore	204500	96400	√	×	√	
Waterford County Council	Portlaw	247400	114900	√	×	√	
Westmeath County Council	Ballinlig			√	×	√	
Westmeath County Council	Castlepollard			√	×	√	
Westmeath County Council	Delvin			√	×	√	
Westmeath County Council	Golden Island			√	×	√	

Authority	Site Name	Easting	Northing	Municipal	Hazardous	Inert	Unspecified
Westmeath County Council	Moate			√	×	√	
Wexford County Council	Ballinabearna			√	×	√	
Wexford County Council	Ballycanew	313300	151700	√	×	√	
Wexford County Council	Boolaboy, The Ballagh	307800	138400	√	×	√	
Wexford County Council	Bunclody	291100	156300	√	×	√	
Wexford County Council	Camolin	305900	152200	√	×	√	
Wexford County Council	Carcur	303000	123000	×	×	×	√
Wexford County Council	Carrigneagh	316100	157400	√	×	√	
Wexford County Council	Castlebridge			√	×	√	
Wexford County Council	Courttown	319200	156000	√	×	√	
Wexford County Council	Duncannon	275000	108500	√	×	√	
Wexford County Council	Enniscorthy	296600	138700	√	×	√	
Wexford County Council	Ferns	302000	148800	√	×	√	
Wexford County Council	Fethard-on-Sea	279400	104100	√	×	√	
Wexford County Council	Finchogue	300700	140800	√	×	√	
Wexford County Council	Gorey	314400	159000	√	×	√	
Wexford County Council	Gorteen	317200	167800	√	×	√	
Wexford County Council	Kilmore	296400	103600	√	×	√	
Wexford County Council	Marshmeadows	271200	126000	√	×	√	
Wexford County Council	Mountdaniel	308000	139300	√	×	√	
Wexford County Council	Rosslare Harbour			√	×	√	
Wexford County Council	Rosslare Strand	309200	115500	√	×	√	
Wexford County Council	Taghmon	293200	120000	√	×	√	
Wicklow County Council	Ballyduff, Ashford	327000	189200	×	×	×	√
Wicklow County Council	Coolroe			√	×	×	
Wicklow County Council	Fassaroe No 1			√	×	×	
Wicklow County Council	Fassaroe No 2			√	×	×	
Wicklow County Council	Fassaroe No 3			√	×	×	
Wicklow County Council	Fassaroe No 4			×	×	×	√
Wicklow County Council	IFI Arklow			×	×	×	√
Wicklow County Council	Kilmullin			√	×	×	
Wicklow County Council	Littlerock			√	×	×	
Wicklow County Council	Maherymore			√	×	×	
Wicklow County Council	Newtown			√	×	×	
Wicklow County Council	Scalp			√	×	×	
Wicklow County Council	Woodfab			×	×	×	√

APPENDIX E: WASTE CHARACTERISATION STUDIES

INTRODUCTION

Results of waste characterisation surveys conducted on household and commercial waste are presented here.

E1: MUNICIPAL WASTE

By far the greatest amount of information available is for household waste and summary results are presented for each county. Table D1 presents a summary of waste arisings and population statistics for each local authority, and shows how the pairing procedure described in Chapter Two was applied.

Table D1: Pairing Table for Waste Characterisation Surveys

Local Authority	Waste Arisings	Population	% Urban Population	Urban	Rural
Carlow County Council	12,200	41,616	46.1	Survey Post 1995	Survey Post 1995
Cavan County Council	17,472	52,944	16.9	Mayo	Mayo
Clare County Council	31,813	94,006	35.3	Survey 1995	Survey 1995
Cork Corporation	63,764	127,187	100	Survey 1995	
Cork County Council	119,343	293,323	43.2	Offaly	Survey 1995
Donegal County Council	26,000	129,994	21.8	Survey Post 1995	Survey Post 1995
Dublin Corporation	166,333	481,854	100	Survey Post 1995	
Dun Laoghaire- Rathdown C.C.	53,867	189,999	98.4	Survey Post 1995	Tipperary NR
Fingal County Council	55,993	167,683	90.5	Dublin Corporation	Tipperary NR
Galway Corporation	18,500	57,241	100	Dublin Corporation	
Galway County Council	27,647	131,613	12.4	Donegal	Donegal
Kerry County Council	26,845	126,130	31.2	Survey Post 1995	Survey Post 1995
Kildare County Council	42,471	134,992	60.6	Survey Post 1995	Tipperary NR
Kilkenny C.C. & Corporation	24,559	75,336	29.2	Survey 1995	Kerry
Laois County Council	23,352	52,945	29.1	Offaly	Kerry
Leitrim County Council	9,667	25,057	6.1	Donegal	Mayo
Limerick Corporation	26,000	52,039	100	Dublin Corporation	
Limerick County Council	29,500	113,003	25.5	Mayo	Kerry
Longford County Council	15,079	30,166	23.2	Survey 1995	Survey 1995
Louth County Council	28,671	92,166	63.5	Survey 1995	Kerry
Mayo County Council	52,356	111,524	21.3	Survey Post 1995	Survey Post 1995
Meath County Council	34,650	109,732	33.9	Survey 1995	Survey 1995
Monaghan County Council	16,933	51,313	28.1	Offaly	Tipperary NR
Offaly County Council	17,510	59,117	36.6	Survey Post 1995	Tipperary NR
Roscommon County Council	18,535	51,975	18.4	Mayo	Mayo
Sligo County Council	17,890	55,821	33.2	Survey 1995	Tipperary NR
South Dublin County Council	70,400	218,728	96.7	Survey 1995	Tipperary NR
Tipperary County Council (NR)	18,403	58,021	33.3	Survey Post 1995	Survey Post 1995
Tipperary County Council (SR)	27,291	75,514	40.4	Survey 1995	Survey 1995
Waterford Corporation	18,280	42,540	100	Survey Post 1995	
Waterford County Council	12,401	52,140	27.5	Kerry	Survey 1995
Westmeath County Council	23,020	63,314	42.4	Survey 1995	Survey 1995
Wexford County Council	29,045	104,371	32	Offaly	Tipperary NR
Wicklow County Council	45,066	102,683	58.4	Survey 1995	Survey 1995
TOTALS	**1,220,856**	**3,626,087**			

E1.1 RURAL HOUSEHOLD WASTE CHARACTERISATION

Rural – Organic Matter

Local Authority	% Organic Matter	Total Waste Arisings	% Population Rural	Total Waste Arisings - Rural	Weighted Organic Matter Content
Carlow County Council	13.39	12,200	53.90	6,575.80	880.69
Cavan County Council	36.37	17,472	83.10	14,519.23	5,281.11
Clare County Council	29.80	31,813	64.70	20,583.01	6,132.74
Cork Corporation	0.00	63,764		-	-
Cork County Council	36.87	119,343	56.80	67,786.82	24,993.43
Donegal County Council	27.19	26,000	78.20	20,332.00	5,529.14
Dublin Corporation	0.00	166,333		-	-
Dun Laoghaire - Rathdown C.C.	44.75	53,867	1.60	861.87	385.65
Fingal County Council	44.75	55,993	9.50	5,319.34	2,380.16
Galway Corporation	0.00	18,500		-	-
Galway County Council	27.19	27,647	87.60	24,218.77	6,586.12
Kerry County Council	26.79	26,845	68.80	18,469.36	4,948.77
Kildare County Council	44.75	42,471	39.40	16,733.57	7,487.50
Kilkenny C.C. & Kilkenny Corp	26.79	24,559	70.80	17,387.77	4,658.96
Laois County Council	26.79	23,352	70.90	16,556.57	4,436.25
Leitrim County Council	36.37	9,667	93.90	9,077.31	3,301.71
Limerick Corporation	0.00	26,000		-	-
Limerick County Council	26.79	29,500	74.50	21,977.50	5,888.76
Longford County Council	27.44	15,079	76.80	11,580.67	3,178.31
Louth County Council	26.79	28,671	36.50	10,464.92	2,804.02
Mayo County Council	36.37	52,356	78.70	41,204.17	14,987.26
Meath County Council	35.34	34,650	66.10	22,903.65	8,095.15
Monaghan County Council	44.75	16,933	71.90	12,174.83	5,447.67
Offaly County Council	44.75	17,510	63.40	11,101.34	4,967.34
Roscommon County Council	36.37	18,535	81.60	15,124.56	5,501.28
Sligo County Council	44.75	17,890	66.80	11,950.52	5,347.31
South Dublin County Council	44.75	70,400	3.30	2,323.20	1,039.53
Tipperary County Council (NR)	44.75	18,403	66.70	12,274.80	5,492.41
Tipperary County Council (SR)	29.97	27,291	59.60	16,265.44	4,875.40
Waterford Corporation	0.00	18,280		-	-
Waterford County Council	20.92	12,401	72.50	8,990.73	1,880.49
Westmeath County Council	27.29	23,020	57.60	13,259.52	3,617.88
Wexford County Council	44.75	29,045	68.00	19,750.60	8,837.48
Wicklow County Council	29.09	45,066	41.60	18,747.46	5,453.96
Totals	29.02	1,220,856		488,515.33	164,416.47
Weighted % Organic Matter in the Rural Waste Stream					**33.66**

Rural – Paper

Local Authority	%Paper	% Paper Material Packaging	Total Waste Arisings	% Population Rural	Total Waste Arisings - Rural	Weighted Total Content	Weighted Packaging Content
Carlow County Council	7.94	3.97	12,200	53.90	6,575.80	521.89	260.94
Cavan County Council	18.68	7.12	17,472	83.10	14,519.23	2,712.43	1,033.50
Clare County Council	12.29	3.17	31,813	64.70	20,583.01	2,529.76	651.60
Cork Corporation	0.00	0.00	63,764		-	-	-
Cork County Council	16.56	4.50	119,343	56.80	67,786.82	11,223.91	3,051.01
Donegal County Council	14.73	5.48	26,000	78.20	20,332.00	2,995.68	1,115.04
Dublin Corporation	0.00	0.00	166,333		-	-	-
Dun Laoghaire - Rathdown C.C.	13.43	4.19	53,867	1.60	861.87	115.71	36.11
Fingal County Council	13.43	4.19	55,993	9.50	5,319.34	714.14	222.84
Galway Corporation	0.00	0.00	18,500		-	-	-
Galway County Council	14.73	5.48	27,647	87.60	24,218.77	3,568.35	1,328.20
Kerry County Council	20.31	6.87	26,845	68.80	18,469.36	3,751.19	1,268.04
Kildare County Council	13.43	4.19	42,471	39.40	16,733.57	2,246.55	701.01
Kilkenny C.C. & Kilkenny Corp	20.31	6.87	24,559	70.80	17,387.77	3,531.51	1,193.78
Laois County Council	20.31	6.87	23,352	70.90	16,556.57	3,362.69	1,136.71
Leitrim County Council	18.68	7.12	9,667	93.90	9,077.31	1,695.79	646.14
Limerick Corporation	0.00	0.00	26,000		-	-	-
Limerick County Council	20.31	6.87	29,500	74.50	21,977.50	4,463.70	1,508.90
Longford County Council	15.89	4.19	15,079	76.80	11,580.67	1,840.64	485.13
Louth County Council	20.31	6.87	28,671	36.50	10,464.92	2,125.46	718.48
Mayo County Council	18.68	7.12	52,356	78.70	41,204.17	7,697.60	2,932.97
Meath County Council	16.03	6.23	34,650	66.10	22,903.65	3,672.16	1,425.96
Monaghan County Council	13.43	4.19	16,933	71.90	12,174.83	1,634.52	510.03
Offaly County Council	13.43	4.19	17,510	63.40	11,101.34	1,490.40	465.06
Roscommon County Council	18.68	7.12	18,535	81.60	15,124.56	2,825.51	1,076.59
Sligo County Council	13.43	4.19	17,890	66.80	11,950.52	1,604.41	500.64
South Dublin County Council	13.43	4.19	70,400	3.30	2,323.20	311.90	311.90
Tipperary County Council (NR)	13.43	4.19	18,403	66.70	12,274.80	1,647.94	514.22
Tipperary County Council (SR)	14.04	6.18	27,291	59.60	16,265.44	2,284.35	1,004.69
Waterford Corporation	0.00	0.00	18,280		-	-	-
Waterford County Council	12.58	3.42	12,401	72.50	8,990.73	1,130.75	307.27
Westmeath County Council	22.87	3.41	23,020	57.60	13,259.52	3,032.99	452.23
Wexford County Council	13.43	4.19	29,045	68.00	19,750.60	2,651.60	827.40
Wicklow County Council	12.77	3.69	45,066	41.60	18,747.46	2,394.01	691.23
Totals	13.5	4.4	1,220,856		488,515.3	79,777.5	26,377.6
Weighted % Paper in the Rural Waste Stream							**16.33**
Weighted % Paper Packaging in the Rural Waste Stream							**5.40**

Rural – Textile

Local Authority	% Textile	% Textile Material Packaging	Total Waste Arisings	% Population Rural	Total Waste Arisings - Rural	Weighted Total Content	Weighted Packaging Content
Carlow County Council	0.00	0.00	12,200	53.90	6,575.80	0.00	0.00
Cavan County Council	1.10	0.01	17,472	83.10	14,519.23	159.63	2.04
Clare County Council	6.52	0.00	31,813	64.70	20,583.01	1,341.54	0.00
Cork Corporation	0.00	0.00	63,764		-	-	-
Cork County Council	3.05	3.05	119,343	56.80	67,786.82	2,064.57	2,064.57
Donegal County Council	0.88	0.00	26,000	78.20	20,332.00	179.51	0.00
Dublin Corporation	0.00	0.00	166,333		-	-	-
Dun Laoghaire - Rathdown C.C.	4.52	0.03	53,867	1.60	861.87	38.99	0.23
Fingal County Council	4.52	0.03	55,993	9.50	5,319.34	240.61	1.44
Galway Corporation	0.00	0.00	18,500		-	-	-
Galway County Council	0.88	0.00	27,647	87.60	24,218.77	213.83	0.00
Kerry County Council	2.99	1.08	26,845	68.80	18,469.36	551.39	198.77
Kildare County Council	4.52	0.03	42,471	39.40	16,733.57	756.91	4.53
Kilkenny C.C. & Kilkenny Corp	2.99	1.08	24,559	70.80	17,387.77	519.10	187.13
Laois County Council	2.99	1.08	23,352	70.90	16,556.57	494.28	178.18
Leitrim County Council	1.10	0.01	9,667	93.90	9,077.31	99.80	1.27
Limerick Corporation	0.00	0.00	26,000		-	-	-
Limerick County Council	2.99	1.08	29,500	74.50	21,977.50	656.12	236.52
Longford County Council	1.42	0.18	15,079	76.80	11,580.67	164.09	21.40
Louth County Council	2.99	1.08	28,671	36.50	10,464.92	312.42	112.62
Mayo County Council	1.10	0.01	52,356	78.70	41,204.17	453.00	5.78
Meath County Council	3.86	0.06	34,650	66.10	22,903.65	883.34	12.62
Monaghan County Council	4.52	0.03	16,933	71.90	12,174.83	550.70	3.30
Offaly County Council	4.52	0.03	17,510	63.40	11,101.34	502.15	3.01
Roscommon County Council	1.10	0.01	18,535	81.60	15,124.56	166.28	2.12
Sligo County Council	4.52	0.03	17,890	66.80	11,950.52	540.56	3.24
South Dublin County Council	4.52	0.03	70,400	3.30	2,323.20	105.09	0.63
Tipperary County Council (NR)	4.52	0.03	18,403	66.70	12,274.80	555.23	3.32
Tipperary County Council (SR)	0.91	0.00	27,291	59.60	16,265.44	148.06	0.00
Waterford Corporation	0.00	0.00	18,280		-	-	-
Waterford County Council	1.06	0.00	12,401	72.50	8,990.73	95.25	0.00
Westmeath County Council	6.78	0.05	23,020	57.60	13,259.52	898.44	6.03
Wexford County Council	4.52	0.03	29,045	68.00	19,750.60	893.38	5.35
Wicklow County Council	11.83	0.36	45,066	41.60	18,747.46	2,216.99	67.44
Totals	2.86	0.28	1,220,856		488,515.33	15,801.23	3,121.54
Weighted % Textile in the Rural Waste Stream							**3.23**
Weighted % Textile Packaging in the Rural Waste Stream							**0.64**

Rural – Plastics

Local Authority	%Plastic	% Plastic Material Packaging	Total Waste Arisings	%Population Rural	Total Waste Arisings - Rural	Weighted Total Content	Weighted Packaging Content
Carlow County Council	19.84	19.54	12,200	53.90	6,575.80	1,304.72	1,285.15
Cavan County Council	9.68	8.38	17,472	83.10	14,519.23	1,405.12	1,216.99
Clare County Council	17.88	17.88	31,813	64.70	20,583.01	3,679.64	3,679.64
Cork Corporation	0.00	0.00	63,764		-	-	-
Cork County Council	12.90	12.85	119,343	56.80	67,786.82	8,744.33	8,708.66
Donegal County Council	6.51	5.99	26,000	78.20	20,332.00	1,324.41	1,218.06
Dublin Corporation	0.00	0.00	166,333		-	-	-
Dun Laoghaire - Rathdown C.C.	12.83	9.54	53,867	1.60	861.87	110.57	82.25
Fingal County Council	12.83	9.54	55,993	9.50	5,319.34	682.45	507.63
Galway Corporation	0.00	0.00	18,500		-	-	-
Galway County Council	6.51	5.99	27,647	87.60	24,218.77	1,577.59	1,450.91
Kerry County Council	12.28	8.13	26,845	68.80	18,469.36	2,267.45	1,502.17
Kildare County Council	12.83	9.54	42,471	39.40	16,733.57	2,146.84	1,596.91
Kilkenny C.C. & Kilkenny Corp	12.28	8.13	24,559	70.80	17,387.77	2,134.67	1,414.20
Laois County Council	12.28	8.13	23,352	70.90	16,556.57	2,032.62	1,346.60
Leitrim County Council	9.68	8.38	9,667	93.90	9,077.31	878.47	760.85
Limerick Corporation	0.00	0.00	26,000		-	-	-
Limerick County Council	12.28	8.13	29,500	74.50	21,977.50	2,698.14	1,787.50
Longford County Council	6.75	5.27	15,079	76.80	11,580.67	781.20	609.98
Louth County Council	12.28	8.13	28,671	36.50	10,464.92	1,284.76	851.15
Mayo County Council	9.68	8.38	52,356	78.70	41,204.17	3,987.59	3,453.69
Meath County Council	7.88	6.83	34,650	66.10	22,903.65	1,804.53	1,564.77
Monaghan County Council	12.83	9.54	16,933	71.90	12,174.83	1,561.97	1,161.86
Offaly County Council	12.83	9.54	17,510	63.40	11,101.34	1,424.25	1,059.42
Roscommon County Council	9.68	8.38	18,535	81.60	15,124.56	1,463.70	1,267.73
Sligo County Council	12.83	9.54	17,890	66.80	11,950.52	1,533.20	1,140.46
South Dublin County Council	12.83	9.54	70,400	3.30	2,323.20	298.06	221.71
Tipperary County Council (NR)	12.83	9.54	18,403	66.70	12,274.80	1,574.80	1,171.40
Tipperary County Council (SR)	7.61	7.61	27,291	59.60	16,265.44	1,237.36	1,237.36
Waterford Corporation	0.00	0.00	18,280		-	-	-
Waterford County Council	10.32	10.32	12,401	72.50	8,990.73	927.96	927.96
Westmeath County Council	6.37	6.00	23,020	57.60	13,259.52	844.17	795.93
Wexford County Council	12.83	9.54	29,045	68.00	19,750.60	2,533.91	1,884.83
Wicklow County Council	17.09	10.93	45,066	41.60	18,747.46	3,203.25	2,048.40
Totals	9.86	7.92	1,220,856		488,515.33	55,447.75	45,954.16
Weighted % Plastics in the Rural Waste Stream							**11.35**
Weighted % Plastics Packaging in the Rural Waste Stream							**9.41**

Rural – Glass

Local Authority	% Glass	% Glass Material Packaging	Total Waste Arisings	% Population Rural	Total Waste Arisings - Rural	Weighted Textile Content	Weighted Packaging Content
Carlow County Council	14.19	14.19	12,200	53.90	6,575.80	932.88	932.88
Cavan County Council	7.68	7.68	17,472	83.10	14,519.23	1,114.53	1,114.53
Clare County Council	10.43	10.43	31,813	64.70	20,583.01	2,146.46	2,146.46
Cork Corporation	0.00	0.00	63,764		-	-	-
Cork County Council	3.65	3.65	119,343	56.80	67,786.82	2,475.42	2,475.42
Donegal County Council	4.53	4.27	26,000	78.20	20,332.00	920.47	867.32
Dublin Corporation	0.00	0.00	166,333		-	-	-
Dun Laoghaire - Rathdown C.C.	4.49	4.49	53,867	1.60	861.87	38.67	38.67
Fingal County Council	4.49	4.49	55,993	9.50	5,319.34	238.69	238.69
Galway Corporation	0.00	0.00	18,500		-	-	-
Galway County Council	4.53	4.27	27,647	87.60	24,218.77	1,096.43	1,033.12
Kerry County Council	8.42	7.94	26,845	68.80	18,469.36	1,554.29	1,466.14
Kildare County Council	4.49	4.49	42,471	39.40	16,733.57	750.87	750.87
Kilkenny C.C. & Kilkenny Corp	8.42	7.94	24,559	70.80	17,387.77	1,463.27	1,380.28
Laois County Council	8.42	7.94	23,352	70.90	16,556.57	1,393.32	1,314.30
Leitrim County Council	7.68	7.68	9,667	93.90	9,077.31	696.80	696.80
Limerick Corporation	0.00	0.00	26,000		-	-	-
Limerick County Council	8.42	7.94	29,500	74.50	21,977.50	1,849.51	1,744.62
Longford County Council	4.81	4.81	15,079	76.80	11,580.67	556.47	556.47
Louth County Council	8.42	7.94	28,671	36.50	10,464.92	880.67	830.73
Mayo County Council	7.68	7.68	52,356	78.70	41,204.17	3,162.94	3,162.94
Meath County Council	4.16	4.05	34,650	66.10	22,903.65	952.74	927.50
Monaghan County Council	4.49	4.49	16,933	71.90	12,174.83	546.31	546.31
Offaly County Council	4.49	4.49	17,510	63.40	11,101.34	498.14	498.14
Roscommon County Council	7.68	7.68	18,535	81.60	15,124.56	1,161.00	1,161.00
Sligo County Council	4.49	4.49	17,890	66.80	11,950.52	536.24	536.24
South Dublin County Council	4.49	4.49	70,400	3.30	2,323.20	104.25	104.25
Tipperary County Council (NR)	4.49	4.49	18,403	66.70	12,274.80	550.79	550.79
Tipperary County Council (SR)	5.01	5.01	27,291	59.60	16,265.44	814.33	814.33
Waterford Corporation	0.00	0.00	18,280		-	-	-
Waterford County Council	3.66	3.66	12,401	72.50	8,990.73	328.78	328.78
Westmeath County Council	2.27	2.27	23,020	57.60	13,259.52	301.49	301.49
Wexford County Council	4.49	4.49	29,045	68.00	19,750.60	886.24	886.24
Wicklow County Council	4.86	4.23	45,066	41.60	18,747.46	910.40	792.38
Totals	5.15	5.05	1,220,856		488,515.33	28,862.38	28,197.67
Weighted % Glass in the Rural Waste Stream							**5.91**
Weighted % Glass Packaging in the Rural Waste Stream							**5.77**

Rural – Ferrous Metals

Local Authority	% Metals- Fe	% Metal-Fe Material Packaging	Total Waste Arisings	% Population Rural	Total Waste Arisings - Rural	Weighted Total Content	Weighted Packaging Content
Carlow County Council	6.55	6.55	12,200	53.90	6,575.80	430.56	430.56
Cavan County Council	2.53	2.41	17,472	83.10	14,519.23	367.71	349.39
Clare County Council	2.23	2.23	31,813	64.70	20,583.01	459.96	459.96
Cork Corporation	0.00	0.00	63,764		-	-	-
Cork County Council	1.97	1.73	119,343	56.80	67,786.82	1,332.54	1,169.52
Donegal County Council	3.19	2.69	26,000	78.20	20,332.00	649.55	546.91
Dublin Corporation	0.00	0.00	166,333		-	-	-
Dun Laoghaire - Rathdown C.C.	2.12	2.12	53,867	1.60	861.87	18.29	18.29
Fingal County Council	2.12	2.12	55,993	9.50	5,319.34	112.86	112.86
Galway Corporation	0.00	0.00	18,500		-	-	-
Galway County Council	3.19	2.69	27,647	87.60	24,218.77	773.72	651.46
Kerry County Council	2.25	1.18	26,845	68.80	18,469.36	415.04	218.64
Kildare County Council	2.12	2.12	42,471	39.40	16,733.57	355.04	355.04
Kilkenny C.C. & Kilkenny Corp	2.25	1.18	24,559	70.80	17,387.77	390.73	205.84
Laois County Council	2.25	1.18	23,352	70.90	16,556.57	372.05	196.00
Leitrim County Council	2.53	2.41	9,667	93.90	9,077.31	229.89	218.43
Limerick Corporation	0.00	0.00	26,000		-	-	-
Limerick County Council	2.25	1.18	29,500	74.50	21,977.50	493.87	260.18
Longford County Council	2.40	1.51	15,079	76.80	11,580.67	278.24	174.79
Louth County Council	2.25	1.18	28,671	36.50	10,464.92	235.16	123.89
Mayo County Council	2.53	2.41	52,356	78.70	41,204.17	1,043.53	991.52
Meath County Council	2.04	2.04	34,650	66.10	22,903.65	466.91	466.91
Monaghan County Council	2.12	2.12	16,933	71.90	12,174.83	258.31	258.31
Offaly County Council	2.12	2.12	17,510	63.40	11,101.34	235.54	235.54
Roscommon County Council	2.53	2.41	18,535	81.60	15,124.56	383.04	363.95
Sligo County Council	2.12	2.12	17,890	66.80	11,950.52	253.55	253.55
South Dublin County Council	2.12	2.12	70,400	3.30	2,323.20	49.29	49.29
Tipperary County Council (NR)	2.12	2.12	18,403	66.70	12,274.80	260.44	260.44
Tipperary County Council (SR)	1.63	1.63	27,291	59.60	16,265.44	264.39	264.39
Waterford Corporation	0.00	0.00	18,280		-	-	-
Waterford County Council	1.50	1.50	12,401	72.50	8,990.73	135.20	135.20
Westmeath County Council	3.37	3.37	23,020	57.60	13,259.52	446.20	446.20
Wexford County Council	2.12	2.12	29,045	68.00	19,750.60	419.05	419.05
Wicklow County Council	3.06	3.06	45,066	41.60	18,747.46	573.21	573.21
Totals	2.11	1.87	1,220,856		488,515.33	11,703.86	10,209.32
Weighted % Ferrous Metal in the Rural Waste Stream							**2.40**
Weighted % Ferrous Metal Packaging in the Rural Waste Stream							**2.09**

Rural – Non Ferrous Metals

Local Authority	% Metals – Non Ferrous	% Metals - Non Ferrous Material Packaging	Total Waste Arisings	% Population Rural	Total Waste Arisings - Rural	Weighted Total Content	Weighted Packaging Content
Carlow County Council	0.60	0.60	12,200	53.90	6,575.80	39.14	39.14
Cavan County Council	0.27	0.06	17,472	83.10	14,519.23	38.85	9.12
Clare County Council	0.74	0.00	31,813	64.70	20,583.01	153.32	0.00
Cork Corporation	0.00	0.00	63,764		-	-	-
Cork County Council	0.73	0.66	119,343	56.80	67,786.82	496.09	447.81
Donegal County Council	0.85	0.61	26,000	78.20	20,332.00	173.11	124.39
Dublin Corporation	0.00	0.00	166,333		-	-	-
Dun Laoghaire - Rathdown C.C.	1.17	0.40	53,867	1.60	861.87	10.12	3.42
Fingal County Council	1.17	0.40	55,993	9.50	5,319.34	62.43	21.13
Galway Corporation	0.00	0.00	18,500		-	-	-
Galway County Council	0.85	0.61	27,647	87.60	24,218.77	206.20	148.17
Kerry County Council	1.26	0.76	26,845	68.80	18,469.36	233.06	141.07
Kildare County Council	1.17	0.40	42,471	39.40	16,733.57	196.40	66.48
Kilkenny C.C. & Kilkenny Corp	1.26	0.76	24,559	70.80	17,387.77	219.41	132.81
Laois County Council	1.26	0.76	23,352	70.90	16,556.57	208.92	126.46
Leitrim County Council	0.27	0.06	9,667	93.90	9,077.31	24.29	5.70
Limerick Corporation	0.00	0.00	26,000		-	-	-
Limerick County Council	1.26	0.76	29,500	74.50	21,977.50	277.33	167.87
Longford County Council	0.62	0.25	15,079	76.80	11,580.67	71.34	28.54
Louth County Council	1.26	0.76	28,671	36.50	10,464.92	132.05	79.93
Mayo County Council	0.27	0.06	52,356	78.70	41,204.17	110.25	25.89
Meath County Council	0.91	0.25	34,650	66.10	22,903.65	208.22	56.79
Monaghan County Council	1.17	0.40	16,933	71.90	12,174.83	142.90	48.37
Offaly County Council	1.17	0.40	17,510	63.40	11,101.34	130.30	44.10
Roscommon County Council	0.27	0.06	18,535	81.60	15,124.56	40.47	9.50
Sligo County Council	1.17	0.40	17,890	66.80	11,950.52	140.26	47.47
South Dublin County Council	1.17	0.40	70,400	3.30	2,323.20	27.27	9.23
Tipperary County Council (NR)	1.17	0.40	18,403	66.70	12,274.80	144.07	48.76
Tipperary County Council (SR)	0.46	0.39	27,291	59.60	16,265.44	74.03	63.45
Waterford Corporation	0.00	0.00	18,280		-	-	-
Waterford County Council	0.62	0.34	12,401	72.50	8,990.73	55.31	30.73
Westmeath County Council	0.50	0.32	23,020	57.60	13,259.52	66.33	42.21
Wexford County Council	1.17	0.40	29,045	68.00	19,750.60	231.81	78.46
Wicklow County Council	1.35	0.90	45,066	41.60	18,747.46	252.89	168.59
Totals	0.77	0.37	1,220,856		488,515.33	4,166.17	2,215.60
Weighted % Non Ferrous Metal in the Rural Waste Stream							**0.85**
Weighted % Non Ferrous Metal Packaging in the Rural Waste Stream							**0.45**

Rural – Other Metals

Local Authority	% Other Metals	% Other Metal Material Packaging	Total Waste Arisings	% Population Rural	Total Waste Arisings - Rural	Weighted Total Content	Weighted Packaging Content
Carlow County Council	0.00	0.00	12,200	53.90	6,575.80	0.00	0.00
Cavan County Council	0.47	0.00	17,472	83.10	14,519.23	68.25	0.00
Clare County Council	0.00	0.00	31,813	64.70	20,583.01	0.00	0.00
Cork Corporation	0.00	0.00	63,764		-	-	-
Cork County Council	0.12	0.12	119,343	56.80	67,786.82	78.93	78.93
Donegal County Council	0.37	0.06	26,000	78.20	20,332.00	74.38	11.55
Dublin Corporation	0.00	0.00	166,333		-	-	-
Dun Laoghaire - Rathdown C.C.	1.91	0.00	53,867	1.60	861.87	16.50	0.00
Fingal County Council	1.91	0.00	55,993	9.50	5,319.34	101.81	0.00
Galway Corporation	0.00	0.00	18,500		-	-	-
Galway County Council	0.37	0.06	27,647	87.60	24,218.77	88.59	13.76
Kerry County Council	0.09	0.00	26,845	68.80	18,469.36	16.63	0.00
Kildare County Council	1.91	0.00	42,471	39.40	16,733.57	320.29	0.00
Kilkenny C.C. & Kilkenny Corp	0.09	0.00	24,559	70.80	17,387.77	15.66	0.00
Laois County Council	0.09	0.00	23,352	70.90	16,556.57	14.91	0.00
Leitrim County Council	0.47	0.00	9,667	93.90	9,077.31	42.67	0.00
Limerick Corporation	0.00	0.00	26,000		-	-	-
Limerick County Council	0.09	0.00	29,500	74.50	21,977.50	19.79	0.00
Longford County Council	0.00	0.00	15,079	76.80	11,580.67	0.00	0.00
Louth County Council	0.09	0.00	28,671	36.50	10,464.92	9.42	0.00
Mayo County Council	0.47	0.00	52,356	78.70	41,204.17	193.68	0.00
Meath County Council	0.55	0.00	34,650	66.10	22,903.65	126.19	0.00
Monaghan County Council	1.91	0.00	16,933	71.90	12,174.83	233.03	0.00
Offaly County Council	1.91	0.00	17,510	63.40	11,101.34	212.49	0.00
Roscommon County Council	0.47	0.00	18,535	81.60	15,124.56	71.09	0.00
Sligo County Council	1.91	0.00	17,890	66.80	11,950.52	228.74	0.00
South Dublin County Council	1.91	0.00	70,400	3.30	2,323.20	44.47	0.00
Tipperary County Council (NR)	1.91	0.00	18,403	66.70	12,274.80	234.95	0.00
Tipperary County Council (SR)	0.00	0.00	27,291	59.60	16,265.44	0.00	0.00
Waterford Corporation	0.00	0.00	18,280		-	-	-
Waterford County Council	1.06	0.00	12,401	72.50	8,990.73	95.25	0.00
Westmeath County Council	0.00	0.00	23,020	57.60	13,259.52	0.00	0.00
Wexford County Council	1.91	0.00	29,045	68.00	19,750.60	378.04	0.00
Wicklow County Council	0.85	0.00	45,066	41.60	18,747.46	160.16	0.00
Totals	0.67	0.01	1,220,856		488,515.33	2,845.92	104.25
Weighted % Other Metals in the Rural Waste Stream							**0.58**
Weighted % Other Metal Packaging in the Rural Waste Stream							**0.02**

Rural – Other Materials

Local Authority	% Other	% Other Packaging	Total Waste Arisings	% Population Rural	Total Waste Arisings - Rural	Weighted Other Content	%Weighted Other Packaging
Carlow County Council	37.50	2.88	12,200	53.90	6,575.80	2,465.93	189.18
Cavan County Council	23.22	1.32	17,472	83.10	14,519.23	3,371.62	192.28
Clare County Council	20.11	1.30	31,813	64.70	20,583.01	4,139.60	268.31
Cork Corporation	100.00	0.00	63,764		-	-	
Cork County Council	24.16	1.22	119,343	56.80	67,786.82	16,377.60	825.71
Donegal County Council	41.74	1.38	26,000	78.20	20,332.00	8,485.75	280.17
Dublin Corporation	100.00	0.00	166,333		-	-	
Dun Laoghaire - Rathdown C.C.	14.78	3.44	53,867	1.60	861.87	127.38	29.65
Fingal County Council	14.78	3.44	55,993	9.50	5,319.34	786.18	182.98
Galway Corporation	100.00	0.00	18,500		-	-	
Galway County Council	41.74	1.38	27,647	87.60	24,218.77	10,107.93	333.73
Kerry County Council	25.62	3.49	26,845	68.80	18,469.36	4,731.55	645.27
Kildare County Council	14.78	3.44	42,471	39.40	16,733.57	2,473.17	575.61
Kilkenny C.C. & Kilkenny Corp	25.62	3.49	24,559	70.80	17,387.77	4,454.46	607.48
Laois County Council	25.62	3.49	23,352	70.90	16,556.57	4,241.52	578.44
Leitrim County Council	23.22	1.32	9,667	93.90	9,077.31	2,107.91	120.21
Limerick Corporation	100.00	0.00	26,000		-	-	
Limerick County Council	25.62	3.49	29,500	74.50	21,977.50	5,630.28	767.84
Longford County Council	40.67	1.80	15,079	76.80	11,580.67	4,710.39	208.68
Louth County Council	25.62	3.49	28,671	36.50	10,464.92	2,680.94	365.62
Mayo County Council	23.22	1.32	52,356	78.70	41,204.17	9,568.32	545.68
Meath County Council	29.23	2.42	34,650	66.10	22,903.65	6,694.43	555.24
Monaghan County Council	14.78	3.44	16,933	71.90	12,174.83	1,799.40	418.80
Offaly County Council	14.78	3.44	17,510	63.40	11,101.34	1,640.75	381.87
Roscommon County Council	23.22	1.32	18,535	81.60	15,124.56	3,512.18	200.30
Sligo County Council	14.78	3.44	17,890	66.80	11,950.52	1,766.25	411.08
South Dublin County Council	14.78	3.44	70,400	3.30	2,323.20	343.36	79.92
Tipperary County Council (NR)	14.78	3.44	18,403	66.70	12,274.80	1,814.18	422.24
Tipperary County Council (SR)	40.38	1.37	27,291	59.60	16,265.44	6,567.51	222.09
Waterford Corporation	100.00	0.00	18,280		-	-	
Waterford County Council	48.29	0.00	12,401	72.50	8,990.73	4,341.73	0.00
Westmeath County Council	30.56	1.27	23,020	57.60	13,259.52	4,052.02	168.83
Wexford County Council	14.78	3.44	29,045	68.00	19,750.60	2,919.08	679.39
Wicklow County Council	19.11	1.21	45,066	41.60	18,747.46	3,582.58	227.60
Totals	36.10	2.06	1,220,856		488,515.33	125,494.01	10,484.22
Weighted % Other Materials in the Rural Waste Stream							**25.69**
Weighted % Other Packaging in the Rural Waste Stream							**2.15**

E1.2 URBAN HOUSEHOLD WASTE CHARACTERISATION

Urban – Organic Matter

Local Authority	% Organic Matter Material	Total Waste Arisings	% Population Urban	Total Waste Arisings - Urban	Weighted Organic Matter Content
Carlow County Council	5.69	12,200	46.10	5,624.20	319.82
Cavan County Council	37.15	17,472	16.90	2,952.77	1,096.94
Clare County Council	33.95	31,813	35.30	11,229.99	3,812.14
Cork Corporation	38.27	63,764	100.00	63,764.00	24,404.09
Cork County Council	23.70	119,343	43.20	51,556.18	12,218.47
Donegal County Council	18.24	26,000	21.80	5,668.00	1,033.97
Dublin Corporation	34.64	166,333	100.00	166,333.00	57,613.17
Dun Laoghaire - Rathdown C.C.	31.30	53,867	98.40	53,005.13	16,590.61
Fingal County Council	34.64	55,993	90.50	50,673.67	17,551.96
Galway Corporation	34.64	18,500	100.00	18,500.00	6,407.89
Galway County Council	18.24	27,647	12.40	3,428.23	625.38
Kerry County Council	24.44	26,845	31.20	8,375.64	2,046.59
Kildare County Council	23.95	42,471	60.60	25,737.43	6,165.21
Kilkenny C.C. & Kilkenny Corp	22.12	24,559	29.20	7,171.23	1,586.56
Laois County Council	23.70	23,352	29.10	6,795.43	1,610.47
Leitrim County Council	18.24	9,667	6.10	589.69	107.57
Limerick Corporation	34.64	26,000	100.00	26,000.00	9,005.68
Limerick County Council	37.15	29,500	25.50	7,522.50	2,794.57
Longford County Council	34.93	15,079	23.20	3,498.33	1,222.02
Louth County Council	13.61	28,671	63.50	18,206.09	2,478.64
Mayo County Council	37.15	52,356	21.30	11,151.83	4,142.85
Meath County Council	23.32	34,650	33.90	11,746.35	2,738.77
Monaghan County Council	23.70	16,933	28.10	4,758.17	1,127.65
Offaly County Council	23.70	17,510	36.60	6,408.66	1,518.81
Roscommon County Council	37.15	18,535	18.40	3,410.44	1,266.96
Sligo County Council	27.37	17,890	33.20	5,939.48	1,625.70
South Dublin County Council	47.70	70,400	96.70	68,076.80	32,472.63
Tipperary County Council (NR)	53.31	18,403	33.30	6,128.20	3,267.11
Tipperary County Council (SR)	33.77	27,291	40.40	11,025.56	3,722.92
Waterford Corporation	17.06	18,280	100.00	18,280.00	3,118.97
Waterford County Council	24.44	12,401	27.50	3,410.28	833.30
Westmeath County Council	18.07	23,020	42.40	9,760.48	1,764.18
Wexford County Council	23.70	29,045	32.00	9,294.40	2,202.71
Wicklow County Council	34.02	45,066	58.40	26,318.54	8,953.66
Totals	28.46	1,220,856		732,340.67	237,447.97
Weighted % Organic Matter in the Urban Waste Stream					**32.42**

Urban – Paper

Local Authority	% Paper Material	% Paper Material Packaging	Total Waste Arisings	% Population Urban	Total Waste Arisings - Urban	Weight Material Content	Weighted Packaging Content
Carlow County Council	20.25	5.69	12,200	46.10	5,624.20	1,138.88	319.82
Cavan County Council	16.68	6.44	17,472	16.90	2,952.77	492.55	190.15
Clare County Council	18.01	6.99	31,813	35.30	11,229.99	2,023.05	784.45
Cork Corporation	21.58	5.42	63,764	100.00	63,764.00	13,760.49	3,455.78
Cork County Council	19.61	6.81	119,343	43.20	51,556.18	10,108.26	3,511.73
Donegal County Council	17.00	4.84	26,000	21.80	5,668.00	963.49	274.18
Dublin Corporation	23.34	4.01	166,333	100.00	166,333.00	38,816.59	6,673.34
Dun Laoghaire - Rathdown C.C.	25.90	6.60	53,867	98.40	53,005.13	13,728.33	3,498.34
Fingal County Council	23.34	4.01	55,993	90.50	50,673.67	11,825.55	2,033.05
Galway Corporation	23.34	4.01	18,500	100.00	18,500.00	4,317.29	742.23
Galway County Council	17.00	4.84	27,647	12.40	3,428.23	582.76	165.83
Kerry County Council	19.62	7.30	26,845	31.20	8,375.64	1,643.32	611.43
Kildare County Council	15.09	3.64	42,471	60.60	25,737.43	3,883.82	937.51
Kilkenny C.C. & Kilkenny Corp	26.74	6.30	24,559	29.20	7,171.23	1,917.87	452.07
Laois County Council	19.61	6.81	23,352	29.10	6,795.43	1,332.33	462.87
Leitrim County Council	17.00	4.84	9,667	6.10	589.69	100.24	28.53
Limerick Corporation	23.34	4.01	26,000	100.00	26,000.00	6,067.54	1,043.13
Limerick County Council	16.68	6.44	29,500	25.50	7,522.50	1,254.82	484.43
Longford County Council	21.71	6.64	15,079	23.20	3,498.33	759.57	232.42
Louth County Council	11.15	0.00	28,671	63.50	18,206.09	2,030.44	0.00
Mayo County Council	16.68	6.44	52,356	21.30	11,151.83	1,860.23	718.15
Meath County Council	14.82	5.13	34,650	33.90	11,746.35	1,741.25	667.96
Monaghan County Council	19.61	6.81	16,933	28.10	4,758.17	932.90	306.41
Offaly County Council	19.61	6.81	17,510	36.60	6,408.66	1,256.50	447.66
Roscommon County Council	16.68	6.44	18,535	18.40	3,410.44	568.89	184.83
Sligo County Council	18.75	10.42	17,890	33.20	5,939.48	1,113.41	404.57
South Dublin County Council	25.20	4.90	70,400	96.70	68,076.80	17,155.35	3,293.10
Tipperary County Council (NR)	14.47	5.52	18,403	33.30	6,128.20	886.51	245.87
Tipperary County Council (SR)	33.15	9.23	27,291	40.40	11,025.56	3,655.09	727.69
Waterford Corporation	29.20	8.28	18,280	100.00	18,280.00	5,337.18	1,513.53
Waterford County Council	19.62	7.30	12,401	27.50	3,410.28	669.10	248.95
Westmeath County Council	9.82	2.42	23,020	42.40	9,760.48	958.17	236.32
Wexford County Council	19.61	6.81	29,045	32.00	9,294.40	1,822.29	633.08
Wicklow County Council	13.88	4.45	45,066	58.40	26,318.54	3,652.34	1,171.64
Totals	19.65	5.78	1,220,856		732,340.67	158,356.41	36,701.06
Weighted % Paper in the Urban Waste Stream							**21.62**
Weighted % Paper Packaging in the Urban Waste Stream							**5.01**

Urban - Textile

Local Authority	% Textiles Material	% Textiles Material Packaging	Total Waste Arisings	% Population Urban	Total Waste Arisings - Urban	Weight Material Content	Weighted Packaging Content
Carlow County Council	9.71	2.57	12,200	46.10	5,624.20	546.04	144.31
Cavan County Council	0.94	0.00	17,472	16.90	2,952.77	27.82	0.08
Clare County Council	1.72	0.00	31,813	35.30	11,229.99	192.67	0.00
Cork Corporation	2.85	0.00	63,764	100.00	63,764.00	1,815.23	0.00
Cork County Council	3.17	0.00	119,343	43.20	51,556.18	1,632.96	0.00
Donegal County Council	2.13	0.00	26,000	21.80	5,668.00	120.68	0.00
Dublin Corporation	2.57	0.00	166,333	100.00	166,333.00	4,282.06	0.00
Dun Laoghaire - Rathdown C.C.	3.40	0.00	53,867	98.40	53,005.13	1,802.17	0.00
Fingal County Council	2.57	0.00	55,993	90.50	50,673.67	1,304.54	0.00
Galway Corporation	2.57	0.00	18,500	100.00	18,500.00	476.26	0.00
Galway County Council	2.13	0.00	27,647	12.40	3,428.23	72.99	0.00
Kerry County Council	1.48	0.02	26,845	31.20	8,375.64	124.30	1.37
Kildare County Council	3.25	0.51	42,471	60.60	25,737.43	837.53	130.78
Kilkenny C.C. & Kilkenny Corp	2.91	0.00	24,559	29.20	7,171.23	208.54	0.00
Laois County Council	3.17	0.00	23,352	29.10	6,795.43	215.23	0.00
Leitrim County Council	2.13	0.00	9,667	6.10	589.69	12.56	0.00
Limerick Corporation	2.57	0.00	26,000	100.00	26,000.00	669.34	0.00
Limerick County Council	0.94	0.00	29,500	25.50	7,522.50	70.87	0.21
Longford County Council	2.77	0.03	15,079	23.20	3,498.33	97.04	1.20
Louth County Council	0.00	0.00	28,671	63.50	18,206.09	0.00	0.00
Mayo County Council	0.94	0.00	52,356	21.30	11,151.83	105.06	0.31
Meath County Council	5.26	0.19	34,650	33.90	11,746.35	618.43	22.49
Monaghan County Council	3.17	0.00	16,933	28.10	4,758.17	150.71	0.00
Offaly County Council	3.17	0.00	17,510	36.60	6,408.66	202.98	0.00
Roscommon County Council	0.94	0.00	18,535	18.40	3,410.44	32.13	0.09
Sligo County Council	3.08	0.13	17,890	33.20	5,939.48	183.10	7.79
South Dublin County Council	1.80	0.00	70,400	96.70	68,076.80	1,225.38	0.00
Tipperary County Council (NR)	3.18	0.03	18,403	33.30	6,128.20	194.99	1.65
Tipperary County Council (SR)	2.94	0.00	27,291	40.40	11,025.56	324.06	0.00
Waterford Corporation	4.03	0.01	18,280	100.00	18,280.00	736.54	1.23
Waterford County Council	1.48	0.02	12,401	27.50	3,410.28	50.61	0.56
Westmeath County Council	4.25	0.23	23,020	42.40	9,760.48	414.84	22.46
Wexford County Council	3.17	0.00	29,045	32.00	9,294.40	294.39	0.00
Wicklow County Council	2.39	0.00	45,066	58.40	26,318.54	629.21	0.00
Totals	2.73	0.11	1,220,856		732,340.67	19,671.26	334.52
Weighted % Textile in the Urban Waste Stream							**2.69**
Weighted % Textile Packaging in the Urban Waste Stream							**0.05**

Urban - Glass

Local Authority	% Glass Material	% Glass Material Packaging	Total Waste Arisings	% Population Urban	Total Waste Arisings - Urban	Weight Material Content	Weighted Packaging Content
Carlow County Council	7.42	7.42	12,200	46.10	5,624.20	417.33	417.33
Cavan County Council	6.71	6.70	17,472	16.90	2,952.77	198.23	197.82
Clare County Council	8.82	7.35	31,813	35.30	11,229.99	990.88	825.73
Cork Corporation	4.43	4.26	63,764	100.00	63,764.00	2,827.71	2,718.12
Cork County Council	2.97	2.97	119,343	43.20	51,556.18	1,533.78	1,533.78
Donegal County Council	7.41	7.10	26,000	21.80	5,668.00	419.96	402.58
Dublin Corporation	5.95	5.65	166,333	100.00	166,333.00	9,898.79	9,398.29
Dun Laoghaire - Rathdown C.C.	5.70	5.60	53,867	98.40	53,005.13	3,021.29	2,968.29
Fingal County Council	5.95	5.65	55,993	90.50	50,673.67	3,015.68	2,863.21
Galway Corporation	5.95	5.65	18,500	100.00	18,500.00	1,100.97	1,045.30
Galway County Council	7.41	7.10	27,647	12.40	3,428.23	254.01	243.50
Kerry County Council	5.19	5.02	26,845	31.20	8,375.64	434.68	420.83
Kildare County Council	1.72	1.63	42,471	60.60	25,737.43	443.19	419.98
Kilkenny C.C. & Kilkenny Corp	4.04	4.04	24,559	29.20	7,171.23	289.43	289.43
Laois County Council	2.97	2.97	23,352	29.10	6,795.43	202.16	202.16
Leitrim County Council	7.41	7.10	9,667	6.10	589.69	43.69	41.88
Limerick Corporation	5.95	5.65	26,000	100.00	26,000.00	1,547.31	1,469.07
Limerick County Council	6.71	6.70	29,500	25.50	7,522.50	505.01	503.97
Longford County Council	5.07	5.07	15,079	23.20	3,498.33	177.31	177.31
Louth County Council	4.21	4.21	28,671	63.50	18,206.09	767.36	767.36
Mayo County Council	6.71	6.70	52,356	21.30	11,151.83	748.65	747.11
Meath County Council	4.88	3.54	34,650	33.90	11,746.35	573.45	416.04
Monaghan County Council	2.97	2.97	16,933	28.10	4,758.17	141.55	141.55
Offaly County Council	2.97	2.97	17,510	36.60	6,408.66	190.66	190.66
Roscommon County Council	6.71	6.70	18,535	18.40	3,410.44	228.95	228.48
Sligo County Council	4.92	4.92	17,890	33.20	5,939.48	292.18	292.18
South Dublin County Council	5.40	5.40	70,400	96.70	68,076.80	3,676.15	3,676.15
Tipperary County Council (NR)	4.30	4.30	18,403	33.30	6,128.20	263.69	263.69
Tipperary County Council (SR)	3.55	3.55	27,291	40.40	11,025.56	391.89	391.89
Waterford Corporation	2.41	2.41	18,280	100.00	18,280.00	439.97	439.97
Waterford County Council	5.19	5.02	12,401	27.50	3,410.28	176.99	171.35
Westmeath County Council	2.10	2.10	23,020	42.40	9,760.48	205.17	205.17
Wexford County Council	2.97	2.97	29,045	32.00	9,294.40	276.50	276.50
Wicklow County Council	8.24	7.36	45,066	58.40	26,318.54	2,169.71	1,938.27
Totals	5.16	4.96	1,220,856		732,340.67	37,864.27	36,284.93
Weighted % Glass in the Urban Waste Stream							**5.17**
Weighted % Glass Packaging in the Urban Waste Stream							**4.95**

Urban - Plastics

Local Authority	% Plastic Material	% Plastic Material Packaging	Total Waste Arisings	% Population Urban	Total Waste Arisings - Urban	Weight Material Content	Weighted Packaging Content
Carlow County Council	12.14	11.65	12,200	46.10	5,624.20	682.55	655.25
Cavan County Council	12.46	12.06	17,472	16.90	2,952.77	367.82	356.07
Clare County Council	10.05	9.68	31,813	35.30	11,229.99	1,128.50	1,087.22
Cork Corporation	15.01	15.01	63,764	100.00	63,764.00	9,569.93	9,569.93
Cork County Council	16.04	15.42	119,343	43.20	51,556.18	8,271.18	7,950.63
Donegal County Council	6.56	5.64	26,000	21.80	5,668.00	371.69	319.56
Dublin Corporation	12.24	10.33	166,333	100.00	166,333.00	20,353.69	17,183.85
Dun Laoghaire - Rathdown C.C.	12.90	12.30	53,867	98.40	53,005.13	6,837.66	6,519.63
Fingal County Council	12.24	10.33	55,993	90.50	50,673.67	6,200.79	5,235.09
Galway Corporation	12.24	10.33	18,500	100.00	18,500.00	2,263.79	1,911.23
Galway County Council	6.56	5.64	27,647	12.40	3,428.23	224.81	193.28
Kerry County Council	11.09	11.80	26,845	31.20	8,375.64	928.79	988.00
Kildare County Council	9.07	8.73	42,471	60.60	25,737.43	2,335.53	2,247.87
Kilkenny C.C. & Kilkenny Corp	14.91	14.14	24,559	29.20	7,171.23	1,069.09	1,014.30
Laois County Council	16.04	15.42	23,352	29.10	6,795.43	1,090.19	1,047.94
Leitrim County Council	6.56	5.64	9,667	6.10	589.69	38.67	33.25
Limerick Corporation	12.24	10.33	26,000	100.00	26,000.00	3,181.54	2,686.06
Limerick County Council	12.46	12.06	29,500	25.50	7,522.50	937.07	907.14
Longford County Council	10.24	8.63	15,079	23.20	3,498.33	358.22	301.91
Louth County Council	12.64	11.56	28,671	63.50	18,206.09	2,302.07	2,105.14
Mayo County Council	12.46	12.06	52,356	21.30	11,151.83	1,389.16	1,344.80
Meath County Council	12.62	10.37	34,650	33.90	11,746.35	1,481.99	1,218.55
Monaghan County Council	16.04	15.42	16,933	28.10	4,758.17	763.36	733.77
Offaly County Council	16.04	15.42	17,510	36.60	6,408.66	1,028.14	988.30
Roscommon County Council	12.46	12.06	18,535	18.40	3,410.44	424.83	411.27
Sligo County Council	14.17	14.17	17,890	33.20	5,939.48	841.48	841.48
South Dublin County Council	8.10	6.90	70,400	96.70	68,076.80	5,514.22	4,697.30
Tipperary County Council (NR)	9.55	8.62	18,403	33.30	6,128.20	585.38	528.20
Tipperary County Council (SR)	11.55	11.55	27,291	40.40	11,025.56	1,273.63	1,273.63
Waterford Corporation	14.57	11.81	18,280	100.00	18,280.00	2,664.30	2,159.38
Waterford County Council	11.09	11.80	12,401	27.50	3,410.28	378.17	402.28
Westmeath County Council	5.71	4.40	23,020	42.40	9,760.48	557.11	429.81
Wexford County Council	16.04	15.42	29,045	32.00	9,294.40	1,491.11	1,433.32
Wicklow County Council	9.04	7.28	45,066	58.40	26,318.54	2,379.45	1,916.57
Totals	11.86	11.00	1,220,856		732,340.67	89,285.93	80,692.02
Weighted % Plastic in the Urban Waste Stream							**12.19**
Weighted % Plastic Packaging in the Urban Waste Stream							**11.02**

Urban - Ferrous Metals

Local Authority	% Ferrous Material	% Ferrous Material Packaging	Total Waste Arisings	% Population Urban	Total Waste Arisings - Urban	Weight Material Content	Weighted Packaging Content
Carlow County Council	4.16	4.16	12,200	46.10	5,624.20	234.02	234.02
Cavan County Council	2.22	2.22	17,472	16.90	2,952.77	65.67	65.67
Clare County Council	0.74	0.74	31,813	35.30	11,229.99	82.57	82.57
Cork Corporation	1.58	1.53	63,764	100.00	63,764.00	1,008.25	974.43
Cork County Council	0.25	0.25	119,343	43.20	51,556.18	130.81	130.81
Donegal County Council	2.98	2.38	26,000	21.80	5,668.00	168.95	135.16
Dublin Corporation	1.77	1.77	166,333	100.00	166,333.00	2,947.39	2,947.39
Dun Laoghaire - Rathdown C.C.	1.80	1.80	53,867	98.40	53,005.13	954.09	954.09
Fingal County Council	1.77	1.77	55,993	90.50	50,673.67	897.93	897.93
Galway Corporation	1.77	1.77	18,500	100.00	18,500.00	327.82	327.82
Galway County Council	2.98	2.38	27,647	12.40	3,428.23	102.19	81.75
Kerry County Council	1.94	1.92	26,845	31.20	8,375.64	162.12	161.05
Kildare County Council	1.78	1.53	42,471	60.60	25,737.43	459.37	394.20
Kilkenny C.C. & Kilkenny Corp	0.98	0.02	24,559	29.20	7,171.23	70.56	1.72
Laois County Council	0.25	0.25	23,352	29.10	6,795.43	17.24	17.24
Leitrim County Council	2.98	2.38	9,667	6.10	589.69	17.58	14.06
Limerick Corporation	1.77	1.77	26,000	100.00	26,000.00	460.72	460.72
Limerick County Council	2.22	2.22	29,500	25.50	7,522.50	167.30	167.30
Longford County Council	2.26	2.26	15,079	23.20	3,498.33	79.07	79.07
Louth County Council	5.63	5.63	28,671	63.50	18,206.09	1,025.41	1,025.41
Mayo County Council	2.22	2.22	52,356	21.30	11,151.83	248.01	248.01
Meath County Council	3.42	3.42	34,650	33.90	11,746.35	401.58	401.58
Monaghan County Council	0.25	0.25	16,933	28.10	4,758.17	12.07	12.07
Offaly County Council	0.25	0.25	17,510	36.60	6,408.66	16.26	16.26
Roscommon County Council	2.22	2.22	18,535	18.40	3,410.44	75.85	75.85
Sligo County Council	2.04	2.04	17,890	33.20	5,939.48	121.16	121.16
South Dublin County Council	1.90	1.90	70,400	96.70	68,076.80	1,293.46	1,293.46
Tipperary County Council (NR)	1.74	1.66	18,403	33.30	6,128.20	106.55	101.61
Tipperary County Council (SR)	1.37	1.37	27,291	40.40	11,025.56	150.73	150.73
Waterford Corporation	2.35	2.35	18,280	100.00	18,280.00	428.94	428.94
Waterford County Council	1.94	1.92	12,401	27.50	3,410.28	66.01	65.57
Westmeath County Council	1.17	1.17	23,020	42.40	9,760.48	113.82	113.82
Wexford County Council	0.25	0.25	29,045	32.00	9,294.40	23.58	23.58
Wicklow County Council	2.20	2.20	45,066	58.40	26,318.54	578.59	578.59
Totals	1.92	1.82	1,220,856		732,340.67	13,015.63	12,783.61
Weighted % Ferrous Metal in the Urban Waste Stream							**1.78**
Weighted % Ferrous Metal Packaging in the Urban Waste Stream							**1.75**

Urban - Non Ferrous Metals

Local Authority	% Non Ferrous Metal	% Non Ferrous Metal Packaging	Total Waste Arisings	% Population Urban	Total Waste Arisings - Urban	Weight Material Content	Weighted Packaging Content
Carlow County Council	3.05	2.50	12,200	46.10	5,624.20	171.61	140.41
Cavan County Council	0.45	0.26	17,472	16.90	2,952.77	13.22	7.67
Clare County Council	1.59	1.23	31,813	35.30	11,229.99	178.91	137.62
Cork Corporation	1.07	0.93	63,764	100.00	63,764.00	684.75	594.92
Cork County Council	1.60	1.19	119,343	43.20	51,556.18	825.11	612.36
Donegal County Council	0.61	0.31	26,000	21.80	5,668.00	34.76	17.38
Dublin Corporation	1.14	1.14	166,333	100.00	166,333.00	1,890.78	1,890.78
Dun Laoghaire - Rathdown C.C.	1.00	0.70	53,867	98.40	53,005.13	530.05	371.04
Fingal County Council	1.14	1.14	55,993	90.50	50,673.67	576.03	576.03
Galway Corporation	1.14	1.14	18,500	100.00	18,500.00	210.30	210.30
Galway County Council	0.61	0.31	27,647	12.40	3,428.23	21.02	10.51
Kerry County Council	0.90	0.36	26,845	31.20	8,375.64	75.60	29.87
Kildare County Council	1.03	0.95	42,471	60.60	25,737.43	265.57	243.80
Kilkenny C.C. & Kilkenny Corp	3.09	2.89	24,559	29.20	7,171.23	221.45	207.11
Laois County Council	1.60	1.19	23,352	29.10	6,795.43	108.75	80.71
Leitrim County Council	0.61	0.31	9,667	6.10	589.69	3.62	1.81
Limerick Corporation	1.14	1.14	26,000	100.00	26,000.00	295.55	295.55
Limerick County Council	0.45	0.26	29,500	25.50	7,522.50	33.67	19.54
Longford County Council	0.31	0.10	15,079	23.20	3,498.33	10.78	3.59
Louth County Council	0.26	0.26	28,671	63.50	18,206.09	47.54	47.54
Mayo County Council	0.45	0.26	52,356	21.30	11,151.83	49.91	28.96
Meath County Council	1.15	0.71	34,650	33.90	11,746.35	134.93	83.53
Monaghan County Council	1.60	1.19	16,933	28.10	4,758.17	76.15	56.52
Offaly County Council	1.60	1.19	17,510	36.60	6,408.66	102.56	76.12
Roscommon County Council	0.45	0.26	18,535	18.40	3,410.44	15.26	8.86
Sligo County Council	1.19	1.19	17,890	33.20	5,939.48	70.51	70.51
South Dublin County Council	0.70	0.40	70,400	96.70	68,076.80	476.54	272.31
Tipperary County Council (NR)	1.09	0.49	18,403	33.30	6,128.20	67.05	30.03
Tipperary County Council (SR)	1.71	0.48	27,291	40.40	11,025.56	188.41	52.75
Waterford Corporation	1.72	1.41	18,280	100.00	18,280.00	313.74	257.36
Waterford County Council	0.90	0.36	12,401	27.50	3,410.28	30.78	12.16
Westmeath County Council	0.55	0.34	23,020	42.40	9,760.48	53.91	32.95
Wexford County Council	1.60	1.19	29,045	32.00	9,294.40	148.75	110.39
Wicklow County Council	0.33	0.16	45,066	58.40	26,318.54	86.79	43.39
Totals	1.11	0.82	1,220,856		732,340.67	8,014.34	6,634.37
Weighted % Non Ferrous Metal in the Urban Waste Stream							**1.09**
Weighted % Non Ferrous Metal Packaging in the Urban Waste Stream							**0.91**

Urban - Other Metals

Local Authority	% Other Metal	% Other Metal Packaging	Total Waste Arisings	% Population Urban	Total Waste Arisings - Urban	Weight Material Content	Weighted Packaging Content
Carlow County Council	3.26	0.28	12,200	46.10	5,624.20	183.31	15.60
Cavan County Council	0.34	0.14	17,472	16.90	2,952.77	10.03	4.24
Clare County Council	0.00	0.00	31,813	35.30	11,229.99	0.00	0.00
Cork Corporation	0.27	0.27	63,764	100.00	63,764.00	172.57	172.57
Cork County Council	0.00	0.00	119,343	43.20	51,556.18	0.00	0.00
Donegal County Council	0.70	0.27	26,000	21.80	5,668.00	39.58	15.45
Dublin Corporation	0.70	0.00	166,333	100.00	166,333.00	1,167.83	0.00
Dun Laoghaire - Rathdown C.C.	0.20	0.00	53,867	98.40	53,005.13	106.01	0.00
Fingal County Council	0.70	0.00	55,993	90.50	50,673.67	355.78	0.00
Galway Corporation	0.70	0.00	18,500	100.00	18,500.00	129.89	0.00
Galway County Council	0.70	0.27	27,647	12.40	3,428.23	23.94	9.34
Kerry County Council	0.24	0.00	26,845	31.20	8,375.64	20.51	0.00
Kildare County Council	0.49	0.00	42,471	60.60	25,737.43	126.91	0.00
Kilkenny C.C. & Kilkenny Corp	0.05	0.05	24,559	29.20	7,171.23	3.44	3.44
Laois County Council	0.00	0.00	23,352	29.10	6,795.43	0.00	0.00
Leitrim County Council	0.70	0.27	9,667	6.10	589.69	4.12	1.61
Limerick Corporation	0.70	0.00	26,000	100.00	26,000.00	182.55	0.00
Limerick County Council	0.34	0.14	29,500	25.50	7,522.50	25.56	10.81
Longford County Council	1.30	0.00	15,079	23.20	3,498.33	45.53	0.00
Louth County Council	0.00	0.00	28,671	63.50	18,206.09	0.00	0.00
Mayo County Council	0.34	0.14	52,356	21.30	11,151.83	37.89	16.02
Meath County Council	1.27	0.00	34,650	33.90	11,746.35	149.39	0.00
Monaghan County Council	0.00	0.00	16,933	28.10	4,758.17	0.00	0.00
Offaly County Council	0.00	0.00	17,510	36.60	6,408.66	0.00	0.00
Roscommon County Council	0.34	0.14	18,535	18.40	3,410.44	11.59	4.90
Sligo County Council	0.00	0.00	17,890	33.20	5,939.48	0.00	0.00
South Dublin County Council	0.70	0.00	70,400	96.70	68,076.80	476.54	0.00
Tipperary County Council (NR)	0.00	0.00	18,403	33.30	6,128.20	0.00	0.00
Tipperary County Council (SR)	0.00	0.00	27,291	40.40	11,025.56	0.00	0.00
Waterford Corporation	0.42	0.00	18,280	100.00	18,280.00	77.21	0.00
Waterford County Council	0.24	0.00	12,401	27.50	3,410.28	8.35	0.00
Westmeath County Council	0.00	0.00	23,020	42.40	9,760.48	0.00	0.00
Wexford County Council	0.00	0.00	29,045	32.00	9,294.40	0.00	0.00
Wicklow County Council	0.44	0.00	45,066	58.40	26,318.54	115.72	0.00
Totals	0.45	0.06	1,220,856		732,340.67	3,474.26	253.97
Weighted % Other Metal in the Urban Waste Stream							**0.47**
Weighted % Other Metal Packaging in the Urban Waste Stream							**0.03**

Urban - Other Materials

Local Authority	% Other Materials	% Other Packaging	Total Waste Arisings	% Population Urban	Total Waste Arisings - Urban	Other Material Content	%Weighted Other Packaging
Carlow County Council	34.33	5.41	12,200	46.10	5,624.20	1,930.64	304.22
Cavan County Council	23.05	3.34	17,472	16.90	2,952.77	680.50	98.54
Clare County Council	25.12	1.35	31,813	35.30	11,229.99	2,821.26	151.38
Cork Corporation	14.93	0.82	63,764	100.00	63,764.00	9,520.98	522.15
Cork County Council	32.65	5.82	119,343	43.20	51,556.18	16,835.61	3,001.43
Donegal County Council	44.37	1.12	26,000	21.80	5,668.00	2,514.93	63.72
Dublin Corporation	17.65	2.98	166,333	100.00	166,333.00	29,362.70	4,949.39
Dun Laoghaire - Rathdown C.C.	17.80	2.60	53,867	98.40	53,005.13	9,434.91	1,378.13
Fingal County Council	17.65	2.98	55,993	90.50	50,673.67	8,945.40	1,507.84
Galway Corporation	17.65	2.98	18,500	100.00	18,500.00	3,265.80	550.48
Galway County Council	44.37	1.12	27,647	12.40	3,428.23	1,521.13	38.54
Kerry County Council	35.10	2.34	26,845	31.20	8,375.64	2,939.74	195.82
Kildare County Council	43.60	1.46	42,471	60.60	25,737.43	11,220.30	377.01
Kilkenny C.C. & Kilkenny Corp	25.16	2.82	24,559	29.20	7,171.23	1,804.28	202.23
Laois County Council	32.65	5.82	23,352	29.10	6,795.43	2,219.04	395.61
Leitrim County Council	44.37	1.12	9,667	6.10	589.69	261.65	6.63
Limerick Corporation	17.65	2.98	26,000	100.00	26,000.00	4,589.77	773.65
Limerick County Council	23.05	3.34	29,500	25.50	7,522.50	1,733.64	251.05
Longford County Council	21.40	2.47	15,079	23.20	3,498.33	748.79	86.26
Louth County Council	52.48	5.22	28,671	63.50	18,206.09	9,554.63	950.71
Mayo County Council	23.05	3.34	52,356	21.30	11,151.83	2,570.06	372.17
Meath County Council	33.26	1.71	34,650	33.90	11,746.35	3,906.56	200.79
Monaghan County Council	32.65	5.82	16,933	28.10	4,758.17	1,553.78	277.01
Offaly County Council	32.65	5.82	17,510	36.60	6,408.66	2,092.74	373.09
Roscommon County Council	23.05	3.34	18,535	18.40	3,410.44	785.97	113.82
Sligo County Council	28.49	2.30	17,890	33.20	5,939.48	1,691.93	136.35
South Dublin County Council	8.50	1.60	70,400	96.70	68,076.80	5,786.53	1,089.23
Tipperary County Council (NR)	12.35	2.42	18,403	33.30	6,128.20	756.92	148.51
Tipperary County Council (SR)	11.96	1.44	27,291	40.40	11,025.56	1,318.85	158.26
Waterford Corporation	28.24	1.68	18,280	100.00	18,280.00	5,163.16	306.38
Waterford County Council	35.10	2.34	12,401	27.50	3,410.28	1,196.96	79.73
Westmeath County Council	58.33	1.20	23,020	42.40	9,760.48	5,693.29	117.11
Wexford County Council	32.65	5.82	29,045	32.00	9,294.40	3,035.08	541.09
Wicklow County Council	29.46	2.12	45,066	58.40	26,318.54	7,753.09	556.89
Totals	28.67	2.91	1,220,856		732,340.67	165,210.60	20,275.23
Weighted % Other Materials in the Urban Waste Stream							**22.56**
Weighted % Other Packaging in the Urban Waste Stream							**2.77**

E1.3: COMMERCIAL WASTE CHARACTERISATION

This appendix presents the raw data from the four commercial waste composition surveys carried out in Ireland to date. This include the general commercial and supermarket surveys carried out by Kerry County Council, the office waste survey carried out by the MCCK Group as part of the preparatory work for the formulation of the Dublin Waste Management Strategy and the survey carried out for the 1995 NWD report at Finglas.

Kerry General Commercial Survey

EWC	WASTE CATEGORIES	WEIGHT (kg)	% of CATEGORY	% of TOTAL
	ORGANIC WASTE			
20 01 08	Food waste	86.832	100.0	
20 02 01	Garden waste	0	0.0	
Sub-Total – organic waste		86.832	100.0	13.5
	PAPERS			
20 01 01 01	Packaging	127.02	69.3	
20 01 01 02	Newspapers-Brochures	38.9	21.2	
20 01 01 03	Magazines & glossy paper	17.44	9.5	
20 01 01 04	Other papers	0	0.0	
Sub-Total – papers		183.36	100.0	28.6
	CARDBOARDS			
20 01 01 05	Flat packaging cardboard	16.74	17.2	
20 01 01 06	Corrugated packaging board	80.67	82.8	
20 01 01 07	Other cardboards	0	0.0	
Sub-Total – cardboards		97.41	100.0	15.2
	COMPOSITES			
20 01 01 08	Cardboard composite packaging	1	6.6	
20 01 01 09	Liquid packaging Al	1.14	7.5	
20 01 01 10	Liquid packaging Non-Al	3.533	23.2	
20 01 01 11	Disposable nappies	9.58	62.8	
20 01 01 12	Other composite packaging	0	0.0	
Sub-Total – composites		15.253	100.0	2.4
	TEXTILES			
20 01 11 01	Packaging	1.5	20.7	
20 01 11 02	Other textiles	5.76	79.3	
Sub-Total – textiles		7.26	100.0	1.1
	HEALTH CARE TEXTILES			
20 01 11 03	Health care textiles	0	0	
Sub-Total – health care textiles		0	0	0.0
	PLASTIC			
20 01 03 01	Mixed flexible plastic	45.4	64.9	
20 01 03 02	Clear PVC bottles	0.5	0.7	
20 01 03 03	Clear PET bottles	2.78	4.0	
20 01 03 04	Mixed rigid plastic	6.72	9.6	
20 01 03 05	Opaque PVC jars & bottles	0	0.0	
20 01 03 06	Green PET jars & bottles	1.33	1.9	
20 01 03 07	Brown PET jars & bottles	0.5	0.7	
20 01 03 08	PE Bottles	2.94	4.2	

EWC	WASTE CATEGORIES	WEIGHT (kg)	% of CATEGORY	% of TOTAL
20 01 03 09	Supermarket bags	6.907	9.9	
20 01 03 10	Other plastic packaging	0	0.0	
20 01 04	Other plastic waste (Styrofoam)	2.86	4.1	
Sub-Total - plastic		69.937	100.0	10.9
	GLASS			
20 01 02 01	Green glass packaging	8.12	17.9	
20 01 02 02	Clear glass packaging	25.3	55.8	
20 01 02 03	Brown glass packaging	11.93	26.3	
20 01 02 04	Packaging glass other colour	0	0.0	
20 01 02 05	Other glass waste	0	0.0	
Sub-Total - glass		45.35	100.0	7.1
	METALS			
20 01 05 01	Ferrous metal packaging	7.67	38.9	
20 01 05 02	Other ferrous metal waste	4.7	23.8	
20 01 05 03	Aluminium packaging	3.49	17.7	
20 01 05 04	Other aluminium waste	2.37	12.0	
20 01 05 05	Other metal packaging	0	0.0	
20 01 06	Other metal waste	1.5	7.6	
Sub-Total - metals		19.73	100.0	3.1
	SPECIAL MUNICIPAL WASTE			
20 01 12	Paints, ink, pastes and resins	0	0.0	
20 01 13	Solvents	0	0.0	
20 01 16	Detergents	0	0.0	
20 01 17	Photochemicals	0	0.0	
20 01 19	Pesticides	0	0.0	
20 01 20	Batteries and accumulators	0.1	9.1	
20 01 21	Fluorescent tubes and other mercury containing wastes	0	0.0	
20 01 22	Aerosols	0	0.0	
20 01 24	Electronic equipment	1	90.9	
20 01 27	Other special domestic waste	0	0.0	
Sub-Total - special municipal waste		1.1	100.0	0.2
	UNCLASSIFIED COMBUSTIBLES			
20 01 25 01	Wood Packaging	1.2	14.9	
20 01 25 02	Other combustible packaging	0	0.0	
20 01 25 03	Other unclassified combustibles	6.84	85.1	
Sub-Total - unclassified combustibles		8.04	100.0	1.3
	UNCLASSIFIED INCOMBUSTIBLES			
20 01 26 01	Unclassified incombustible packaging	0	0.0	
20 01 26 02	Other unclassified incombustibles	3.98	100.0	
Sub-Total - unclassified incombustibles		3.98	100.0	0.6
	COMPONENTS SMALLER THAN 20 mm ROUND MESH			
20 01 28	Fine elements smaller than 20 mm round mesh	103.88	100.0	
20 01 29	Fine elements ranging from 8 to 20 mm	0	0.0	
Sub-Total - components less than 20 mm		**103.88**	**100.0**	**16.2**
TOTAL		**642.132**		**100.0**

Kerry Supermarket Survey

EWC	WASTE CATEGORIES	WEIGHT (kg)	% of CATEGORY	% of TOTAL
	ORGANIC WASTE			
20 01 08	Food waste	84.5	100.0	
20 02 01	Garden waste		0.0	
Sub-Total - organic waste		84.5	100.0	12.0
	PAPERS			
20 01 01 01	Packaging	15.31	88.4	
20 01 01 02	Newspapers-Brochures		0.0	
20 01 01 03	Magazines & glossy paper	2	11.6	
20 01 01 04	Other papers		0.0	
Sub-Total - papers		17.31	100.0	2.5
	CARDBOARDS			
20 01 01 05	Flat packaging cardboard	7.5	1.6	
20 01 01 06	Corrugated packaging board	470	98.4	
20 01 01 07	Other cardboards		0.0	
Sub-Total - cardboards		477.5	100.0	67.9
	COMPOSITES			
20 01 01 08	Cardboard composite packaging	1	50.0	
20 01 01 09	Liquid packaging Al	1	50.0	
20 01 01 10	Liquid packaging Non-Al		0.0	
20 01 01 11	Disposable nappies		0.0	
20 01 01 12	Other composite packaging		0.0	
Sub-Total - composites		2	100.0	0.3
	TEXTILES			
20 01 11 01	Packaging	2.5	100.0	
20 01 11 02	Other textiles		0.0	
Sub-Total - textiles		2.5	100.0	0.4
	HEALTH CARE TEXTILES			
20 01 11 03	Health care textiles		0	
Sub-Total - health care textiles		0	0	0.0
	PLASTIC			
20 01 03 01	Mixed flexible plastic	53.45	89.4	
20 01 03 02	Clear PVC bottles		0.0	
20 01 03 03	Clear PET bottles	0.5	0.8	
20 01 03 04	Mixed rigid plastic	0.5	0.8	
20 01 03 05	Opaque PVC jars & bottles		0.0	
20 01 03 06	Green PET jars & bottles		0.0	
20 01 03 07	Brown PET jars & bottles		0.0	
20 01 03 08	PE Bottles		0.0	
20 01 03 09	Supermarket bags	2.36	3.9	
20 01 03 10	Other plastic packaging		0.0	
20 01 04	Other plastic waste (Styrofoam)	3	5.0	

EWC	WASTE CATEGORIES	WEIGHT (kg)	% of CATEGORY	% of TOTAL
Sub-Total - plastic		59.81	100.0	8.5
	GLASS			
20 01 02 01	Green glass packaging	4.4	100.0	
20 01 02 02	Clear glass packaging		0.0	
20 01 02 03	Brown glass packaging		0.0	
20 01 02 04	Packaging glass other colour		0.0	
20 01 02 05	Other glass waste		0.0	
Sub-Total - glass		4.4	100.0	0.6
	METALS			
20 01 05 01	Ferrous metal packaging	1.5	29.8	
20 01 05 02	Other ferrous metal waste		0.0	
20 01 05 03	Aluminium packaging	3.54	70.2	
20 01 05 04	Other aluminium waste		0.0	
20 01 05 05	Other metal packaging		0.0	
20 01 06	Other metal waste		0.0	
Sub-Total - metals		5.04	100.0	0.7
	SPECIAL MUNICIPAL WASTE			
20 01 12	Paints, ink, pastes and resins		0	
20 01 13	Solvents		0	
20 01 16	Detergents		0	
20 01 17	Photochemicals		0	
20 01 19	Pesticides		0	
20 01 20	Batteries and accumulators		0	
20 01 21	Fluorescent tubes and other mercury containing wastes		0	
20 01 22	Aerosols		0	
20 01 24	Electronic equipment		0	
20 01 27	Other special domestic waste		0	
Sub-Total - special municipal waste		0	0	0.0
	UNCLASSIFIED COMBUSTIBLES			
20 01 25 01	Wood Packaging	28.2	100.0	
20 01 25 02	Other combustible packaging		0.0	
20 01 25 03	Other unclassified combustibles		0.0	
Sub-Total - unclassified combustibles		28.2	100.0	4.0
	UNCLASSIFIED INCOMBUSTIBLES			
20 01 26 01	Unclassified incombustible packaging		0	
20 01 26 02	Other unclassified incombustibles		0	
Sub-Total - unclassified incombustibles		0	0	0.0
	COMPONENTS SMALLER THAN 20 mm ROUND MESH			
20 01 28	Fine elements smaller than 20 mm round mesh	21.5	100.0	
20 01 29	Fine elements ranging from 8 to 20 mm		0.0	
Sub-Total - components less than 20 mm		21.5	100.0	3.1
TOTAL		**702.76**		**100**

MCCK Office Waste Survey

EWC	WASTE CATEGORIES	WEIGHT (kg)	% of CATEGORY	% of TOTAL
	ORGANIC WASTE			
20 01 08	Food waste	9.32	47.6	
20 02 01	Garden waste	10.24	52.4	
Sub-Total - organic waste		19.56	100.0	12.6
	PAPERS			
20 01 01 01	Packaging	3.18	4.0	
20 01 01 02	Newspapers-Brochures	17.92	22.5	
20 01 01 03	Magazines & glossy paper	7.94	10.0	
20 01 01 04	Other papers	50.72	63.6	
Sub-Total - papers		79.76	100.0	51.4
	CARDBOARDS			
20 01 01 05	Flat packaging cardboard	2.1	9.9	
20 01 01 06	Corrugated packaging board	15.84	74.7	
20 01 01 07	Other cardboards	3.26	15.4	
Sub-Total - cardboards		21.2	100.0	13.7
	COMPOSITES			
20 01 01 08	Cardboard composite packaging	0	0.0	
20 01 01 09	Liquid packaging Al	1.02	27.9	
20 01 01 10	Liquid packaging Non-Al	1.26	34.4	
20 01 01 11	Disposable nappies	1.38	37.7	
20 01 01 12	Other composite packaging	0	0.0	
Sub-Total - composites		3.66	100.0	2.4
	TEXTILES			
20 01 11 01	Packaging	0	0.0	
20 01 11 02	Other textiles	1.5	100.0	
Sub-Total - textiles		1.5	100.0	1.0
	HEALTH CARE TEXTILES			
20 01 11 03	Health care textiles	0.16	100	
Sub-Total - health care textiles		0.16	100	0.1
	PLASTIC			
20 01 03 01	Mixed flexible plastic	4.84	22.9	
20 01 03 02	Clear PVC bottles	0.18	0.9	
20 01 03 03	Clear PET bottles	0.48	2.3	
20 01 03 04	Mixed rigid plastic	1.78	8.4	
20 01 03 05	Opaque PVC jars & bottles	0	0.0	
20 01 03 06	Green PET jars & bottles	0.16	0.8	
20 01 03 07	Brown PET jars & bottles	0	0.0	
20 01 03 08	PE Bottles	0.7	3.3	
20 01 03 09	Supermarket bags	2.02	9.6	
20 01 03 10	Other plastic packaging	1.02	4.8	
20 01 04	Other plastic waste (Styrofoam)	9.91	47.0	
Sub-Total - plastic		21.09	100.0	13.6

EWC	WASTE CATEGORIES	WEIGHT (kg)	% of CATEGORY	% of TOTAL
	GLASS			
20 01 02 01	Green glass packaging	0.42	21.9	
20 01 02 02	Clear glass packaging	0.8	41.7	
20 01 02 03	Brown glass packaging	0.2	10.4	
20 01 02 04	Packaging glass other colour	0	0.0	
20 01 02 05	Other glass waste	0.5	26.0	
Sub-Total - glass		1.92	100.0	1.2
	METALS			
20 01 05 01	Ferrous metal packaging	1.94	65.5	
20 01 05 02	Other ferrous metal waste	0	0.0	
20 01 05 03	Aluminium packaging	0.96	32.4	
20 01 05 04	Other aluminium waste	0	0.0	
20 01 05 05	Other metal packaging	0.06	2.0	
20 01 06	Other metal waste	0	0.0	
Sub-Total - metals		2.96	100.0	1.9
	SPECIAL MUNICIPAL WASTE			
20 01 12	Paints, ink, pastes and resins	0	0.0	
20 01 13	Solvents	0	0.0	
20 01 16	Detergents	0	0.0	
20 01 17	Photochemicals	0	0.0	
20 01 19	Pesticides	0	0.0	
20 01 20	Batteries and accumulators	0	0.0	
20 01 21	Fluorescent tubes and other mercury containing wastes	0	0.0	
20 01 22	Aerosols	0	0.0	
20 01 24	Electronic equipment	0	0.0	
20 01 27	Other special domestic waste	0.2	100.0	
Sub-Total - special municipal waste		0.2	100.0	0.1
	UNCLASSIFIED COMBUSTIBLES			
20 01 25 01	Wood Packaging	0	0.0	
20 01 25 02	Other combustible packaging	0.8	100.0	
20 01 25 03	Other unclassified combustibles	0	0.0	
Sub-Total - unclassified combustibles		0.8	100.0	0.5
	UNCLASSIFIED INCOMBUSTIBLES			
20 01 26 01	Unclassified incombustible packaging	0	0	
20 01 26 02	Other unclassified incombustibles	0	0	
Sub-Total - unclassified incombustibles		0	0	0.0
	COMPONENTS SMALLER THAN 20 mm ROUND MESH			
20 01 28	Fine elements smaller than 20 mm round mesh	2.44	100.0	
20 01 29	Fine elements ranging from 8 to 20 mm	0	0.0	
Sub-Total - components less than 20 mm		2.44	100.0	1.6
TOTAL		155.25		100

Finglas Commercial Waste Survey

Waste Category	Commercial Outlet						
	Building Society	Newsagents	Butcher	Fruit & Veg Shop	Hardware	Chiropractic Clinic	Photo Lab.
	% of Total						
Organic waste	9.52	0.66	6.45	65.18	2.94	0.00	7.74
Papers	66.67	61.18	3.23	2.47	8.82	67.57	65.99
Cardboards	3.17	22.04	58.06	19.19	45.59	0.00	12.79
Composites	1.59	0.33	0.00	0.00	0.00	0.00	0.00
Textiles	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Health care textiles	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Plastic	12.70	8.06	8.06	3.09	9.56	10.81	12.79
Unclassified combustibles	0.00	0.00	0.00	10.07	0.00	0.00	0.00
Glass	3.17	0.00	0.00	0.00	19.12	16.22	0.00
Metals	3.17	6.41	0.00	0.00	3.68	5.41	0.34
Unclassified incombustible	0.00	1.32	0.00	0.00	0.00	0.00	0.00
Special municipal waste	0.00	0.00	0.00	0.00	10.29	0.00	0.34
Components smaller than 20mm round mesh	0.00	0.00	24.19	0.00	0.00	0.00	0.00
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00

	Commercial Outlet						
	Building Society	Newsagents	Butcher	Fruit & Veg Shop	Hardware	Chiropractic Clinic	Photo Lab.
Number of Employees	4.50	1.50	2.00	3.75	2.50	2.00	2.00
Average weight of waste (kg) produced per employee/week	1.75	30.40	9.30	42.10	8.16	0.46	22.28
Average weight of waste (tonnes) produced per employee/annum	0.09	1.58	2.19	0.42	0.02	0.02	1.12
Percentage packaging in total waste	20.64	23.52	66.12	32.30	58.09	32.43	25.58

APPENDIX F: SUMMARY OF CLEANER PRODUCTION - PILOT DEMONSTRATION PROGRAMME

Company	Project Title	Objectives	Environmental Benefit	Economic Benefit
A.T Cross	Waste Minimisation at A.T. Cross Plant, Ballinasloe	• Reduction in cooling water usage; • Chromic acid recovery; • Reduction in reject/unsuitable refills; • Reduction in chemical usage; and • Replacement for trichlorethylene degreasing	• 30 % reduction in sludge production; • 50% of trichloroethylene degreasing replaced with aqueous cleaning; • 55% reduction in pen refill manufacturing waste; • 40% reduction in mask wash usage; and • 100% Recycling of cooling water	£40,000
Avonmore Waterford Group	Integrated Constructed Wetlands Reduces Impact of Land Spreading of Effluent	• Integrated constructed wetlands to reduce the potential impact of landspreading of effluent on soil and groundwater; • Boiler combustion management system to reduce gas use by 7%; and • Waste management system to improve the management of waste water and to improve the environmental performance of the site	• 8.5% reduction in gas usage on site; and • 60% reduction in electricity usage in boiler house	£35,000
C Fab Manufacturing	Reduction of VOC Emissions, Effluent & Solid Waste	• Reduction in VOC emissions; • Reduction in paint sludge; • To achieve certification to ISO 14001; • Elimination of cyanide and its resultant wastes from the facility; • Reduction in the output of chrome sludge; and • Reduction in the requirement for in-house treatment	• 100% reduction in cyanide waste (37 tonnes/year); • 56% reduction in chrome sludge (26 tonnes/year); • 86% reduction in coating waste (146 tonnes/year); • 86% reduction in VOC emissions (37 tonnes/year); and • 76% reduction in rinse water (65 tonnes/year)	
Coates Lorilleux	Reduction of VOC Emissions & Packaging Waste	• Demonstrate the significant financial and environmental benefits of implementing a packaging and VOC waste minimisation programme; and • Establish a framework and methodology which companies can follow to initiate their own investigations and save money.	• Reduction of 74 tonnes of packaging waste; • 10% reduction in VOC emissions (37 tonnes/year); and • 80% reduction in hazardous waste (19 tonnes/year).	£68,000
Dairygold	Converting Dairy Sludge into Fertiliser	• Conversion of liquid sludges into a granulated fertiliser product and to have the fertiliser product independently tested in a series of growing trials. •	• Converting 75,000 tonnes of dairy sludge into niche fertiliser products	
Hitech Plating	Minimisation of Environmental Effects at a Surface Treatment & Metal Finishing Facility	• Reduction in water usage; • Reduction in solid waste; • Reduction in the use of hazardous chemicals; • Set-up an emergency reduction programme; • Initiate the setting up of an Environmental Management System to meet the requirements of ISO 14001.	• 86% reduction in rinse water; • 40% reduction in spray masking paper; • 60% reduction in hazardous chemicals; • 65% reduction in sludge from waste water treatment plant; and • 20% reduction in energy consumption on site	£56,000

Company	Project Title	Objectives	Environmental Benefit	Economic Benefit
Mallinckrodt Medical Imaging	Enhanced Cooling Tower Treatment System	• Elimination of the use of chemicals to treat the water in the cooling towers and to reduce the water consumption of the cooling system	• Eliminated the use of 1.3 tonnes/year of corrosion inhibitors and biocides; and • 7,500m^3/yr reduction in cooling water usage	£10,000
John Ronan & Sons	Waste Minimisation in the Tanning Industry	• Reduction of the quantity of fat containing waste disposed of off site; • Reduction of chromic oxide consumption; • Substitution of ammonium salts with CO2 so as to reduce the ammonium nitrogen content of waste streams; and • Compilation of baseline data on packaging waste generated on site	• Reduction of 14,00 tonnes of waste; and • 20% reduction in chrome usage (70 tonnes/year)	£139,000
SIFA	Turning a Waste Stream into a Commercial Product	• To study the precipitation and isolation of sodium acetate trihydrate solid from a particular waste stream so that it would contribute only a minimum to the overall site COD load; and • Production of sodium acetate trihydrate of a sufficiently pure quality to allow it to be sold on a commercial basis to the dyestuff and other industries	• Converted 700 tonne/yearr waste stream into product	£335,000
Sifco Turbine Components	More Efficient Use of Materials and Energy	• To make more efficient use of materials and energy; • To substitute existing materials with more environmentally friendly alternatives; • To develop repair processes that would allow the reuse of some materials; • To reduce industrial waste; • To introduce an Environmental Management System within the company; and • To create environmental awareness within the company and train employees in better environmental practices	• 47% reduction in waste coating powder • 25% reduction in chemical usage • 41% reduction in energy usage • 97% recycling of waste coolant oil	£17,500
Waterford Stanley	Reclamation of Vitreous Enamel Overspray	• To recover enamel ground coat from dilute over-spray and equipment washings using recently developed cross-flow micro-filtration technology. The recovered ground coat amounts to approximately 40 tonnes per year. Ultimately, the intention of the company is to extend the system to the reclamation of enamel top coat; • To produce reclaimed material at the required density and of consistent quality without the requirement for chemical addition; and • To install a low maintenance, automated system with low energy consumption.	• 40 tonnes of coating materials recovered for re-use	£24,000

Company	Project Title	Objectives	Environmental Benefit	Economic Benefit
Yeats Room	Minimising Environmental Impact in the Hospital Sector	• Develop an Environmental Management System which would survive into the future; • Present a credible environmental performance; • Reduce the volume of solid waste sent to landfill; • Maintain or reduce current level of energy use; • Reduce water use intake and monitor effluent quality; • Environmental check on purchasing policy; and • Improve the wildlife value of the site.	• Prototype Environmental Management System for the hospitality sector	
Youghal Carpets Yarns	Reduction in Use of Oil, Chemicals, Dyestuffs & Water	• Reduce the overall consumption of heavy fuel oil, chemicals, dyestuffs and water in the plant's dyehouse. • The installation of an Environmental Management System to complement the process improvements and incorporating training of the dyehouse and management employees.	• 10% reduction in heavy fuel oil usage	
Yves Rocher Manufacturing (Irl)	Waste Minimisation in the Cosmetics Sector	• Reduce in the volume of waste water generated on site; • Improve the production yield from the creams fabrication process; and • Reduce the mass of scrap packing components	• 67% reduction in yield losses in cream manufacture; • 53% reduction in water consumption per tonne of product; and • 33% reduction in packaging/filling waste	