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# Auckland Waste Stocktake & Strategic Assessment 2009

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**Prepared for**  
Auckland Regional Council



# Contents

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|          |   |           |
|----------|---|-----------|
| <b>1</b> | <b>Executive Summary</b>  | <b>1</b>  |
| <b>2</b> | <b>Introduction</b>   | <b>3</b>  |
| 2.1      | Background  | 3         |
| 2.2      | National waste policy   | 4         |
| 2.3      | National Waste - Related Legislation                                    | 5         |
| 2.4      | Waste management in the Auckland Region                                 | 8         |
| 2.5      | Regional Waste Priorities   | 9         |
| 2.6      | Waste Data  | 10        |
| 2.7      | Key Terminology   | 12        |
| <b>3</b> | <b>Methodology</b>  | <b>15</b> |
| 3.1      | Sources of key data presented in this report                            | 16        |
| <b>4</b> | <b>Inventory of waste and recovery services and facilities</b>          | <b>18</b> |
| 4.1      | The waste management industry in the Auckland Region                    | 18        |
| 4.2      | Role of local government in regional waste market                       | 33        |
| 4.3      | Inventory of waste facilities   | 40        |
| 4.4      | Diverted materials  | 42        |
| 4.5      | Inventory of territorial authority waste and recovery service contracts | 44        |
| <b>5</b> | <b>Evaluation of current waste and diverted materials generation</b>    | <b>48</b> |
| 5.1      | Council-controlled waste and recycling streams                          | 48        |
| 5.2      | Tonnage and composition of waste to landfill                            | 52        |
| 5.3      | Tonnage and composition of waste to cleanfills and managed fills        | 56        |
| 5.4      | Tonnage and composition of diverted materials                           | 57        |
| 5.5      | Summary of waste disposal   | 58        |
| 5.6      | Correlation with Data to be collected by MfE                            | 60        |
| <b>6</b> | <b>Evaluation of waste data</b>   | <b>61</b> |
| 6.1      | Introduction  | 61        |
| 6.2      | Waste data issues   | 61        |

|          |  |            |
|----------|--|------------|
| 6.3      | Uses of waste data   | 63         |
| 6.4      | Analysis of data required to monitor and measure waste effectively | 64         |
| 6.5      | Priorities and targets and associated data requirements            | 66         |
| 6.6      | Assessment of available waste data                                 | 72         |
| 6.7      | Analysis of available waste data by waste stream                   | 74         |
| 6.8      | Gaps and barriers  | 78         |
| 6.9      | Towards a regional waste data strategy                             | 79         |
| 6.10     | Tools for Improving waste data                                     | 81         |
| 6.11     | Regional Waste Data Strategy Outline                               | 82         |
| 6.12     | Recommended actions  | 83         |
| <b>7</b> | <b>Issues and Opportunities</b>                                    | <b>85</b>  |
| 7.1      | Introduction   | 85         |
| 7.2      | Analysis   | 85         |
| 7.3      | Discussion and Conclusions   | 95         |
| <b>8</b> | <b>References</b>  | <b>97</b>  |
|          | <b>Appendix A: Detailed assessment of data availability</b>        | <b>100</b> |
|          | <b>Appendix B: Council refuse and recycling services</b>           | <b>118</b> |
|          | <b>Appendix C: Analysis of data quality</b>                        | <b>139</b> |

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# 1 Executive Summary

This report presents a stocktake of waste and diverted materials flows and facilities in the Auckland Region. Data and information from local government, business, and key waste and recovered material operators have been compiled to provide a quantitative analysis of waste and diverted materials in the region.

A key context is the upcoming change, from November 2010, to regional governance as one regional council and seven territorial authorities will become a single Auckland Council. This will see the amalgamation of the local authorities' role in respect of waste into a single entity<sup>1</sup>. The Waste Minimisation Act 2008 (WMA) requires every territorial authority to complete a review of its Waste Management and Minimisation Plan (WMMP) by July 2012. Section 51 of the WMA prescribes the requirements for a Waste Assessment which must be completed before a Waste Management and Minimisation Plan is reviewed. This report provides an up-to-date summary of waste generation, movement, diversion, and disposal within the region that will potentially be of value for the Waste Assessment.

The inventory of information on the waste and diverted materials sectors that is presented is necessary to understand the Auckland waste market and some of the idiosyncrasies inherent in it. Landfills, transfer stations, waste collectors, cleanfills, and recovery facilities in Auckland are discussed.

The data and information analysis provides a snapshot of the current waste situation for the new Council and highlights key gaps and opportunities for improvements both now and as the transition to the single Auckland Council takes place. Data from actual measurements of volume and/or composition of waste and diverted materials have been used where they are available. However, there are many waste and diverted material streams for which minimal data are available and in these instances estimates have been used.

It is estimated that Auckland sent 1.4 million tonnes of waste to landfill for the year ending July 2009 and approximately 1.8 million tonnes of waste to cleanfills and managed fills. Materials diverted from landfills, managed fill and cleanfills are estimated at 1.7 million tonnes. This includes commodities<sup>2</sup> (247,000 tonnes), aggregates (980,000 tonnes), organic waste (192,000 tonnes), scrap metals (176,000 tonnes), wood waste (60,000 tonnes), and other materials (12,000 tonnes). Each of these waste and diverted material streams is discussed in more detail in the report.

Managing waste in Auckland will require good data and information to be available. Key gaps in data availability and quality are highlighted in the report and recommendations made for improving information flows.

The Auckland Council will have the challenge of integrating waste management approaches across the region in a manner that enhances efficiency of service delivery

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<sup>1</sup> *The Royal Commission On Auckland Governance* report (March 2009) specifically noted waste as an area in which there was potential for greater regional co-operation and efficiencies.

<sup>2</sup> Includes paper, card, plastic, glass, cans)

while maintaining and improving service quality and contributing to national and regional waste minimisation and environmental objectives.

The report draws three important points from the analysis that need to be addressed if Auckland is to efficiently manage its waste and contribute to meeting national targets. These are:

- The variance between the legislative drivers for waste minimisation and the economic drivers for landfill disposal;
- The absence of a clearly-articulated regional strategic direction for waste,
- Local government only controls about 10% of waste and diverted materials in the region and this will restrict the Auckland Council's ability to influence strategic direction.

## 2 Introduction

### 2.1 Background

Auckland Regional Council engaged Eunomia Research & Consulting Ltd (Eunomia), Sinclair Knight Merz Limited (SKM) and Waste Not Consulting Ltd (Waste Not) to undertake a stocktake of waste and recovered materials flows and facilities in the Auckland Region. As part of this stocktake, Auckland Regional Council requested an assessment of strategic opportunities to reduce waste and an evaluation of existing waste data.

A key context to this report is that from November 2010, regional governance in Auckland will change from 1 regional council and 7 territorial authorities to a single Auckland Council. The single Auckland Council will be a Unitary Authority which will combine the roles of the Regional Council and the Territorial Authorities (TA's). This will see the amalgamation of the local authorities' role in respect of waste into a single entity<sup>3</sup>. The Waste Minimisation Act 2008 (WMA) requires council to complete a review of its Waste Management and Minimisation Plan (WMMP) by July 2012. Section 51 of the WMA prescribes the requirements for a Waste Assessment which must be completed before a waste management and minimisation plan is reviewed. The incoming Auckland Council will need to undertake a Waste Assessment and produce a WMMP. One of the intentions of this report is to provide an up to date knowledge of waste generation, movement, diversion and disposal within the region. This is considered a necessary baseline to support any regional initiatives and future Waste Assessments.

The objective of the project is to provide a comprehensive picture of waste management in the region. This will provide a snapshot of the current situation for the new council and highlight key gaps and opportunities for improvements both now and as the transition to the single Auckland council takes place. Key questions include:

How much waste is going to landfill from the Auckland Region and what is the composition of that waste?

- What quantities and types of waste are being diverted and what are the diversion routes currently available?
- What waste streams could be relatively easily diverted and what role could local authorities play to facilitate this?
- Are there opportunities for local authorities to work with the waste sector and other businesses in the region to improve service availability and outcomes?

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<sup>3</sup> The Royal Commission On Auckland Governance report (March 2009) specifically noted waste as an area in which there was potential for greater regional working and efficiencies.

- Are there opportunities to better integrate the waste management planning framework with broader policy and law<sup>4</sup> at a regional and national level?
- What data is available on each of the waste streams? Is the data adequate for management and policy purposes? What additional data should be collected?

It is important to note that, with the significant role that commercial waste management companies play in providing waste and recycling collection services, particularly for business, the policy framework becomes very important in achieving key waste reduction outcomes. In the context of this report, a key question is how the new Auckland Council can work together with industry to improve waste minimisation. The role of local authorities generally involves providing or contracting services, developing and implementing policy, setting standards through licensing and bylaws and monitoring and enforcement. The Auckland Council will have the challenge of integrating waste management approaches across the region in a manner that enhances efficiency of service delivery while maintaining and improving service quality and contributing to national and regional waste minimisation and environmental objectives.

## 2.2 National waste policy

The New Zealand Waste Strategy, released by the Ministry for the Environment (MfE) in 2002, provided policy guidance to better manage waste in New Zealand. The action programmes outlined in the Strategy included:

- Institutions and legislation - ensuring we have a sound legal framework for waste minimisation and management, with clear roles for central, regional and local government; ensuring good planning, and compliance with international conventions.
- Waste reduction and materials efficiency - developing tools and techniques to reduce waste and maximise re-use, recycling and recovery; removing obstacles to the use of recovered materials, and developing economic incentives to change wasteful behaviour.
- Information and communication - collecting the right information on waste minimisation and management; enhancing community understanding of waste issues and encouraging individual efforts to reduce waste.
- Standards and guidelines - setting consistently high environmental performance standards for waste treatment and disposal, transport and storage; having all waste facilities account for the full cost of their operation and charge accordingly.

The strategy set targets for dealing with various waste streams. Some key targets relate to:

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<sup>4</sup> For example the Local Government Act 2002 including LTCCP, Waste Minimisation Bill, government policy on waste and sustainability and the NZ Waste Strategy.

- Re-using and recycling high-volume wastes (e.g., garden wastes, sewage sludge, and building and demolition wastes);
- Minimising and managing hazardous wastes (e.g., organochlorines<sup>1</sup>, contaminated sites, and hazardous components in business waste);
- Upgrading waste disposal facilities (e.g., closing or upgrading substandard landfills and wastewater treatment plants);
- Charging waste generators the true environmental cost of treatment and disposal (e.g., charging full cost at landfills).

The MfE published a discussion document proposing revised targets in March 2009. This proposed significant changes to the original targets with a short term focus on establishing a base for total waste quantity, waste composition and quantities of key waste streams. For example the proposed Target 1 in the discussion document was to “By 2015, reduce the quantity of waste (tonnes) disposed to landfill per person per year by 20 per cent relative to an established 2010 baseline”. While it is likely that revised targets will be adopted these have yet to be published by MfE.

## 2.3 National Waste - Related Legislation

There are a number of important pieces of legislation that impact on the management of waste in the Auckland region. These are discussed briefly below.

### 2.3.1 The Waste Minimisation Act 2008

The Waste Minimisation Act 2008 (WMA) provides a regulatory framework to waste minimisation that has previously been based on largely voluntary initiatives and the involvement of territorial authorities under previous legislation, including Local Government Act 1974, Local Government Amendment Act (No 4) 1996, and Local Government Act 2002. The purpose of the WMA is to encourage a reduction in the amount of waste disposed of in New Zealand.

In summary, the WMA:

- puts a levy on all waste disposed of in a landfill, initially at \$10 per tonne effective as of 1st July 2009; 50% of the funds collected will be provided to Territorial Authorities (including the new Auckland Council) to be spent on the implementation of their Waste Minimisation and Management Plans. The remainder, less any administration costs, will go into a contestable fund for waste minimisation initiatives,
- facilitates or enforces producers, brand owners, importers, retailers, consumers and other parties to take responsibility for the environmental effects of their products – from ‘cradle-to-grave’ through voluntary and mandatory product stewardship schemes. There may be implications for local authorities which

currently deal with these products in their waste streams or who are party to voluntary programmes,

- allows for regulations to be made making it mandatory for certain groups (for example, landfill operators) to report on waste to improve information on waste minimisation. This will impact councils owning or operating landfills,
- clarifies the roles and responsibilities of territorial authorities with respect to waste minimisation e.g. updating Waste Minimisation Plans and collecting/administering levy funding for waste minimisation projects, and
- introduces a new Waste Advisory Board to give independent advice to the Minister for the Environment on waste minimisation issues.

### 2.3.2 Emissions Trading Scheme (ETS)

It is noted that the Climate Change (Emissions Trading) Amendment Act 2008 is currently under review by the new Government. Significant changes to the waste elements are not anticipated however. In its current form it will require landfill owners to surrender emission units to cover methane emissions generated from the landfill. Should any future solid waste incineration plants be constructed, the Act would also require emission units to be surrendered to cover carbon dioxide, methane and nitrous oxide emissions from the incineration of household wastes. The waste sector will not formally enter the ETS until 1 January 2011, at which time voluntary reporting can occur. Mandatory reporting requirements will apply from January 2012 and emission units will need to be surrendered as of 2013.

The method for calculating emissions from landfills and incinerators is yet to be regulated<sup>5</sup>. This means it is not yet possible to calculate the impacts although the net impact of the ETS on the waste sector is likely to be to increase the cost of landfilling. If no methane capture systems are in place in a landfill this would have the effect of increasing landfill costs by approximately \$25-\$30 per tonne (roughly equivalent to the price of per tonne of carbon). The landfills serving the Auckland Region all do capture methane and so this cost increase is likely to be lower for Auckland.

Nevertheless the impact from the ETS (particularly if combined with the impacts of the landfill levy) is likely to be to encourage more businesses to find alternatives to landfilling their waste, with a likely impact of increasing demand for the various recycling services that exist in Auckland.

### 2.3.3 Local Government Act 2002

Key requirements of the Local Government Act 2002 (the LGA) relate to the decision making process territorial authorities must follow; considering present and future social, economic, environmental and cultural well being. The implications of a decision regarding waste management should be assessed according to this requirement.

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<sup>5</sup> The expectation is that Government will work with industry to do so during 2009 and 2010

The LGA also sets out the consultative process that must be followed when a Waste Management Plan, and now a WMMP, is reviewed. Minor amendments are possible through the annual or other planning processes, but a 'significant' review requires that a special consultative process is carried out.

#### 2.3.4 The Resource Management Act 1991 (RMA)

The RMA provides guidelines and regulations for the sustainable management of natural and physical resources. Although it does not specifically define 'waste', the Act addresses waste management and minimisation activity through controls on the environmental effects of waste management and minimisation activities and facilities through national, regional and local policy, standards, plans and consent procedures. In this role, the RMA exercises considerable influence over facilities for waste disposal and recycling, recovery, treatment and others in terms of the potential impacts of these facilities on the environment.

Under section 30 of the RMA, regional councils are responsible for controlling the discharge of contaminants into or onto land, air or water. These responsibilities are addressed through regional planning and discharge consent requirements. Other regional council responsibilities that may be relevant to waste and recoverable materials facilities include managing the adverse effects of storing, using, disposing of and transporting hazardous wastes; the dumping of wastes from ships, aircraft and offshore installations into the coastal marine area; and the allocation and use of water.

Under the RMA, TA responsibility includes controlling the effects of land-use activities that have the potential to create adverse effects on the natural and physical resources of their district. Facilities involved in the disposal, treatment or use of waste or recoverable materials may carry this potential. Permitted, controlled, discretionary, non-complying and prohibited activities and their controls are specified within district planning documents, thereby defining further land-use-related resource consent requirements for waste-related facilities.

In addition, the RMA provides for the development of national policy statements and for the setting of national environmental standards (NES). There is currently one enacted NES that directly influences the management of waste in New Zealand – the Resource Management (National Environmental Standards Relating to Certain Air Pollutants, Dioxins, and Other Toxics) Regulations 2004 (the NES for Air Quality). This NES requires certain landfills (e.g., those with a capacity of more than 1 million tonnes of waste) to collect landfill gases and either flare them or use them as fuel for generating electricity. The result is increased infrastructure and operational costs for qualifying landfills, although with costs potentially offset by the harnessing of captured emissions for energy generation.

Unless exemption criteria are met, the NES for Air Quality also prohibits the lighting of fires and burning of wastes at landfills, the burning of tyres, bitumen burning for road maintenance, burning coated wire or oil, and the operation of high-temperature hazardous waste incinerators. These prohibitions limit the range of waste

treatment/disposal options available within New Zealand with the aim of protecting air quality.<sup>6</sup>

### 2.3.5 The Hazardous Substances and New Organisms Act 1996 (the HSNO Act)

The HSNO Act addresses the management of substances that pose a significant risk to the environment and/or human health, from manufacture to disposal. The Act relates to waste management primarily through controls on the import or manufacture of new hazardous materials and the handling and disposal of hazardous substances.

Hazardous substances may be explosive, flammable, have the capacity to oxidise, toxic to humans and/or the environment, corrosive, or have the ability to develop any of these properties when in contact with air or water. Depending on the amount of a hazardous substance on site, the HSNO Act sets out requirements for material storage, staff training and certification. These requirements would need to be addressed within operational and health and safety plans for waste facilities. Hazardous substances commonly managed by TAs include used oil, asbestos, agrichemicals, LPG and batteries.

The HSNO Act provides minimum national standards that may apply to the disposal of a hazardous substance. However, under the RMA a regional council or TA may set more stringent controls relating to the use of land for storing, using, disposing of or transporting hazardous substances.<sup>7</sup>

## 2.4 Waste management in the Auckland Region

The management, diversion, and disposal of waste in the Auckland Region involves local authorities (Auckland Regional Council, City and District Councils) and the private sector. While organisations in each of these categories undertake discrete activities, there is also collaboration on specific issues and in some cases in providing services.

**Territorial authorities (City and District Councils)** have responsibilities under the Waste Minimisation Act 2008 and Local Government Act 2002 to provide for the management of waste in their city/district. This includes the responsibility to have a Waste Minimisation and Management Plan and the ability to provide services and/or regulate waste management through by-laws. The majority of household waste is collected on behalf of city/district councils around the region. Waitakere City Council operate the Waitakere Refuse and Recycling Transfer Station for both commercial and household waste. Territorial authorities also issue land use consents under the Resource Management Act 1991 for waste transfer, processing and/or disposal facilities.

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<sup>6</sup> Taken from: Ministry for the Environment (2009) Waste Minimisation in Waste Management and Minimisation Planning - Guidance for Territorial Authorities, Wellington

<sup>7</sup> *ibid*

The **Auckland Regional Council** sets policy on a wide range of environmental issues through the Auckland Regional Policy Statement (currently being reviewed). The Auckland Regional Policy Statement provides policy on issues including impacts of urban growth on the environment, which includes waste generation, disposal and processing in the Auckland Region. Auckland Regional Council also monitors and enforces resource consent conditions that apply to the operation of waste facilities.

**Environment Waikato** (the trading name of the Waikato Regional Council) sets policy for the Waikato Region through the Regional Policy Statement. This is of relevance to the Auckland Region due to the disposal and processing of materials from the Auckland Region in facilities such as North Waikato Regional Landfill (commonly referred to as Hampton Downs landfill) near Meremere, and Envirofert Limited (south of Tuakau). Data collected by Environment Waikato through consent conditions will be of use in developing estimates of waste generation and disposal for the Auckland Region.

The **private sector** plays a major role in the collection, processing and disposal of waste from the Auckland Region. With the exception of household waste collections provided by city/district councils, materials passing through the Waitakere Refuse and Recycling Transfer Station, Whitford Landfill and a small number of other minor facilities, most materials are collected and disposed/processed by commercial operators. An overview of the Auckland waste management market is provided in Section 3.1.

The current re-organisation of local government structure in the Auckland Region will have an impact on the development of policy and management of waste. The structure of the new Auckland Council has yet to be clearly articulated, but it is likely that it will have some similarity to Unitary Authorities operating in other parts of New Zealand. This will mean that there will be:

- A part of the new council assuming the responsibility of a territorial authority under the Local Government Act 2002, Resource Management Act 1991, and Waste Minimisation Act 2008. Over time this part of the council will need to amalgamate policy, by-laws, and develop an Auckland Waste Minimisation and Management Plan. There may also be some efficiencies to be gained from amalgamation of waste management contracts and services (collection, processing and disposal).
- A part of the council assuming the responsibility of a Regional Council under the Local Government Act 2002 and the Resource Management Act 1991. This will include setting regional policy through a Regional Policy Statement and regulating discharges from disposal and processing facilities.

## 2.5 Regional Waste Priorities

In 2006 the Auckland Waste Officers Forum appointed a team to develop a policy framework for a regional approach to waste minimisation. This included the appointment of a Working Group comprising a representative from each of the seven

territorial authorities in the region to develop and manage a regional waste management strategy. There was regional agreement in principle at the CEO/Mayoral Forum level to pursue these efforts to develop a regional strategy. In 2007, the Working Group commissioned Morrison Low & Associates Ltd to prepare a report setting out regional priority waste streams at a regional level and recommending regional projects that would reduce waste to landfill<sup>8</sup>.

The methodology for developing the report included reviewing the seven councils' waste management plans to identify common priorities regarding waste reduction activity. Using a set of criteria developed by the Working Group, the priority areas were ranked, with priority actions being identified. These priority actions were then costed, using known or estimated costing data.

We note that this report currently remains as a draft. It is our understanding that whilst many of the participating councils were seeking to finalise the regional strategic priorities work and move to the next stage of developing a regional strategy and WMMP, agreement was not unanimous, and so the project was put on hold.

From the August 2007 draft copy of the report that was available, the five priority waste streams and their associated action plans are summarised in Table 1.

## 2.6 Waste Data

An important area of focus in the report is an assessment of the quality and availability of waste data in the Auckland region. Waste data are necessary for the setting and monitoring of policies, strategies, and targets, as well as the management of waste and recovery services and facilities. As is discussed in this document, waste management and planning has historically been the focus of Territorial Authorities and central government and there has been relatively limited strategic direction at a regional level. This has been reflected in the gathering and analysis of waste data with data tending to be generated and managed at the local rather than regional level. With the impending transition to a single Unitary Authority, there will be a need to gather and evaluate waste data on an Auckland region-wide basis. It is therefore an opportune time to assess what data are available, what might be needed for policy and strategic purposes, and how to address any gaps or barriers to establishing a useful waste data programme. Section 5 examines these issues further.

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<sup>8</sup> (Morrison Low 2007 *Regional Strategic Priorities for Waste - Draft*)

**Table 1** Priority waste streams in Auckland Region (Morrison Low report)

| Priority waste stream  | Rank | Action points  |
|--|------|--|
| Organic waste  | 1    | <ul style="list-style-type: none"> <li>Feasibility study of a compost/treated organics market</li> <li>Development of organics composting operation</li> <li>Implementation of household organics collection</li> <li>Investigation of commercial organics collection service</li> <li>Educational programme for encouraging home composting</li> </ul>              |
| Hazardous waste (e.g. used oil, paint)   | 2    | <ul style="list-style-type: none"> <li>Continue to provide hazardous waste collection and reuse/recycling schemes</li> <li>Enhance collection services</li> <li>Research and development of hazardous waste collection/recycling market</li> <li>Marketing/behavioural change campaign</li> </ul>  |
| Recyclables and packaging  | 3    | <ul style="list-style-type: none"> <li>Feasibility study into alternative markets for recyclables</li> <li>Enhanced collection services for some areas</li> <li>Development of drop-off facilities and MRFs for some areas</li> <li>Public place recycling bins</li> <li>Public event recycling facilities</li> <li>Marketing/behavioural change campaign</li> </ul> |
| Inorganic/special wastes (e.g. tyres, end of life vehicles, e-waste, timber, asbestos) | 3    | <ul style="list-style-type: none"> <li>Investigate options for alternative collection mechanisms</li> <li>Market development for reuse/recycle of recovered wastes</li> <li>Resource recovery parks with facilities and shops for wastes</li> <li>Marketing/behavioural change campaign</li> </ul>   |
| Illegal dumping and litter   | 3    | No action plan   |
| C&D waste  | N/A  | <ul style="list-style-type: none"> <li>Market development for reuse/recycle of recovered C&amp;D wastes</li> <li>Resource recovery parks with facilities for C&amp;D waste</li> <li>Investigate options to encourage separation of C&amp;D wastes onsite</li> <li>Investigate options to reduce C&amp;D waste through design</li> <li>Leading by example</li> </ul>  |

## 2.7 Key Terminology

|                                      |  |
|--------------------------------------|--|
| Business/Commercial Waste            | Non-household waste. This is predominantly waste generated by private sector business or commercial enterprises but may also include waste from government offices, schools, community organisations etc.  |
| C&D Waste                            | Waste materials from the construction or demolition of a building, including the preparation and / or clearance of the property or site.   |
| Cleanfill                            | <p>(From the MfE Guide to the Management of Cleanfills, MfE, 2002)</p> <p>Material that when buried will have no adverse effect on people or the environment. Cleanfill material includes virgin natural materials such as clay, soil and rock, and other inert materials such as concrete or brick that are free of:</p> <ul style="list-style-type: none"><li>combustible, putrescible, degradable or leachable components</li><li>hazardous substances</li><li>products or materials derived from hazardous waste treatment, hazardous waste stabilisation or hazardous waste disposal practices</li><li>materials that may present a risk to human or animal health such as medical and veterinary waste, asbestos or radioactive substances</li><li>liquid waste.</li></ul> <p>A cleanfill is any landfill that accepts only cleanfill material as defined above.</p> |
| Commodities                          | Recyclable materials for which there are recognised commercial markets. The general use of the terms includes paper, cardboard, glass bottles, cans, ferrous and non-ferrous metals, and plastics. These materials are often traded internationally in commodities markets   |
| Diverted materials                   | means any thing that is no longer required for its original purpose and, but for commercial or other waste minimisation activities, would be disposed of or discarded  |
| Domestic Waste                       | Waste from households.   |
| Domestic Kerbside Refuse Collections | Kerbside refuse collections offered by councils or private waste operators to householders and small businesses  |
| Hazardous Wastes                     | <p>The most common types of hazardous wastes include:</p> <ul style="list-style-type: none"><li>Organic liquids, such as those removed from septic tanks and industrial cesspits</li><li>Solvents and oils, particularly those containing volatile organic compounds</li><li>Hydrocarbon-containing wastes, such as inks, glues, and greases</li><li>Contaminated soils (lightly contaminated soils may not require treatment prior to landfill disposal)</li><li>Chemical wastes, such as pesticides and agricultural chemicals</li><li>Medical and quarantine wastes</li><li>Wastes containing heavy metals, such as timber preservatives</li></ul>  |

|                       |  |
|-----------------------|--|
|                       | Contaminated packaging associated with these wastes.   |
| Inorganic             | This term is generally well defined. It is commonly used to refer to bulky household items such as furniture, whiteware, electronic goods and other similar consumer items   |
| Landfill              | A disposal facility as defined in section 7 of the Waste Minimisation Act (2008), excluding incineration   |
| Local Authority       | A regional council or territorial authority  |
| Managed fill          | A disposal site requiring consent from the Auckland Regional Council to accept well defined types of non municipal wastes. These are generally 'cleanfills' that are consented to accept low-level contaminated soils.   |
| Monofill              | The deposition on land of 'cleanfill' type material of a single uniform composition. Monofills are commonly the outputs of an industrial process.  |
| Municipal Solid Waste | Waste disposed of to landfill comprising domestic waste and council collected waste from commercial activities.  |
| Organic waste         | The term "organic waste" in the context of this report refers to the putrescible waste category used in the Solid Waste Analysis Protocol <sup>9</sup> (SWAP). This includes garden waste (more commonly known as "green waste"), food scraps and commercial organic wastes such as food-processing waste. Some other wastes may biodegrade in landfill but are identified separately in SWAP audits. This includes paper, cardboard and untreated wood. |
| Recovery              | (a) means extraction of materials or energy from waste or diverted material for further use or processing; and<br>(b) includes making waste or diverted material into compost  |
| Recycling             | means the reprocessing of waste or diverted material to produce new materials  |
| Special Waste         | The term special waste is used in a number of different ways. In this document we have adopted the definition used in the New Zealand Waste Strategy 2002. Under this definition 'Special wastes' include used oil, tyres, end of life vehicles, batteries and electronic goods  |
| Territorial Authority | A city council or a district council   |
| Transfer station      | A general term for a facility where waste is consolidated, possibly processed to some degree, and transported to another facility for disposal, recovery or reuse.   |
| Unitary Authority     | A territorial authority that has the responsibilities, duties, and powers of a regional council conferred on it  |
| Waste                 | Waste means:<br>(a) means any thing disposed of or discarded; and<br>(b) includes a type of waste that is defined by its composition or source (for example, organic waste, electronic waste, or construction and demolition waste) ; and<br>(c) to avoid doubt, includes any component or element of diverted material, if the component or element is disposed of or discarded   |

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<sup>9</sup> Ministry for the Environment Solid Waste Analysis Protocol, 2002

|   |   |
|---|---|
| Waste Assessment                              | As defined in s51 of the Waste Minimisation Act (2008). A waste assessment must be completed whenever a WMMP is reviewed  |
| Waste Management and Minimisation Plan (WMMP) | As defined in s43 of the Waste Minimisation Act (2008). It is a statutory requirement for all territorial authorities to have a WMMP that meets the requirements of the Act in place by July 2012 |

## 3 Methodology

The collection of waste and recycling data is a challenging task. There are a wide range of organisations involved and much data is commercial sensitive. Issues with the definition of waste (when considering what recovered or diverted materials should be included) and the ease of movement of waste across local and regional boundaries makes the task of collating meaningful data more difficult.

The intent of this project has been to assess readily available information in order to determine the movement of waste and diverted materials into, around and out of the Auckland Region. The focus has been on waste disposed of to landfill, cleanfill, recycling commodities (glass bottles/jars, metal cans, paper/cardboard and plastics code 1 & 2), scrap metal and organic waste composted or processed for other beneficial use such as biofuel. Other collection and processing of by-products has been identified where possible but not necessarily quantified due to the lack of meaningful data. Examples include the use of wood waste for biofuel within a single operation and the diversion of food processing waste for use as stock food. Organic waste processed via home composting and waste disposed of to on-farm sites has not been quantified.

Information regarding waste flows and quantities has been aggregated at a regional level and was collected from a wide range of sources including:

- existing reports on waste management in the Auckland Region
- searching web databases such as Yellow Pages, UBD and Finda for listings for waste and recycling companies
- reviewing overview information on industry and services in the Auckland Region – EECA Heat Plant Database, Local Authority websites, websites for major waste and recycling companies and websites for ; and
- telephone calls and/or site visits with local authorities, key waste sector organisations and a selection of major businesses operating in the Auckland region.

It is important to note that while some data is accurate, other parts of the dataset are by necessity based on estimates. Good data was collected regarding:

- the quantity of waste disposed of to municipal waste landfill (via weighbridge records)
- the quantity of commodities recycled (via trading/weighbridge records)
- The composition of waste disposed of to municipal waste landfills; and
- The quantity of organic waste composted at commercial operations

Quantities for the following waste streams were estimated based on the information sources above:

- the quantity of wood waste utilised for boiler fuel (based on published data from EECA and discussions with boiler fuel suppliers and operators)
- the quantity of commercially sourced scrap metal recycled (based on estimates from the Scrap Metal Recycling Association of NZ and published for the key recycling facilities) and
- the quantity of waste disposed of to cleanfills (based on consent quantity and composition limits)

### 3.1 Sources of key data presented in this report

#### **Quantity of waste disposed of to landfill**

Quantity of waste from the Auckland Region to landfill:

- Auckland Regional Council (for Redvale and Whitford Landfills)
- Envirowaste (waste from the Auckland Region disposed of at Hampton Downs Landfill)
- Environment Waikato (total waste disposed of at Hampton Downs Landfill); and
- Project team - waste entering the Auckland Region from Northland deducted from the analysis

Quantity of waste from the Auckland Region to cleanfills and managed fills:

- Estimate based on per capita basis and figures from other parts of New Zealand; and
- Estimate based on consented limits for major disposal sites; and
- Published data for Watercare (Pond 2 monofill) and NZ Steel (Glenbrook).

Composition of waste disposed of to landfill:

- Composition of waste from the Auckland Region to landfill
- Remove sludge/contaminated soil disposed of to landfill
- Solid Waste Analysis Protocol (SWAP) Survey results for general waste
- Composition of waste from the Auckland Region to cleanfills and managed fills:
- Cleanfills – assume 2% green waste, 30% Construction and Demolition waste, remainder 'inert' soil/rock.
- Managed fills – information from the ARC and site operators regarding materials disposed.

### **Quantity of materials recycled**

- Discussions with key materials aggregators/processors with all key organisations providing indicative quantities.

## 4 Inventory of waste and recovery services and facilities

This section provides an overview of the waste management sector in the Auckland Region. Section 3.1 provides an overview of the market. Section 3.2 notes the role of local government in waste management in the Auckland Region. Sections 3.3 and 3.4 provide a listing of all main waste and recovery services and facilities in the Auckland Region and, where relevant, the interactions between them. The comments cover both publicly and privately owned facilities. There are many small private operators, in both the waste and recycling industries, and it is not considered practical, or necessary, to include all of these separately in such an inventory. Second-hand businesses (e.g. antique dealers, second-hand car yards etc) have not been included. Section 3.5 provides an inventory of current (July 2009) local authority waste collection, processing, and disposal contracts.

### 4.1 The waste management industry in the Auckland Region

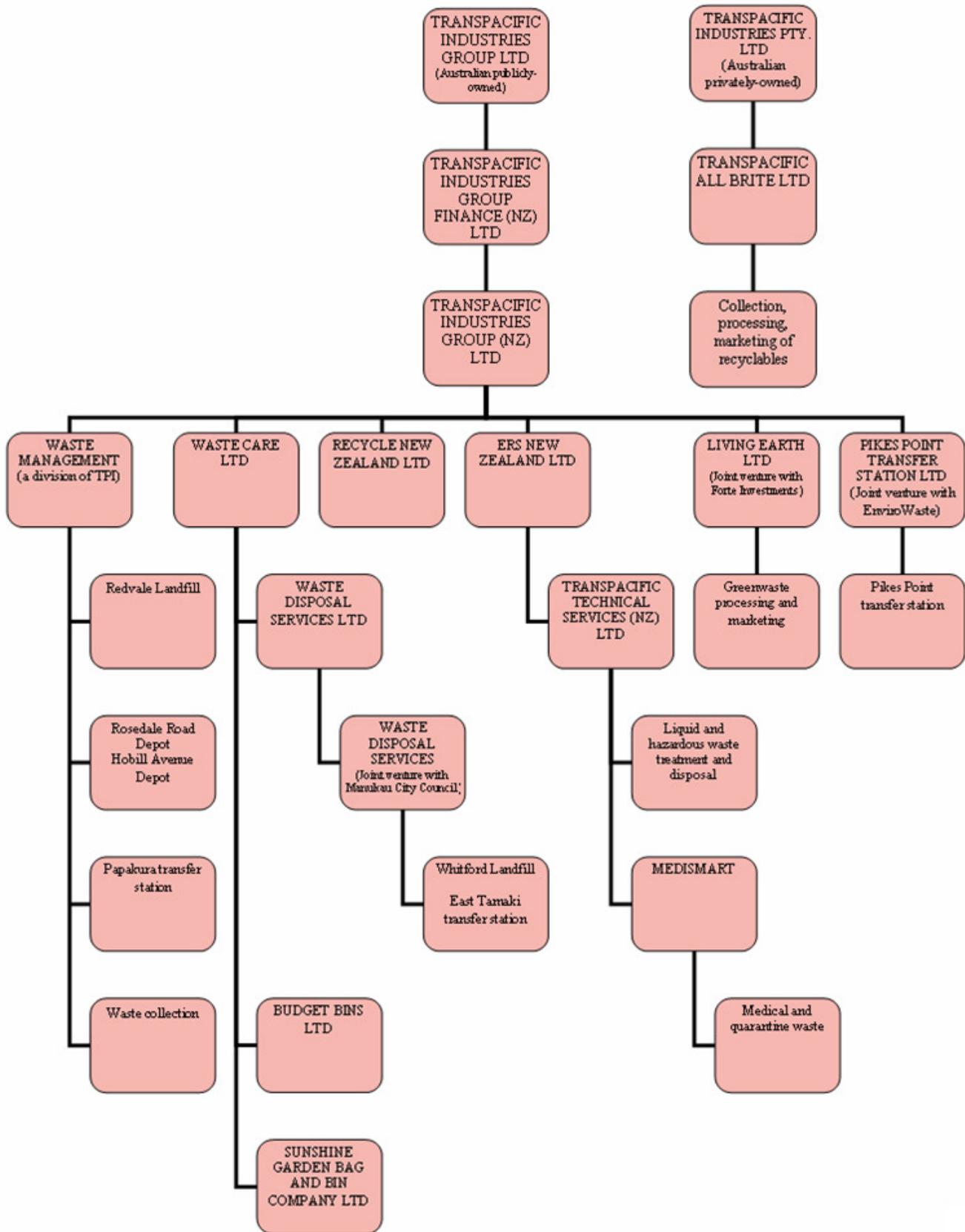
The Auckland region waste and recovered materials market differs from others in New Zealand in terms of its size, complexity, the geographic area it serves, and ownership of the infrastructure (transfer stations, materials recovery facilities, and landfills).

Many New Zealand waste markets feature strong local authority involvement in infrastructure ownership, generally with single landfills serving geographically distinct waste catchments. The Auckland waste disposal market on the other hand is largely served by privately-owned landfills that receive most of the waste from Far North District in the north to Waipa District in the south, a distance of 400 kilometres.

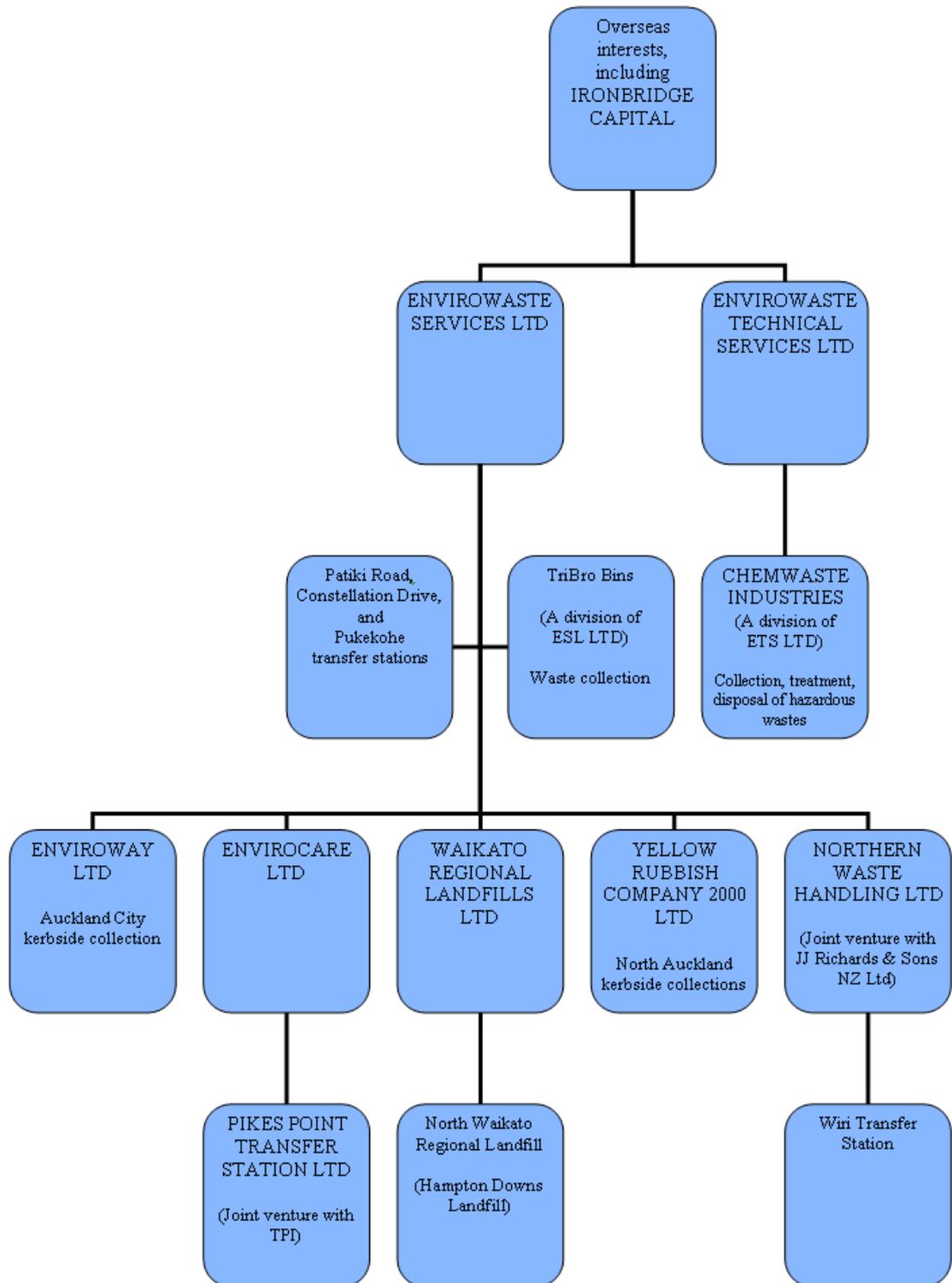
This distinct market has developed primarily over the last ten years, with two main factors resulting in most of the changes – the privatisation of publicly-owned assets and the closures of small landfills, largely due to the introduction of the Resource Management Act 1991.

The waste management industry in the region, including landfills, is currently dominated by two private sector companies - Transpacific Industries Group (NZ) Ltd (TPI) and EnviroWaste Services Ltd (EnviroWaste). Organisational charts for the two companies are presented below (Fig. 1 and Fig. 2). These charts show only the major relevant assets owned by the two companies that operate in the Auckland region.

Figure 1 TPI in the Auckland region



**Figure 2** EnviroWaste Services Ltd in the Auckland Region



#### 4.1.1 Municipal landfill market

Up until the early 1990s, the Auckland waste market comprised publicly-owned landfills, a mix of public-and privately-owned transfer stations, and a largely privately-controlled waste collection market. At that time, with the Pikes Point landfill in Onehunga having closed in the previous decade and the Kay Road Balefill in Swanson approaching closure, there were three major landfills serving the region – Rosedale, in North Shore City, Greenmount in East Tamaki, and Whitford in Manukau City – and two smaller facilities in Lawries Road, Rodney District, and Hunua Gorge, Papakura, that had a very limited lifespan.

All of the operating landfills at the time were at least partly in public ownership. Whitford Landfill was owned and operated by Waste Disposal Services, a joint venture between Manukau City Council and Waste Care Ltd (now part of TPI), and Rosedale and Greenmount landfills were owned by EnviroWaste. At that time, EnviroWaste was a joint venture company owned by Northern Disposal Services and Fulton Hogan Ltd. Northern Disposal Services in turn was wholly-owned by the Auckland Regional Services Trust (later to become Infrastructure Auckland).

The first major step towards privatisation of the waste market was the opening in 1993 of Redvale Landfill, by Waste Management N.Z. Ltd (now part of TPI), in Albany, north of Auckland. The second step towards privatisation was the sale, in November 2001, by Infrastructure Auckland, of its 50% shareholding in EnviroWaste to Fulton Hogan Ltd.

By 2005, there were only three major landfills serving the Auckland market, with Rosedale and Greenmount (which still operates as a 'managed fill' site) having closed, and EnviroWaste having opened the Hampton Downs Landfill, in the Waikato. Of the three major facilities, the only local government involvement is Manukau City Council's joint venture with Waste Management (a division of TPI) in Waste Disposal Services, which owns and operates Whitford Landfill and the East Tamaki Transfer Station. Claris Landfill, on Great Barrier Island, a very small facility, is owned by Auckland City Council.

Based on data provided by landfill operators to Auckland Regional Council for this project<sup>10</sup>, an estimate has been made of 1.4 million tonnes of waste from the Auckland Region being landfilled for the year to July 2009. This figure does not include material being disposed of at cleanfills or waste from outside the Region that is disposed of at the landfills serving the Auckland Region. This estimate is presented and explained further in Section 4.2.

The barriers to entry into the landfill market are significant, with substantial capital investment being required for site testing, land purchase, and the resource consent process. The outcomes of the consent process are far from certain, putting at risk the initial capital investment. Due to these barriers, it is unlikely that there will be any further entries into the Auckland landfill market until required by the closure of Redvale, expected to be within twenty years.

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<sup>10</sup> Tonnage figures for the individual landfills are not publicly available due to their commercially sensitive nature.

To sustain the high fixed costs associated with operating sanitary landfills to the standard required by the Resource Management Act, and to provide an acceptable return on the original capital investment, it is essential for landfill operators to maintain control of an economic volume of waste by establishing 'ownership' of that waste as close as possible to its point of generation. In the waste industry, this is referred to as 'flow control', and competition for flow control between the two landfill operators, EnviroWaste and TPI, is one of the formative features of the current Auckland region waste market.

The third major landfill, Whitford Landfill, is less involved in the competitive market. The facility is limited by the terms of its resource consents to receiving 200,000 tonnes of waste per year. The two joint venture partners, Manukau City Council and Waste Management, between them control a sizable proportion of this volume. In addition, as Whitford Landfill has been operating since the 1970s, the 'sunk' capital requiring a high rate of return is likely to be markedly lower than for the more recently-established facilities.

To improve their position in the competition for flow control and maintain 'ownership' of the waste stream, both of the major landfill operators are vertically integrated entities. That is, they operate waste collection services, transfer stations for accepting waste from the public and third-party waste operators prior to consolidation, bulk haulers, and landfills.

#### 4.1.2 Transfer stations and bulk haulage market

When the landfills serving Auckland were within the urban areas of the region, waste was delivered directly to the facilities. Now that the major landfills are considerable distance from the urban areas, it has become necessary to establish transfer stations for the aggregation of waste, which is then bulk hauled to the landfills. Although the figures are commercially sensitive and have not been made available for this study, bulk waste from transfer stations is likely to comprise the largest component of waste being disposed of at the landfills serving the region, estimated to be in the region 40%.

Entry into the transfer station market is much less costly than the landfill market, with capital costs and operating costs being much lower and resource consents being significantly easier to obtain. Between them, the two major landfill operators in the Auckland region control the operation of nine<sup>11</sup> of the seventeen main transfer stations throughout the region<sup>12</sup>. These transfer stations are, for the most part, situated in the central core of the region, with territorial authorities and smaller waste operators operating transfer stations in some smaller centres. While most of the transfer stations are open to the public, some accept only waste from commercial operators.

To facilitate the economically-viable collection of waste in all areas of the Auckland region and so protect their market share, both EnviroWaste and TPI operate region-

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<sup>11</sup> TPI also operate two transfer stations on contract to council – Devonport and Waiheke bringing the total to 11 if these are included.

<sup>12</sup> There is no specific definition of what constitutes a transfer station. Many smaller operators will run their own transfer facilities to bulk and process waste they collect. For the purposes of this report these have not been quantified.

wide networks of transfer stations, even though this results, in some instances, in competing transfer stations being situated in close proximity. Examples of this are EnviroWaste's Constellation Drive transfer station and TPI's Rosedale Road depot, on the North Shore. The locations and ownership of transfer stations are shown in Figure 3.

To the north of the region, Mason Contractors Ltd and Metropolitan Waste Ltd operate transfer stations in the Wellsford, Warkworth, and Silverdale areas. In the west, Waitakere City Council owns and operates the only major council-owned transfer station in the region, the Waitakere Refuse and Recycling Station, and in the east is the public-private joint venture owned East Tamaki Transfer Station.

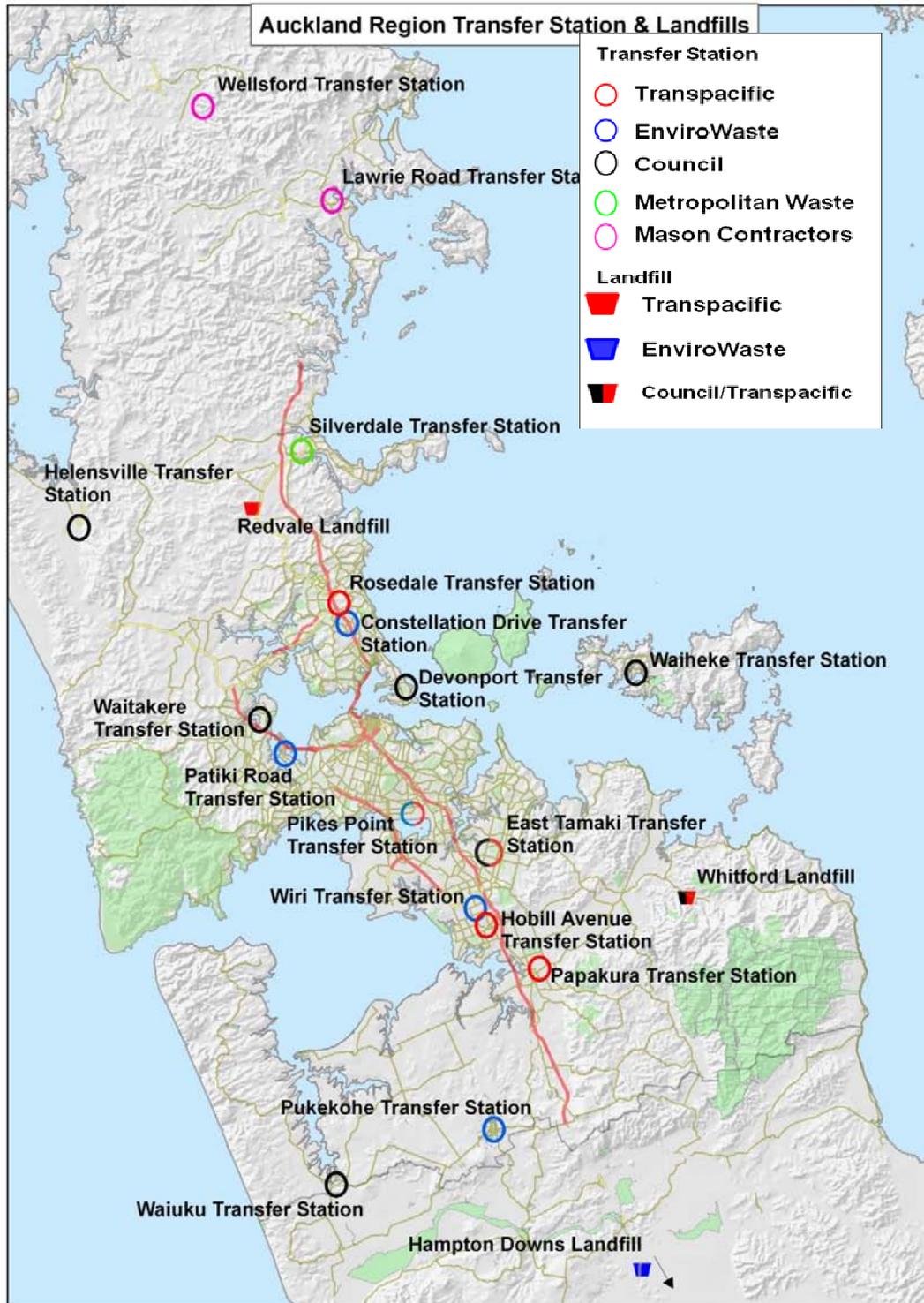
In total, three of the transfer stations are in joint ownership. Pikes Point is owned by Pikes Point Transfer Station Ltd, a joint venture between TPI and EnviroWaste. Wiri transfer station is owned by Northern Waste Handling Ltd, a joint venture between EnviroWaste and JJ Richards. More detailed information on transfer stations is presented in Section 3.3.1.

With TPI's Redvale Landfill being to the north of the metropolitan Auckland area, and EnviroWaste's Hampton Downs Landfill being to the south, the operation by each company of a region-wide network of transfer stations potentially creates transport inefficiencies, with each operator needing to bulk haul waste from one end of the region to the other. This issue has been addressed, to an extent that is uncertain due to the commercial sensitivity of the information, by the landfill operators 'swapping' waste from transfer stations. Under this arrangement, both of the landfills are understood to accept quantities of waste from the other company's transfer stations.

The waste 'swapping' ameliorates some of the trans-region hauling that would otherwise eventuate and, to an extent undisclosed by the operators, rationalises bulk hauling in the region. For example, some (if not most or all) of the waste from EnviroWaste's Constellation Drive transfer station on the North Shore is transported to TPI's Redvale Landfill. Similarly, some (if not most or all) waste from TPI's Papakura transfer station is transported to EnviroWaste's Hampton Downs Landfill.

Balance is reportedly maintained in the 'swapping' arrangement by the landfill operators monitoring the 'swap' tonnages and, when necessary, diverting bulk hauling from an individual transfer station to the other landfill. Pikes Point transfer station, which is operated as a joint venture by both landfill operators, is centrally-located and waste from the facility could, if required, be directed to either Redvale Landfill or Hampton Downs Landfill to maintain the balance. The swapping arrangement between TPI and EnviroWaste has, until recently, been based on contracts entered into every eighteen months. At present, there is no formal contract in place for the swapping arrangement. Although it is a private arrangement between two commercial entities, the waste swapping arrangement is clearly of strategic importance to the efficient operation of waste flows in the region. If this arrangement were to break down for any reason it could result in increases in waste costs, increased bulk haulage movements and resulting congestion and associated negative environmental impacts.

Figure 3 Transfer station and landfill locations



The issue of transportation of waste is particularly pertinent in the Auckland Region as Auckland has significant transportation / congestion problems which create inefficiencies, not only in the waste transportation industry but to the wider Auckland and New Zealand economy. The existing rail network, with the main trunk lines location near key RTS and the Hampton Downs Landfill does provide opportunities for transportation with associated efficiency gains. As long as waste (and diverted materials) is required to be moved significant distances there will be transportation issues and this means that long term solutions to haulage will be important

#### 4.1.3 . Waste collection market

The barriers to entry into the waste collection market are much lower than into the landfill and transfer station market, and this is reflected by the substantial number of waste collectors active in the Auckland region. There is a high degree of operator turnover in the waste collection market, with a high attrition rate amongst the small operators and numerous acquisitions of smaller operators by TPI and EnviroWaste.

Other than each other, the main competition to TPI and EnviroWaste in the waste collection market comes from overseas entities attempting to gain a foothold in the Auckland market. Recent Australian entrants to the Auckland collection market include J.J. Richards, which operates in the commercial collections market and is, with EnviroWaste, a joint owner of the Wiri transfer station. Cleanaway Australia, which entered the New Zealand market with local authority collection contracts as EnviroWay Ltd, was a joint venture with EnviroWaste. Cleanaway Australia was purchased by TPI in 2007, and EnviroWay is now totally owned by EnviroWaste. Another Australian company has also entered the recycling collection market, with Thiess Services Pty Ltd wholly-owned subsidiary Thiess Services New Zealand Ltd now having the Auckland City kerbside recycling collection contract.

Entry into the New Zealand markets by overseas interests is not always long-lived, and frequent change of ownership is a feature of the marketplace. Waste Management NZ Ltd was, in the late 1990s, owned 60% by WMX Technologies of the United States, then was largely New Zealand-owned through its New Zealand Stock Exchange listing, and then, after 'merging' with Australian-owned TPI, is now totally Australian-owned. In another change of ownership involving foreign-controlled companies, in 1999, Waste Management NZ Ltd received Commerce Commission approval to acquire Waste Care Ltd, from its French owners, Sita S.A, at the time owned 63% by Suez Lyonnaise des Eaux of France.

More recently, Onyx Group Limited (owned by the French Veolia Proprete), which entered the New Zealand market in 1995, had declined in the scope of its activities, and is now limited to North Shore and Waitakere City's kerbside refuse and recycling contracts. Its commercial collection assets were sold to J.J. Richards.

New entrants to the Auckland collection market may be disadvantaged by the need to make disposal arrangements at a transfer station or landfill that is operated by either TPI or EnviroWaste, organisations against which they might be competing in the

collection market. The vertical integration of TPI and EnviroWaste has the potential to allow them to price their services competitively compared to companies operating only in the collection market.

Whereas the 'swapping' arrangement that exists between TPI and EnviroWaste has, to an unknown extent, rationalised the bulk hauling of waste in the region, there is little such rationalising in the waste collection market, which generates a much greater number of vehicle movements. There may be some 'swapping' of waste loads that are disposed of directly to landfill, but, for the most part, waste collected by either TPI or EnviroWaste that does not go directly to landfill will be disposed of at one of that company's transfer stations, rather than at the nearest facility.

It is likely that the competition in the waste collection and disposal markets results in lower collection and disposal costs to waste generators than would otherwise be the case. While this may have immediate economic benefits to waste generators in terms of reduced costs, it works against national and local government's waste reduction efforts, as increased cost is widely considered to be an important driver for waste reduction. This is recognised in the Waste Minimisation Act (2008) s. 25 (b), which explains the introduction of the waste levy is to "increase the cost of waste disposal to recognise that disposal imposes costs on the environment, society, and the economy"

#### 4.1.4 Cleanfill and 'managed fill' disposal market

In the MfE's 2002 "A Guide to the Management of Cleanfills", 'cleanfill' is defined as:

"Material that when buried will have no adverse effect on people or the environment. Cleanfill material includes virgin natural materials such as clay, soil and rock, and other inert materials such as concrete or brick that are free of:

- combustible, putrescible, degradable or leachable components
- hazardous substances
- products or materials derived from hazardous waste treatment, hazardous waste stabilisation or hazardous waste disposal practices
- materials that may present a risk to human or animal health such as medical and veterinary waste, asbestos or radioactive substances
- liquid waste."

In terms of the Auckland Air, Land and Water Plan, the deposition on land of materials that comply with the MfE's definition of 'cleanfill' is generally a permitted activity. 'Managed fill sites', that accept soil with low levels of contamination, are more rigorously controlled through the resource consent process.

There are a large number of cleanfills in the Auckland Region, but as a result of cleanfilling's status as a permitted activity, the exact number is impossible to determine. A 2005 survey by SKM identified at least 30 cleanfill sites in the region,<sup>13</sup>

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<sup>13</sup> SKM (2008) Waste Facilities Survey – Methodology and Summary of Results, unpublished, prepared for the Ministry for the Environment

based on information provided by the ARC. The survey also noted six 'managed fill sites', where low level contaminants could be discharged. Two of these sites were disposing of waste generated on-site from their own operations.

An analysis conducted for this report estimates that approximately 1,770,000 tonnes of material are disposed of annually at cleanfills and managed fills in the Auckland region. This estimate is presented and explained in Section 4.3.

Ownership in the cleanfill market is much more fragmented than in the waste market, with quarry owners, transport operators, and private developers all featuring in the data made available by Auckland Regional Council (although cleanfilling itself is a permitted activity, resource consents may be required for earthworks and sediment control). The only known involvement of the major waste operators in the cleanfill/managed fill is EnviroWaste's operations at the closed Greenmount and Rosedale landfill sites.

The cleanfill operations in the Auckland Region are in direct competition with the municipal landfills and resource recovery operators for disposal of the portion of the waste stream that complies with the MfE's definition of cleanfill<sup>14</sup>. A substantial proportion of this material is generated by construction and demolition activity. The SKM survey estimated the quantity of cleanfill disposed of in the Auckland region to be over two million tonnes per annum, greater than the quantity of waste being disposed of to the municipal landfills. The SKM estimate is based on per capita cleanfill disposal data collected by Christchurch City Council, as no data are collated on cleanfill tonnages in the Auckland Region.

The cost of entry into the cleanfill market is substantially lower than into the municipal landfill market. Cleanfills require much lower levels of engineering investment to prevent discharges into the environment and have very low, or negligible, compliance costs. Because of these differing cost structures, cleanfills charge markedly less for disposal than municipal landfills, often on the order of 10% of landfills' advertised gate charges.

Despite the differences in cost structures, municipal landfills often compete with cleanfills on the basis of price to retain flow control, as cleanfill tonnages are so large. As the marginal cost per tonne of landfilling is very low, a landfill could potentially still make a profit accepting cleanfill material at a price competitive with cleanfills' gate charges. This is particularly the case for the disposal of clean soil, which landfills can use for cover material or for site engineering purposes.

All of the landfills in the Auckland Region are required to cover exposed refuse each day to reduce odour and vermin problems and to reduce rainwater infiltration. The landfills are also required to cover cells that are not in use with thicker layers of soil than required for daily cover. For the most part, the landfills excavate cover material on-site. There is, however, a cost involved in on-site excavation of cover material, and any soil that can be sourced from off the site can be used to replace on-site cover material. For this reason, municipal landfills are often prepared to accept cleanfill at a much lower cost than municipal refuse.

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<sup>14</sup> In addition cleanfills are known to sometimes accept material that is outside the MfE definition of cleanfill – and so may compete for material that should technically be disposed of to a consented landfill. The extent of this activity is virtually impossible to quantify.

Cleanfills also compete with resource recovery operators for materials such as, for example, waste concrete. Resource recovery operators that process waste concrete into aggregate compete against the cost of cleanfill disposal to maintain flow control over their supply of material.

In environmental terms, the most important aspect of the competition between cleanfills and municipal landfills for flow control relates to the disposal of contaminated soils. Landfills are not able to use contaminated soils for engineering purposes as readily as they can clean soils, and gate charges for contaminated soils at landfills may be higher than for cleanfill materials. As there are no rigorous regulatory systems in place for the identification and tracking of materials from contaminated sites in the Auckland Region, the possibility exists for cleanfills to be used illegally for the disposal of contaminated soils as a cost-saving measure by the waste generator.

The July 2009 introduction of the waste levy has the potential to exacerbate this problem. Section 3 of the Waste Minimisation Act (2008) provides for a waste levy of \$10/tonne to be imposed on all wastes deposited in disposal facilities. This levy will only apply to waste disposed of at landfills accepting household waste, and not to waste disposed of at cleanfills. At the time of writing (July 2009), the Ministry for the Environment is still considering the types of materials to which the levy will ultimately apply. The 2009 MfE document, *Calculation and Payment of the Waste Disposal Levy - Guidance for Waste Disposal Facility Operators*, states:

“The situation regarding the use of discarded material for daily cover is complex, and the Ministry will provide a more complete assessment once policy work is complete.

The levy applies to material or waste that is disposed of or discarded at the facility. If soil or other material brought to a facility is not reused at the facility, for instance as cover material, it may in fact be disposed of at the facility, in which case it may be subject to the levy.”

If the levy is applied to contaminated soils and materials suitable for use as engineering materials or cover materials by landfills, this will increase considerably the cost of landfill disposal of these materials, and provide a greater incentive for their improper disposal at cleanfills.

#### 4.1.5 Recovered materials market

The recovered materials market is much more fragmented than the waste market. Unlike the waste market, in which the important divisions are ‘horizontal’ (collection, bulking, and disposal), the recycling industry is divided into distinct markets according to material types – paper/cardboard, glass, metal, and plastics. The major local processors of the different material types tend to have a dominant position in each marketplace.

Also unlike the waste market, the recovered materials market is integrated with an international market. As virtually all waste generated in the Auckland region is disposed of locally, the only competition for disposal is between the landfill operators. Many local collectors and processors of recovered materials are, on the other hand,

able to enter the international secondary materials market for sale of their materials. While low-volume, high-value materials such as metals and plastics have been exported for many years, the increase in the secondary materials market (up until the global financial crisis of August 2008) resulted more recently in high-volume, lower-value materials such as paper and glass being exported as well.

Although much of the data relating to recovered materials is considered commercially sensitive by the organisations involved, data gathered for this project indicate that approximately 247,000 tonnes of recyclable commodities are recovered annually. These data are presented in Section 4.4.

Glass is the clearest example of this, with Owens-Illinois (NZ) Ltd (O-I) being the only significant local processor of glass. O-I (formerly ACI Glass Packaging), at its plant in Penrose is the only manufacturer of glass bottles and jars in New Zealand. The manufacturing process uses a proportion of culled (recycled glass) along with virgin material, and this process is the major user of recovered glass in the country. O-I does not collect glass from the consumer, but rather relies on a network of suppliers, most of which source post-consumer glass from domestic and commercial recycling services. Prior to manufacturing, the recovered glass is processed by Visy Recycling (NZ) Ltd at a plant adjacent to the O-I plant.

O-I's dominance in the market lessened somewhat in the last decade when it substantially reduced the price paid for cullet. Whereas previously it had been economically viable for glass to be shipped to Auckland from throughout the country, the price reduction has resulted in glass being stockpiled, or alternative uses for it sought, in many parts of the country. It is understood that some cullet is now being exported to Australia.

Recovered glass is also used in the manufacture of glasswool insulation by Tasman Insulation NZ Ltd at its Penrose factory. The glass used is pre-consumer pane rather than bottle glass.

Although its market position is not as dominant as O-I's, Carter Holt Harvey (CHH) is the only company manufacturing paper and cardboard packaging from recovered materials in New Zealand. CHH has two plants using recovered materials in New Zealand, at Te Papapa, Auckland and in Kinleith. Source material for the plants is recovered from both pre-and post-consumer sources.

CHH is more vertically-integrated than O-I, with its Fullcircle Recycling division being one of the major players in the commercial paper recycling collection market, partially under the Paper Chain and Paperchase brands. However, because there are offshore markets for recovered paper and cardboard, other collectors have become established without needing to rely totally on CHH for product sales. Paper Reclaim Ltd is one of the major independent collectors and processors in the Auckland region, and while some of its recovered product is on-sold to CHH, a significant quantity is exported. Both of the major landfill operators, TPI and EnviroWaste, are also active in the collection and processing of paper products.

The recovered metals industry is more fragmented again than the paper recycling industry. The major participant in the recovered ferrous metal industry is Sims Pacific Metals Ltd, a joint venture between Sims Metal Industries, a subsidiary of Sims Group,

one of the largest metal recyclers in the world, and Fletcher Building. A significant proportion of the ferrous metal collected and processed by Sims Pacific is used at Fletcher's Pacific Steel plant in Otahuhu.

Both pre- and post-consumer metals are significant sources of material for the scrap metal industry. Because of the relatively high value and low volume of metals, particularly non-ferrous metals, there are a large number of small participants in the scrap metal industry. These small scrap metal collectors and processors collect from industry or operate scrap metal yards open to the public. While some may on sell to larger local organisations, others bale and export their processed product.

The plastics recycling industry is perhaps the least well-established of the commodity recycling industries. The low cost of plastics was a major economic disincentive to the industry until the rise in the cost of petrochemicals in the last decades. A significant proportion of the industry is business to business recycling of pre-consumer materials, in which the recycler will re-granulate off-specification product and return it to the manufacturer for re-use (tolling). Recycling of this kind is relatively expensive to set up, requiring sophisticated technology to maintain quality standards. Astron Plastics is one of the more prominent of many participants in this marketplace.

As recycled plastics processing is less tolerant of contamination than the other materials, post-consumer recycling has been one of the more difficult markets to become established. Much of the industry resulted from the introduction of kerbside recycling by local councils, which created a supply of materials that had not previously been collected. The collection of other post-consumer plastics, often commingled with other materials, became more common after kerbside recycling became entrenched. All of the major waste companies as well as many other smaller participants now collect and process post-consumer plastics and other materials.

As sophisticated processing technology is not required for small operations, there are a number of small sorting lines in the Auckland region separating plastics and other materials. These include facilities owned by Rubbish Direct, Paper Reclaim, and TPI Allbrite. The market for commingled recyclables, however, is dominated by Visy Recycling (NZ) Ltd at its Onehunga plant, operated under contract to Auckland and Manukau City Councils, which are also financial partners.

While most of the recovered materials market is structured around individual commodities, the construction and demolition recovery market is based around collecting and processing all wastes from a single industry. The C&D waste processing industry is relatively new, and has entered the marketplace as a direct response to rises in landfill charges. A C&D processing site is able to divert about 80%, by weight, of all incoming waste by separating cleanfill-type materials for cleanfill disposal and recoverable materials, such as concrete, for processing.

TPI has operated two of its transfer stations (Rosedale and Hobill Avenue) as C&D sorting facilities for a number of years. Two major C&D sorting operations have also been opened recently, by Nikau Contractors Ltd and Ward Resource Recovery Ltd.

Other recovery options for materials associated with construction and demolition include Envirofert Ltd's 'land storage' of plasterboard at its Tuakau facility, and Reharvested Timber Products Ltd timber processing facility. The timber processing

facility produces various grades of mulch from both treated and untreated timber for a variety of purposes.

Wood waste is also used for fuel by several timber processors in the region, including Fletcher Building's Laminex plant in Kumeu and Pinepac's sawmills in Kumeu and Whenuapai. Post-consumer wood waste is used for fuel by Waste Energy Burners Ltd in Onehunga.

#### 4.1.6 Organic waste collection and processing market

Some segments of the organic waste collection and processing market are very well developed, while others are just beginning to emerge. An estimate made for this report concludes that 192,000 tonnes of organic waste are diverted from landfill disposal annually. This estimate is presented in Section 4.4.

The most developed segment of the market is the collection and rendering of pre-consumer meat and seafood waste. Most of the waste is sourced from pre-consumer activity, such as supermarkets and processing operations. The main participant in this market is Waikato By Products Ltd, a subsidiary of Lowe Corporation Ltd.

The collection of pre-consumer food waste for use as stock feed is well-established, but until recently has most commonly been done by the farmers, particularly pig farmers, themselves. Most of this market is sourced from supermarkets and food manufacturers. In recent years, this market has become more centralised, with Eco Stock Supplies Ltd now controlling a substantial segment of the market.

The collection and processing of post-consumer food waste, such as that generated by households, restaurants, and hotels, is in the early development stage. The main barrier to this has been the lack of a consented facility in the Auckland region. While obtaining the necessary resource consents for processing pre-consumer food waste has been relatively straightforward, the consent process for processing post-consumer food waste has proven difficult.

As of writing (July 2009), only a single processor serving the region, Envirofert Ltd near Tuakau, has the necessary consents, and these are only for a trial at the company's greenwaste processing operation. It is understood that commercial food waste collections have recently begun to provide material for the operation.

An organic processing operation in Northland, Sustainable Waste Management Ltd near Ruakaka, is also consented to compost food wastes, but mostly processes noxious wastes, such as septage, from the Auckland region, and under existing consents would not have sufficient capacity to process the quantities of food wastes likely to be involved.

The territorial authorities in the Auckland region are, as a group, currently investigating the feasibility of establishing kerbside food waste collections for residents.

Compared to the food waste market, the collection and processing of greenwaste is very well developed. There is an extensive infrastructure of collection facilities at most

transfer stations in the Region, and commercial collections are available for households and businesses.

The barriers to establishing greenwaste processing operations include the relatively low cost of landfill disposal, against which greenwaste recovery competes, the difficulties in establishing markets for the compost products, and the resource consent process. Currently, the greenwaste processing market is dominated by Living Earth Ltd, which is half-owned by TPI. Living Earth's main processing facility, which uses open windrowing technology, recently moved from Pikes Point in Onehunga to Puketutu Island, in Manukau City. A large-scale vertical composting unit system at Waitakere Refuse and Recycling Station, which opened in 2001, closed in 2008.

Several smaller operators also process greenwaste, including Heards in Papakura, which shreds and composts greenwaste and other organic materials on-site, and Silverdale and Warkworth transfer stations, which shred greenwaste. Commercial-scale vermi-composting units are also available, and have had limited uptake by businesses.

A significant proportion of the greenwaste market does not involve established disposal or processing facilities. Some large generators of greenwaste, such as arborists, mulch waste on-site and dispose of it immediately as mulch.

Large-scale composting of biosolids and other noxious wastes does not yet occur in the Auckland region. As a result, significant waste streams, such as the biosolids produced by the North Shore wastewater treatment plant are disposed of to landfill. A Hot Rot horizontal composting unit that had been processing biosolids from the Army Bay wastewater treatment plant in Rodney District ceased operation in 2007. Sustainable Waste Management's Ruakaka facility composts some noxious wastes from the Auckland region, such as septage from Waitakere City. Other smaller-scale operations are likely to be in operation also, processing waste from individual industries.

#### 4.1.7 Hazardous waste collection and processing market

The 'hazardous waste market' comprises both liquid and solid wastes that, in general, require further treatment before conventional disposal methods can be used. The most common types of hazardous wastes include:

- Organic liquids, such as those removed from septic tanks and industrial cesspits
- Solvents and oils, particularly those containing volatile organic compounds
- Hydrocarbon-containing wastes, such as inks, glues, and greases
- Contaminated soils (lightly contaminated soils may not require treatment prior to landfill disposal)
- Chemical wastes, such as pesticides and agricultural chemicals
- Medical and quarantine wastes

- Wastes containing heavy metals, such as timber preservatives
- Contaminated packaging associated with these wastes
- Batteries (both wet cell and dry cell)
- LPG and other gas cylinders
- Fluorescent tubes.

Auckland territorial authorities and the Regional Council provide important hazardous collection services for household hazardous waste through Hazmobile. Agricultural Chemical (AgChem) collection is also provided by council.

A range of treatment processes are used before hazardous wastes can be safely disposed of. Most disposal is either to landfill or through the trade waste system. Some of these treatments result in trans-media effects, with liquid wastes being disposed of as solids after treatment. A very small proportion of hazardous wastes are 'intractable', and need exporting for treatment. These include polychlorinated biphenyls, pesticides, and persistent organic pollutants.

The number of participants in the hazardous waste market is relatively small. In recent years, both TPI and EnviroWaste have acquired existing businesses to establish a greater presence in the market. EnviroWaste purchased Chemwaste Industries Ltd in 2007, and now operates it as a division of its Technical Services subsidiary. In 2005, TPI purchased Nuplex Industries Ltd Environmental Services group and then purchased Medismart Ltd in 2007. Also in 2007, TPI purchased the non-medical waste business of Medi-Chem Waste Services Ltd.

The other major participant is Medi-Chem Waste Services Ltd. An associated company, International Waste Ltd, operates the steam sterilisation unit at Auckland airport, which treats much of the quarantine and medical sharps waste from the region.

## 4.2 Role of local government in regional waste market

### 4.2.1 Territorial authorities

Although territorial authorities (TAs) in the Auckland region do not control strategic waste infrastructure assets to the same extent as councils elsewhere in New Zealand, the councils still play a major role in the regional waste market. This role is due largely to the magnitude of the waste and recycling contracts controlled by local government, the councils' role as a regulator, and the statutory obligations placed upon the councils by the Waste Minimisation Act.

The combined waste streams controlled by the TAs of the Auckland region comprise approximately 20% of the overall waste disposed of to landfill, making TAs by far the single largest 'generator' of waste. The individual contracts let by TAs for kerbside refuse collection and disposal are amongst the largest individual waste contracts in the

region, with the Manukau City Council kerbside refuse contract, totalling 64,000 tonnes per annum likely to be the largest single contract in the region (the Auckland City kerbside refuse collection is split into separate contracts).

The terms of these contracts has grown longer over time, with seven to ten year contract periods becoming the norm. Longer contracts allow the contractor to pay off the expensive capital equipment required over a longer period of time, in theory resulting in lower costs to council.

TA refuse and recycling contracts are, as a result, of great importance to many of the major private waste operators. For new entrants to the Auckland market, these contracts are often sought as an entry point into the market, allowing a company to establish in the region with a single, substantial contract and to then increase their market share from that point. Some operators are totally reliant upon council business, and these operators would not be able to operate if these contracts were lost.

For the major waste operators that own landfills, TPI and EnviroWaste, the TA collection contracts are not essential, although they still tender competitively for them. These large operators rely primarily on their commercial collections and landfill operations to remain profitable.

The regulatory role of the Auckland TAs has increased significantly in the last decade. Most of the councils now have bylaws in place to regulate and control the setting out, collection, transportation, and disposal of refuse. The bylaws aim to protect public health and amenities, minimise traffic disruption, and encourage waste minimisation.

The more recent waste bylaws include provision for the licensing of waste collectors, and the three TAs to the north of the region, Rodney District, North Shore City, and Waitakere City have adopted a common bylaw that requires licensed collectors to report regularly on the quantities and types of waste collected from each region. In August 2009 Franklin District Council also adopted a solid waste bylaw that is very similar to the North Shore, Rodney and Waitakere bylaws, although under the new Franklin bylaw licensing will not be required until February 2010.

The statutory obligations placed on TAs by the Waste Minimisation Act (2008) and its predecessor, the Local Government Amendment (1996) Act require TAs to become actively involved in the waste market by planning and implementing waste reduction initiatives. Through major initiatives such as kerbside recycling, TAs have developed significant services and infrastructure assets that would otherwise not have been 'commercially viable'. These initiatives have, in turn, also strengthened the overall recycling industry, by providing a 'critical mass' of recovered materials that otherwise might not have been available.

The other main type of initiative for waste reduction undertaken by TAs is in the education and promotional area. The larger TAs employ staff directly in this field. In the smaller councils, the educational role is generally included in that of the relevant council officer.

#### 4.2.2 TA joint initiatives

There has been a trend over the last decade for the Auckland region TAs to work as a group on waste issues, rather than as individual councils. Some of the initiatives undertaken as partnerships between the TAs include:

- Shared kerbside refuse and recycling contracts between North Shore City and Waitakere City Council
- Manukau and Auckland City's joint venture with Visy Recycling to establish the materials recovery facility in Onehunga for the processing of kerbside recyclables from both cities.
- Rodney, Waitakere, and North Shore adopting a standardised waste bylaw, including operator licensing and waste data gathering
- All of the TAs meet regularly through the Auckland Waste Officers Forum. The Forum has initiated many region-wide projects, including investigations into the feasibility of councils providing kerbside food waste collection and processing and the development of a regional waste strategy.
- The HazMobile is a mobile hazardous waste collection service. The Auckland HazMobile is co-ordinated by Auckland Regional Council, and provided in conjunction with Auckland City Council, North Shore City Council, Manukau City Council, Franklin District Council, Papakura District Council, and Rodney District Council.
- Be a Tidy Kiwi anti-litter campaign. All of the TAs ran a three-year campaign to encourage residents to take personal responsibility for littering.
- Create your own Eden – All of the TAs (except Waitakere) participated in this programme to promote home composting.
- WasteWise Schools is an Education for Sustainability programme that assists schools to reduce their waste. WasteWise Schools is supported by all of the TAs and the ARC.
- All of the TAs and ARC sponsored the EnviroSmart programme in the Auckland region, a nationwide programme that provided businesses with the tools to adopt an accredited environmental management system.
- The Auckland Sustainability Framework project is a partnership between all of the TAs and the ARC. The project is also in collaboration with central government agencies coordinated through the Government Urban and Economic Development Office (GUEDO). The Framework has identified climate change, natural resource use, global economic change, population growth and demographic and social change as the sustainability challenges for the region and set eight goals to address these challenges. These goals have informed the content and direction of Auckland's Sustainability Plan: Keeping Auckland's Future Bright.

### 4.2.3 Role of regional council in regional waste market

#### **Historical legislative environment and Regional Council role**

In New Zealand, the modern era of waste management legislation began with the Health Act 1956, which ascribes to local authorities the duty to “promote and conserve the public health within its district”. As part of this duty, local authorities were required to provide sanitary works, including sewerage works, waterworks, swimming baths, cemeteries, sanitary conveniences for the use of the public, and “works for the collection and disposal of refuse, nightsoil, and other offensive matter”.

The Auckland Regional Authority Act 1963 gave the ARA the right to undertake and operate new regional services in competition to other territorial local authorities, but not against private enterprise. At that time, the region was served by a large number of small, poor quality landfills owned by local councils, and there was legal doubt as to whether the “regional services” described in the Act related to refuse disposal.<sup>15</sup>

The government moved in the mid-1970s to shift the responsibility for refuse disposal in the Auckland region from local to regional level. A 1976 Order in Council transferred to the Auckland Regional Authority the refuse disposal function of every local council within the Auckland regional district.<sup>16</sup> The Order in Council specifically excluded the Regional Authority from undertaking refuse collection, with that responsibility to remain with the constituent local authorities within the region.<sup>17</sup> The collection of solid wastes remained a discretionary function for councils, but the requirements of the Health Act resulted in all eleven local authorities in the Auckland region providing a regular refuse collection.

In the same year, the ARA produced its Refuse Disposal Bylaw, which further increased its involvement in the waste disposal field. This Bylaw prohibited the provision or operation of any facility for the disposal of refuse without the consent of the Authority. As well, the Bylaw prohibited any person from disposing of any refuse other than clean fill except in a facility provided or authorised by the Authority.

The ARA’s most important involvement in waste disposal came in 1978, when the Authority opened the Rosedale Rd Landfill in the North Shore, and in 1980, when it opened Greenmount Landfill, in East Tamaki.

The role of local councils remained constant during this period, until the Local Government Amendment Act 1979 inserted provisions relating to refuse collection and disposal that had been absent in the original Local Government Act 1974. Territorial authorities were now permitted, but not required, to provide for the collection and disposal of refuse, with the work being executed either by contract or by the territorial authority. The territorial authorities were permitted to construct and operate refuse disposal works and to enact bylaws regulating the collection and disposal of refuse. Suitable methods for refuse disposal were deemed to be “by deposit on land, by

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<sup>15</sup> Auckland Regional Council (1990) Report of the Refuse Working Party on the Provision of Refuse Disposal Services by the Auckland Regional Council, Auckland Regional Council, Auckland, pp. 3-1 - 4-3

<sup>16</sup> Auckland Regional Authority (1987). Auckland Region Refuse Strategy Discussion Document, Auckland Regional Authority, Auckland, pp. 1-3

<sup>17</sup> ARA Refuse Department (1988). Integrated Refuse Disposal Strategy for Auckland Region, Auckland Regional Authority, Auckland, pp. 1-5

composting, incineration, pulverisation, shredding, compacting” or other means. Recycling was included in legislation for the first time as the “separation or extraction or conversion into a useful marketable product” were allowed as a means of disposal.

Further responsibilities for local authorities were enacted when the Litter Act 1979 made better provision for the abatement and control of litter. Under the Act, every public authority was required to provide suitable litter receptacles in every public place where litter is likely to be deposited and to make provision for the emptying of the receptacles.

In 1988, the ARA adopted its Integrated Refuse Disposal Strategy.<sup>18</sup>

The Local Government Amendment (No 2) Act 1989 provided the framework for the transformation of the local government sector in New Zealand, reconfiguring a myriad of existing bodies into 13 regional councils and 76 territorial local authorities comprising city and district councils. The new regional councils were given wide responsibility for natural resource management, and the necessary powers of enforcement, by assuming the functions of the catchment boards, drainage boards, and other local bodies. The restructuring provided regional councils with policy-making functions while leaving the responsibility for service provision with the territorial local authorities.<sup>19</sup> The Order in Council conferred on the Auckland Regional Council the same residual powers with respect to refuse disposal as the ARA had had previously.

In 1990, a national waste management policy was announced by the Labour government of the day. The policy included a target to reduce solid waste production nationally to 20% below its 1988 levels.<sup>20</sup>

In November, 1991, the refuse disposal enterprise of the ARC (still operating Greenmount and Rosedale landfills) was transferred to Northern Disposal Systems, a local authority trading enterprise.

In 1992, the Government Waste Management Policy was released, which no longer included a waste reduction target. The policy aimed to ensure that waste generators should meet the costs of the waste they produce and to encourage the implementation of the waste management hierarchy. A national database for waste was established by the Department of Statistics, using the Waste Analysis Protocol, as part of the State of the Environment Reporting project. The “generator pays” principle included in the policy was meant to provide an incentive for waste generators to adopt less wasteful practices through an economic incentive.

In June 1995, Northern Disposal Systems joined with Fulton Hogan Limited, a contracting company with waste collection activities throughout the South Island, to form EnviroWaste Services Limited, a 50/50 joint venture company.

The 1996 Government Coalition Agreement outlined specific waste reduction policy initiatives and reinstated a target for the reduction of solid waste production to half the 1990 level by the year 2000.<sup>21</sup>

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<sup>18</sup> ARA Refuse Department, 1988. Integrated Refuse Disposal Strategy for Auckland Region, Auckland Regional Authority, Auckland, pp. 1-5

<sup>19</sup> McNeill, J, (1989) *ibid*

<sup>20</sup> Ministry for the Environment (MfE), 1997b. The State of New Zealand’s Environment, Ministry for the Environment, Wellington, pp. 3.37

The passing of the Local Government Amendment Act (No. 4) 1996 radically changed the responsibilities of territorial authorities. Territorial authorities were given the duty of encouraging efficient waste management while giving regard to environmental and economic costs and benefits as well as to the traditional function of maintaining public health. Every territorial authority was required to adopt a waste management plan making provision “for the collection and reduction, reuse, recycling, recovery, treatment, or disposal of waste in the district”. Appropriate powers were given to territorial authorities to perform these functions, including the use of economic incentives and disincentives to promote the objectives of its plan.

The passing of the Act transferred the responsibility for the future of waste management to territorial authorities and away from the regional councils. The Act revoked the powers given to the ARA by the 1976 Order in Council and the ARA’s Refuse Disposal Bylaw 1976. In November 2001, Northern Disposal Systems sold its 50% interest in EnviroWaste to Fulton Hogan Limited, ending the Auckland Regional Council’s involvement with waste infrastructure.

The current legislative environment affecting waste management is described in detail in Section 2.3z

### **Current Auckland Regional Council involvement**

Under the Resource Management Act 1991, regional councils do not have any specific waste management functions, other than those relating to managing the environmental effects of waste, particularly discharges.

Under the Act, the first Auckland Regional Policy Statement was put into place in 1999, and at time of writing (July 2009) is under review. The 1999 Policy Statement addressed waste management in an extensive manner, providing objectives and policies on waste minimisation, the environmental effects of waste management, integrated management, and waste disposal facilities. This Policy Statement formed the basis for the ARC’s reduced role in waste management for the next decade.

The discussion document released for the review of the Policy Statement states<sup>22</sup>:

“Given the comprehensive statutory changes, it is questionable whether the next ARPS needs to deal with waste management. The ARC has no waste management functions and the provisions of the New Zealand Waste Strategy and the upcoming Waste Minimisation Bill have overtaken most provisions of the previous ARPS. Nevertheless, there are real benefits to be gained from region-wide integration. If a two-tier system of local government continues in the Auckland region, then the ARPS could contain policies and methods supporting a regionally coordinated approach.”

The role of ARC in waste management in 2009 reflects the diminished functions given it by legislation. Currently, as well as its regulatory role relating to resource consents for the waste industry, Auckland Regional Council is involved in:

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<sup>21</sup> Boyle, C, 1999. Cleaner Production in New Zealand, *Journal of Cleaner Production* 7 (1999), pp. 59-67

<sup>22</sup>

<http://www.arc.govt.nz/albany/fms/main/Documents/Plans/Regional%20Policy%20and%20Plans/ARPS/ARPS%20Background%20Document%20Part%20A.pdf>

- The HazMobile mobile hazardous waste collection service
- Auckland Waste Officers Forum
- WasteWise Schools
- EnviroSmart
- The Auckland Sustainability Framework project
- Auckland Sustainable Cities Programme
- RENEW waste exchange network
- Big Clean Up (completed in 2008)
- Planned establishment of a region-wide used oil collection system.

#### 4.2.4 Private sector's view of local government's role in waste market

The Auckland Region is fortunate in that there is a processing or reuse option for a wide range of materials present in the region, and the waste management sector has a very strong presence. Recently a number of interviews were held with key players in the Auckland waste management industry to seek their views on the key issues facing the industry, and solutions to these. There were several issues which were common across most interviews and these are described below.

The companies interviewed were comfortable with the role most Councils have chosen in focusing on household waste. The private sector considers it is better suited to dealing with the waste streams produced by the commercial and business sectors, given that these are often very specific material types and in large quantities. The private sector is also comfortable with their role in responding to the needs of Councils for infrastructure or processing facilities. As long as they are given sufficient indication of Councils' strategic direction, the private sector believes they can respond to these needs with more innovative solutions than the Councils can working alone.

Without exception all waste management businesses confirmed that they had the ability to manage larger volumes of waste or recycling material. Working more closely with the Councils was mentioned frequently as a way of achieving these increases in volumes. The waste materials processing industry dislikes seeing material transported overseas which could have been processed here, but does anticipate they will be even less competitive on price in future with the introduction of the national Waste Levy. This is because on-shore operators will be required to pay the extra disposal costs for the reject portion of the material they accept. Some recycling businesses landfill around 10% of their incoming material stream.

Inevitably, there are businesses operating in the industry that are viewed as being less responsible and compliant with consents and regulations. All businesses spoken to would like to see Councils taking a strong role in setting and enforcing requirements for minimum practice. Although there have been issues in the past with licensing schemes in the region, this is also seen by the industry as a potential solution to this

problem as long as the burden of paperwork and reporting is minimised. A coordinated licensing scheme that is consistent across the region could benefit from strong support in the private sector who desire a level playing field and do not want to be in effect 'penalised' for responsible management. Construction and demolition waste in particular is seen as a waste stream that is vulnerable to poor management.

## 4.3 Inventory of waste facilities

### 4.3.1 Transfer & bulking facilities

A map of the location of the transfer stations in the Auckland Region is presented in Section 3.1.2 (Fig. 4) and a summary of these facilities is in Table 2.

### 4.3.2 Cleanfills and managed fill sites

Auckland is served by a range of facilities through the Region. A national survey of 'non municipal waste disposal sites' conducted on behalf of the Ministry for the Environment in 2008<sup>23</sup> identified 30 operational clean-fill facilities and 6 'Managed Fill' sites in the Auckland Region. Anecdotal evidence suggests that the number of clean fill sites is likely to be much greater than this but that many of these sites are small and are only open to accept material for a short period of time<sup>24</sup>.

The Auckland Regional Council holds records on 5 operating managed fill sites across the region at the time of writing of this report. There are also a large number of sites holding consents relating to cleanfill. A review of information on Consent files for a portion of the managed fills and cleanfills holding resource consent from the Auckland Regional Council were reviewed. Estimates can also be developed based on a the MfE 2008 survey of managed fills/cleanfills throughout New Zealand, with the results pro-rated for Auckland using population i.e. per capita basis. This provides a basis for developing the estimate of the quantity of material disposed of to these sites presented in Section 4.3.

### 4.3.3 Disposal facilities

The landfills currently serving the Auckland market are shown in Table 3 below and in the map in Section 4.1.2. Tonnage figures are discussed in greater detail in Section 4.2.

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<sup>23</sup> Sinclair Knight Mertz (2008), *Waste Facilities Survey*, report to Ministry for the Environment, Wellington

<sup>24</sup> Many cleanfill sites consist of depressions or gullies that farmers/landowners wish to fill in, or building sites needing ground profile increases before construction begins.

**Table 2:** Summary of Transfer Facilities in Auckland Region

| Name   | Owner                     | Waste Stream   | Location                             |
|--|---------------------------|--|--------------------------------------|
| Constellation Drive Refuse Transfer Station                      | EnviroWaste               | General waste, recyclables, and garden waste                                 | 4 Home Place, Mairangi Bay           |
| Devonport Transfer Station                                       | North Shore City Council  | General waste, recyclables, and garden waste                                 | 27 Lake Road, Devonport              |
| East Tamaki Transfer Station                                     | Waste Disposal Services   | General waste, recyclables, and garden waste                                 | 33 Neales Road, East Tamaki          |
| Helensville Transfer Station                                     | Rodney District Council   | General waste, recyclables, whiteware and garden waste                       | Mill Lane, Helensville               |
| Hobill Avenue Depot  | TPI                       | General waste (only from Transpacific Industries)                            | Hobill Avenue, Wiri                  |
| Papakura Transfer Station  | TPI                       | General waste, recyclables, and garden waste                                 | Inlet Road, Takanini                 |
| Pikes Point  | EnviroWaste               | General waste, recyclables, and garden waste                                 | Onehunga, Auckland City              |
| Patiki Road  | EnviroWaste               | General waste and recyclables  | Patiki Road, Avondale, Auckland City |
| Pukekohe Transfer Station  | EnviroWaste               | General waste, recyclables, and garden waste                                 | Nelson Street, Pukekohe              |
| Rosedale Transfer Station  | TPI                       | General waste (bulk), commercial greenwaste. Cleanfill is separated.         | Rosedale Road, North Shore           |
| Silverdale Transfer Station                                      | Metrowaste                | General waste, recyclables, garden waste and hazardous waste drop off.       | 101 Foundry Road, Silverdale         |
| Snells Beach Waste Transfer Station and Resource Recovery Centre | Mason Contractors         | General waste, recyclables, construction waste and hazardous waste drop off. | Lawrie Road, Snells Beach            |
| Waiheke Waste Transfer Station                                   | Auckland City Council     | General waste, recyclables, and garden waste                                 | Ostend Road, Waiheke Island          |
| Waitakere Refuse and Recycling Station                           | Waitakere City Council    | General waste, recyclables, and garden waste                                 | The Concourse, Henderson             |
| Waiuku Transfer Station  | Franklin District Council | General waste, recyclables, and garden waste                                 | Hosking Place, Waiuku                |
| Wellsford Waste Transfer Station and Resource Recovery Centre    | Mason Contractors         | General waste, recyclables, and construction waste                           | Rustybrook Road, Wellsford           |
| Wiri Transfer Station  | EnviroWaste               | General waste, recyclables, and garden waste                                 | 196 Wiri Station Road, Wiri          |

**Table 3** Landfills serving the Auckland Region.

| Name/owner        | Owner  | Location                     | Capacity & Estimated Operational life   |
|-------------------|--|------------------------------|---|
| Claris Landfill   | Auckland City Council                                  | Claris, Great Barrier Island | Accepting 613 tonnes per annum, consented until 2015, capacity 20 – 40 years <sup>a</sup>                             |
| Redvale Landfill  | TPI  | Dairy Flat, Rodney           | Annual tonnage commercially sensitive, consented until 2023   |
| Whitford Landfill | Waste Disposal Services (Manukau City Council and TPI) | Whiford, Manukau City        | Annual tonnage commercially sensitive, limited to 200,000 tonnes per annum by resource consents, consented until 2040 |
| Hampton Downs     | EnviroWaste  | Hampton Downs, North Waikato | Annual tonnage commercially sensitive. Consented to 2030, capacity to at least 2045 <sup>b</sup>                      |

## 4.4 Diverted materials

### 4.4.1 Transfer, bulking and processing

Many of the facilities listed in Section 3.3.1 are also available for the transfer of recyclable materials. Table 4 focuses more on key facilities specifically for transfer, bulking and processing of recyclables.

In some cases the material flows between the recovered material collectors, transfer/bulking points and processors is clear and measurable, but in many cases the information is not available. Material flows that can be quantified to a reasonable degree include:

- Glass: the vast majority of recyclable glass in the Auckland Region is eventually delivered to Owens-Illinois (NZ) Ltd in Penrose. The only current exception to this is glass fines that are too small and contaminated to go through the ACI plant, and alternative uses for these are currently under investigation such as base layer material for roading.
- Paper: CHH FullCircle used to receive the vast majority of recyclable paper in the Auckland Region. They have recently lost about 30,000 tonnes per annum of this material, largely to export markets.

<sup>25</sup> Auckland City Council internal assessment

<sup>26</sup> Hampton Downs Landfill does not have an annual limit on the amount of waste they can accept. As they are located in the Waikato Region, their consent is with Environment Waikato and the consent doesn't provide for a requirement to report on the amount of waste received from the Auckland Region.

- Green waste: Green waste disposed of at transfer stations, collected from businesses and households and generated by commercial landscape companies is handled by Living Earth, EnviroFert and Sustainable Waste Management.
- Steel: Scrap steel is either reprocessed by Pacific Steel Ltd or exported.

**Table 4** Diverted Materials Processing

| Name/owner                       | Key services/waste streams  | Location                                    |
|----------------------------------|---|---|
| Sims Pacific Metals              | Recycle scrap steel   | Otahuhu, Manukau City                       |
| Owens-Illinois (NZ ) Ltd         | Recycle glass   | Penrose, Auckland City                      |
| CHH Fullcircle                   | Recycle paper and cardboard   | Penrose, Auckland City                      |
| Living Earth                     | Compost garden waste  | Puketutu Island, Manukau City               |
| Ward Resource Recovery Ltd       | Reuse and recycle construction and demolition waste   | Onehunga, Auckland City                     |
| Nikau Contractors Ltd            | Reuse and recycle construction and demolition waste   | Church St, Penrose and Taniwha St, Meremere |
| Envirofert Ltd                   | Process organic waste through vermicomposting and windrow composting, and dispose of cleanfill waste  | Tuakau, North Waikato                       |
| Eco Stock Supplies               | Waste food from manufacturers and processors  | Wiri, Manukau                               |
| Sustainable Waste Management Ltd | Organic waste processing through enclosed windrow process including biosolids and organic processing wastes   | Ruakaka, Whangarei                          |
| Heard's Landscape Supplies       | Organic wastes, including greenwaste and demolition timber  | Boundary Road, Papakura                     |
| Reharvest Timber Products Ltd    | Waste wood  | Hunua Rd, Papakura                          |
| PVL Proteins                     | Fish and meat processing waste into fertiliser & tallow products  | Great South Rd, Penrose                     |
| Waikato By-Products              | Fish and meat processing waste into fertiliser& tallow products   | Lapwood Rd, Tuakau                          |
| JJ Laughton                      | Tyre shredding  | Glendene Waitakere City                     |
| Astron Plastics                  | Process pre-consumer plastic waste  | Neales Road, East Tamaki                    |
| Interwaste                       | Hazardous waste treatment & recycling (fluorescent tubes, dental amalgam, precious metals, quarantine, medical, pharmaceutical, secure waste, batteries and IT Equipment) | Auckland Airport                            |

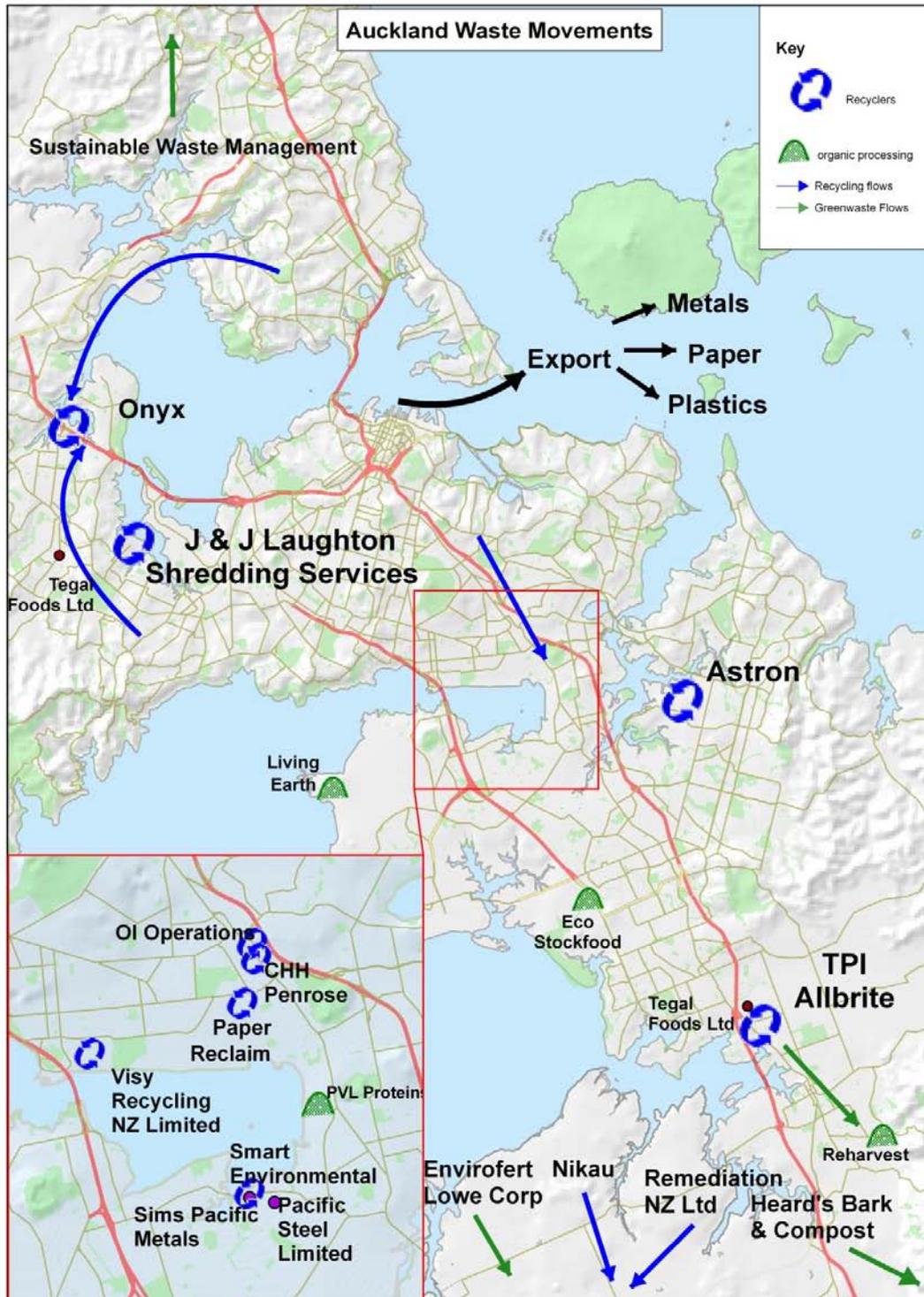
| Name/owner  | Key services/waste streams   | Location   |
|---|--|--|
| Smart Environmental   | Process mixed recyclables from their collections, and from various other facilities such as the Helensville Resource Recovery Centre.  | James Fletcher Dr, Favona                            |
| Visy (operated under contract to Auckland and Manukau City Councils, also financial partners) | Processes dry recyclables from Manukau and Auckland City Councils' kerbside collections. Also accepts mixed dry recyclables at the gate.   | Onehunga, Auckland City                              |
| Onyx Group Limited  | Processes dry recyclables from North Shore and Waitakere City Councils' kerbside collections.  | Waitakere Transfer Station, The Concourse, Henderson |
| Transpacific Allbrite Ltd   | Processes recyclables from Franklin DC and from commercial collections   | Takanini   |
| Remediation NZ Limited  | Processing a range of organic wastes through ermin-composting including some wastes from Auckland food/meat processors. Also processing paunch and drilling mud from other parts of New Zealand. | Ureti (Taranaki)                                     |
| CMA Recycling Ltd   | Scrap metal recyclers  | Onehunga, Auckland City                              |
| Paper Reclaim   | Collect, consolidate and on-sell paper, cardboard and other commodities (plastics, steel, aluminium, and glass)  | Penrose, Auckland City                               |

- Concrete: A number of demolition companies make use of on-site crushing equipment where job timing and space on site allow. Ward Demolition has a crushing operation in Onehunga for their own material that cannot be processed on demolition sites.
- 'Other' organic wastes: There are a number of processors of 'other' organic wastes (i.e. not green waste) in the Auckland Region. Options include rendering (PVL Proteins, Penrose and Lowe Corporation, Tuakau), stock food (Eco Stock Food), composting/ ermin composting (EnviroFert, Remediation NZ Ltd).

#### 4.5 Inventory of territorial authority waste and recovery service contracts

Territorial authorities are able to contract out the provision of various waste management services and all territorial authorities in the Auckland Region have done so, to a greater or lesser degree. Appendix B provides a complete inventory of contracts issued by each territorial authority, current contractors and expiry date. A summary of this information is presented in Table 5.

Figure 4 Key Processors of Diverted Materials



**Table 5** Inventory of Territorial Authority Waste Contracts

| SERVICE DESCRIPTION  | CONTRACTOR                             | EXPIRY DATE      |
|--|--|------------------|
| Auckland City Council  |  |                  |
| Kerbside refuse collection – East  | Enviroway Ltd                          | June 2011        |
| Kerbside refuse collection – Central   | Metropolitan Waste Ltd                 | June 2011        |
| Kerbside refuse collection – West  | Metropolitan Waste Ltd                 | June 2011        |
| Kerbside refuse disposal   | Transpacific Industries Group (NZ) Ltd | June 2011        |
| Kerbside recycling collection  | Thiess Services NZ Ltd                 | June 2015        |
| Kerbside recycling processing  | Visy Recycling (NZ) Ltd                | June 2022        |
| Inorganic refuse collection  | Alpha Refuse Collections Ltd           | Expired for 2009 |
| Waiheke Island collection etc.   | Transpacific Industries Group (NZ) Ltd | June 2019        |
| Franklin District Council  |  |                  |
| Kerbside refuse collection – bags  | EnviroWaste Services Ltd               | March 2010       |
| Kerbside refuse collection – Tuakau bins   | Envirowaste Services Ltd               | March 2010       |
| Kerbside recycling collection  | Transpacific Allbrite Ltd              | March 2010       |
| Kerbside recycling processing  | Transpacific Allbrite Ltd              | March 2010       |
| Waiuku transfer station operation  | Waiuku Recycling Ltd.                  | December 2010    |
| Manukau City Council   |  |                  |
| Kerbside refuse collections  | Alpha Refuse Collections Ltd           | June 2012        |
| Kerbside refuse disposal   | Waste Disposal Services                | None             |
| Kerbside recycling collection  | Enviroway Ltd                          | June 2015        |
| Kerbside recycling processing  | Visy Recycling (NZ) Ltd                | June 2022        |
| Inorganic refuse collection  | Alpha Refuse Collections Ltd           | December 2012    |
| Operation of East Tamaki transfer station and Whitford Landfill (owned by Waste Disposal Services, a joint venture between Manukau City Council and Transpacific Industries Group (NZ) Ltd.) | Waste Disposal Services                | None             |
| North Shore City Council   |  |                  |
| Kerbside refuse collection   | Onyx Group Ltd                         | June 2015        |

|                           |                                       |  |             |
|---------------------------|---------------------------------------|--|-------------|
|                           | Kerbside refuse disposal              | Transpacific Industries Group (NZ) Ltd | June 2015   |
|                           | Kerbside recycling collection         | Onyx Group Ltd                         | June 2015   |
|                           | Kerbside recycling processing         | Onyx Group Ltd                         | June 2015   |
|                           | Inorganic refuse collection           | Onyx Group Ltd                         | June 2015   |
| Papakura District Council |                                       |  |             |
|                           | Kerbside refuse collection            | Waste Management                       | June 2010   |
|                           | Kerbside recycling collection         | Smart Environmental Ltd                | August 2010 |
|                           | Kerbside recycling processing         | Smart Environmental Ltd                | No contract |
|                           | Inorganic refuse collection           | Annual contracts only                  |             |
| Rodney District Council   |                                       |  |             |
|                           | Kerbside refuse collection            | None – private operators only          |             |
|                           | Kerbside recycling collection         | Smart Environmental Ltd                | June 2013   |
| Waitakere City Council    |                                       |  |             |
|                           | Kerbside refuse collection            | Onyx Group Ltd                         | June 2015   |
|                           | Kerbside recycling collection         | Onyx Group Ltd                         | June 2015   |
|                           | Kerbside recycling processing         | Onyx Group Ltd                         | June 2015   |
|                           | Inorganic refuse collection           | Onyx Group Ltd                         | June 2015   |
|                           | Waste transport from transfer station | Smith & Davies                         | 2011        |
|                           | Waste disposal from transfer station  | Transpacific Industries Group (NZ) Ltd | 2014        |

## 5 Evaluation of current waste and diverted materials generation

As noted previously in this report data on waste disposal and diversion is of mixed quality. The data presented in this section has been compiled based on information provided by the Auckland Regional Council, territorial authorities, and from discussion with a range of disposal and processing companies. The figures should be treated as informed estimates rather than definitive.

### 5.1 Council-controlled waste and recycling streams

All of the territorial authorities in the Auckland region, with the exception of Rodney District, provide kerbside refuse and recycling collections for their residents. Rodney District provides a kerbside recycling collection, but not a kerbside refuse collection. Private waste operators also offer kerbside refuse collections in all areas. The proportion of households that uses private services varies between the councils. Factors may include the type of service and charging mechanism used by the local council and the cost of the services offered by the private operators.

There is no region-wide uniformity between the services, with different councils using wheeled bins and/or bags for refuse and wheeled bins or crates for recycling. Each of the councils also provides a range of other waste related services, including:

- Public place litter bins
- Loose litter collection
- Public place recycling bins
- Collection of illegal dumping
- Street sweeping
- Roadside cesspit cleaning
- Distinct refuse and recycling services for shopping areas and business districts.

A summary of each council's refuse and recycling services, including tonnage data for the major services and estimates of the councils' market share, is provided in Appendix B. A summary of the tonnage and composition data on domestic kerbside refuse and recycling collections is given in the following sections.

### 5.1.1 Tonnage of domestic kerbside refuse collections – council and private

The term 'domestic kerbside refuse collections' is used in this section to refer primarily to the kerbside refuse collections offered by councils or private waste operators to householders and small businesses. While most of the councils also provide separate collection services to business districts, which are not classed as 'domestic kerbside refuse', a small proportion of businesses in areas not served by the business district collections use the 'domestic' kerbside collections. As the collections all use either bags or wheelie bins, the volume of waste that can be set out by each user is not large, so these collections are only used by smaller businesses.

In most instances, it is not possible to separate purely 'domestic' (i.e. household) refuse tonnages from 'business' tonnages, so the 'business' waste is included in the figures for 'domestic refuse'. While the figure varies between councils, a general estimate is that 5% of 'domestic refuse' is generated by businesses, not households.

To estimate the annual tonnage of domestic kerbside refuse collected in the Auckland region, it is necessary to make certain assumptions. These are:

- The quantity of refuse collected by private waste operators. North Shore, Waitakere, and Rodney, through their waste operator licensing system, collect data on private domestic refuse collections, but for the other councils no data are available on private waste operators. For the other councils, tonnages are estimated based on council's individual estimates of the proportion of households using the council's service, converted to a council's market share, by weight.

It should be noted that for Rodney District, the dataset supplied by private operators under licensing conditions is incomplete, and therefore the domestic waste tonnage figure presented here is based on 2005 SWAP surveys. This has been adjusted based on a 4% population increase between 2005 and 2009.

- The proportion of refuse collected by the councils' kerbside refuse collections that originates from commercial premises. While most of the councils have separate commercial collections, for which data are recorded separately, some commercial premises in all areas use the domestic collection. For the purposes of the following calculations all waste collected via the council domestic kerbside refuse collections is considered to be 'domestic'.

It is estimated that a total of over 230,000 tonnes of domestic kerbside refuse are collected in the Auckland region each year (Table 6). This equates to 161 kg per capita per annum, which is comparable to other territorial authorities measured by Waste Not Consulting.

**Table 6** Domestic Waste Tonnage for the Auckland Region

|                                 | Rodney District | North Shore City | Waitakere City | Auckland City | Manukau City | Papakura District | Franklin District | Overall   |
|---------------------------------|-----------------|------------------|----------------|---------------|--------------|-------------------|-------------------|-----------|
| Population *                    | 96,400          | 223,000          | 201,300        | 438,100       | 361,900      | 48,300            | 63,200            | 1,432,200 |
| Council collection - tonnes     | 0               | 20,000           | 23,000         | 74,000        | 64,000       | 5,982             | 5,630             | 192,611   |
| Council market share – % by wt. | 0%              | 66%              | 91%            | 98%           | 95%          | 80%               | 67%               | 84%       |
| Private operator – tonnes       | 15,649          | 10,500           | 2,390          | 1,480         | 3,200        | 1238              | 2,815             | 37,271    |
| Total- tonnes                   | 15,649          | 30,500           | 25,390         | 75,480        | 67,200       | 7,178             | 8,445             | 229,843   |
| Kg/capita/annum                 | 162             | 137              | 126            | 172           | 186          | 149               | 134               | 160       |

Note: Where data has not been based on actual measurements available estimates are used..

### 5.1.2 Composition of council domestic kerbside refuse collections

The tonnage and composition of the domestic kerbside refuse collected by each of the individual councils is provided in Appendix B. By combining the tonnage and SWAP composition audit information from all of the councils, the data on total annual tonnage and composition can be calculated. The estimated composition of domestic refuse is presented in Table 7.

An estimated 193,000 tonnes of domestic kerbside refuse was collected by the councils of the Auckland region in the year to June 2008. This figure does not include the estimated 37,000 tonnes collected by private waste operators. Over half of the kerbside refuse (over 100,000 tonnes) was putrescible material, with the bulk of this being food waste. The second largest component of the kerbside refuse was material classified as 'Nappies & sanitary'. As well as disposable nappies, this classification includes paper towels, tissues, and feminine hygiene products.

<sup>27</sup> Statistics NZ estimate for 2008

**Table 7** Domestic Waste Composition

| Waste                 | Tonnes/annum | % of total |
|-----------------------|--------------|------------|
| Paper                 | 21,835       | 11.3%      |
| Plastics              | 22,209       | 11.5%      |
| Putrescibles          | 100,730      | 52.2%      |
| Ferrous metals        | 3,275        | 1.7%       |
| Non-ferrous metals    | 1,784        | 0.9%       |
| Glass                 | 3,988        | 2.1%       |
| Textiles              | 7,556        | 3.9%       |
| Nappies & sanitary    | 24,112       | 12.5%      |
| Rubble                | 3,272        | 1.7%       |
| Timber                | 1,671        | 0.9%       |
| Rubber                | 582          | 0.3%       |
| Potentially hazardous | 1,807        | 0.9%       |
| TOTAL                 | 192,822      | 100.0%     |

Note: Where data has not been based on actual measurements available estimates are used.

### 5.1.3 Tonnage and composition of council kerbside recycling collections

The tonnage and composition of the kerbside recycling (Table 8) collected by each of the individual councils is provided in Appendix B. This information is provided to the councils by the processor of the material. By combining the information from all of the councils, the data on total annual tonnage and composition can be calculated. For the calculation, it has been assumed that the councils that reported no contamination had an average contamination rate of 4%, similar to that for the councils that did report contamination.

**Table 8** Domestic Kerbside Recycling Quantities for the Auckland Region

| Material          | T/annum | % of total |
|-------------------|---------|------------|
| HDPE              | 1,910   | 1.5%       |
| PET               | 2,216   | 1.7%       |
| Mixed plastic     | 2,838   | 2.2%       |
| Subtotal plastics | 6,980   | 5.5%       |
| Aluminium cans    | 566     | 0.4%       |
| Steel cans        | 3,207   | 2.5%       |
| Paper/cardboard   | 60,410  | 47.7%      |
| Glass             | 50,268  | 39.7%      |
| Contamination     | 5,270   | 4.2%       |
| Total             | 126,701 | 100.0%     |

Over 120,000 tonnes of recyclable material are collected by the councils' kerbside recycling services. Nearly half of this is paper and cardboard, with glass accounting for a further 40%.

## 5.2 Tonnage and composition of waste to landfill

It is not possible to calculate, with any degree of precision, up-to-date tonnage and composition information related to waste being disposed of to landfill from the Auckland region. The reasons for this include:

- Only an aggregated tonnage for waste disposed of to landfills within the Auckland Region is released by the Auckland Regional Council. Tonnage figures are supplied to the Regional Council as a condition of the Redvale, Claris, and Whitford landfills' resource consents. This aggregated figure comprises solely the aggregated tonnage of waste disposed of at Redvale, Whitford, and Claris Landfills (to protect the commercial sensitivity of the information), and does not differentiate between waste originating from within the Auckland Region and that which is transported into the Region.
- Hampton Downs Landfill accepts waste from both Auckland and Waikato Regions. Their resource consent conditions do not require tonnage data to be supplied to Environment Waikato. For this project, Envirowaste Services Ltd has supplied a tonnage figure of waste disposed of at Hampton Downs Landfill from the Auckland Region.
- Composition data for Redvale and Whitford Landfills are collected regularly as a condition of the landfills' resource consents, and, as such, are in the public domain. Redvale conducts SWAP audits every three years, with the most recent being in 2006. Whitford has, until the most recent audit in 2006, been required to provide composition information every three years. That condition of Whitford's resource consent has been altered, and SWAP audits are now required every five years. No tonnage data are provided with the SWAP audits, only the composition in terms of proportions of the primary classifications of the SWAP.
- Hampton Downs is not required to provide composition data to Environment Waikato as part of its resource consent conditions and so, if any is collected, it is not in the public domain and has not been made available for this report.
- While both tonnage and composition data from Claris Landfill are in the public domain, the most recent composition data are from 2002. In the regional context, the tonnage of waste disposed of at Claris Landfill (about 650 tonnes per year<sup>28</sup>) is not significant, and Claris Landfill is not included in the following calculations.

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<sup>28</sup> [http://0-www.aucklandcity.govt.nz.www.elgar.govt.nz/council/members/councilmeetings/20060727\\_1900/CNCL-2707-agd-%2308b.pdf](http://0-www.aucklandcity.govt.nz.www.elgar.govt.nz/council/members/councilmeetings/20060727_1900/CNCL-2707-agd-%2308b.pdf)

Working within these limitations, the tonnage and composition of waste being disposed of to landfill from the Auckland region for the period 2007-2008 has been calculated as shown below.

| Whitford Landfill   |  |   |            |       |       |          |       |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |      |       |      |
|---|--|---|------------|-------|-------|----------|-------|--------------|-------|----------------|------|--------------------|------|-------|------|----------|------|--------------------|------|-------------------|------|--------|-------|--------|------|-----------------------|------|-------|------|
| Tonnage   | For the purposes of these calculations, it is assumed that Whitford Landfill is operating at the maximum rate permitted by its resource consents – 200,000 tonnes per annum.   |   |            |       |       |          |       |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |      |       |      |
| Composition   | <p>The composition of waste disposed of at Whitford Landfill is assumed to be that determined by the SWAP audit undertaken at the facility in 2006 by Waste Not Consulting. As the composition is reported to ARC as part of the facility's resource consent conditions, the results are in the public domain. The composition is given below.</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Composition of overall waste to Whitford Landfill 2005 – 2006</th> <th>% of total</th> </tr> </thead> <tbody> <tr><td>Paper</td><td>17.2%</td></tr> <tr><td>Plastics</td><td>15.3%</td></tr> <tr><td>Putrescibles</td><td>29.3%</td></tr> <tr><td>Ferrous metals</td><td>4.7%</td></tr> <tr><td>Non-ferrous metals</td><td>0.6%</td></tr> <tr><td>Glass</td><td>3.4%</td></tr> <tr><td>Textiles</td><td>4.0%</td></tr> <tr><td>Nappies &amp; sanitary</td><td>5.6%</td></tr> <tr><td>Rubble &amp; concrete</td><td>5.0%</td></tr> <tr><td>Timber</td><td>12.6%</td></tr> <tr><td>Rubber</td><td>0.4%</td></tr> <tr><td>Potentially hazardous</td><td>1.9%</td></tr> <tr><td>TOTAL</td><td>100%</td></tr> </tbody> </table> <p>Note: Where data has not been based on actual measurements available estimates are used.</p> | Composition of overall waste to Whitford Landfill 2005 – 2006 | % of total | Paper | 17.2% | Plastics | 15.3% | Putrescibles | 29.3% | Ferrous metals | 4.7% | Non-ferrous metals | 0.6% | Glass | 3.4% | Textiles | 4.0% | Nappies & sanitary | 5.6% | Rubble & concrete | 5.0% | Timber | 12.6% | Rubber | 0.4% | Potentially hazardous | 1.9% | TOTAL | 100% |
| Composition of overall waste to Whitford Landfill 2005 – 2006 | % of total   |   |            |       |       |          |       |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |      |       |      |
| Paper   | 17.2%  |   |            |       |       |          |       |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |      |       |      |
| Plastics  | 15.3%  |   |            |       |       |          |       |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |      |       |      |
| Putrescibles  | 29.3%  |   |            |       |       |          |       |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |      |       |      |
| Ferrous metals  | 4.7%   |   |            |       |       |          |       |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |      |       |      |
| Non-ferrous metals  | 0.6%   |   |            |       |       |          |       |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |      |       |      |
| Glass   | 3.4%   |   |            |       |       |          |       |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |      |       |      |
| Textiles  | 4.0%   |   |            |       |       |          |       |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |      |       |      |
| Nappies & sanitary  | 5.6%   |   |            |       |       |          |       |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |      |       |      |
| Rubble & concrete   | 5.0%   |   |            |       |       |          |       |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |      |       |      |
| Timber  | 12.6%  |   |            |       |       |          |       |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |      |       |      |
| Rubber  | 0.4%   |   |            |       |       |          |       |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |      |       |      |
| Potentially hazardous   | 1.9%   |   |            |       |       |          |       |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |      |       |      |
| TOTAL   | 100%   |   |            |       |       |          |       |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |      |       |      |
| Redvale Landfill  |  |   |            |       |       |          |       |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |      |       |      |
| Tonnage   | <p>Aggregated tonnage and data from Hampton Downs Landfill have been provided for the calculations by ARC. Only aggregated totals for the landfills in the Auckland region have been made available. Therefore the tonnage to Redvale Landfill must be estimated using the available information. For the purposes of these calculations, it is assumed that Whitford Landfill is operating at its maximum capacity permitted by its resource consents (200,000 tonnes per annum).</p> <p>Of the total to Redvale, it is estimated that 50,000 tonnes per annum are from Northland Region., and is not waste from the Auckland region.</p>   |   |            |       |       |          |       |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |      |       |      |

<sup>29</sup> Northland Regional Council 2007 State of the Environment Report at [http://www.nrc.govt.nz/upload/3879/4%20-%20Solid%20Waste%20Management\\_2.pdf](http://www.nrc.govt.nz/upload/3879/4%20-%20Solid%20Waste%20Management_2.pdf)

| Composition  | <p>The composition of waste disposed of at Redvale Landfill is assumed to be that determined by the SWAP audit undertaken at the facility in 2006 by Waste Not Consulting. As the composition is reported to ARC as part of the facility's resource consent conditions, the results are in the public domain. The composition is given below.</p> <table border="1"> <thead> <tr> <th>Composition of overall waste to Redvale Landfill – 2005 – 2006 –</th> <th>% of total</th> </tr> </thead> <tbody> <tr> <td>Paper</td> <td>8.3%</td> </tr> <tr> <td>Plastics</td> <td>7.1%</td> </tr> <tr> <td>Putrescibles</td> <td>17.6%</td> </tr> <tr> <td>Ferrous metals</td> <td>3.6%</td> </tr> <tr> <td>Non-ferrous metals</td> <td>0.7%</td> </tr> <tr> <td>Glass</td> <td>1.9%</td> </tr> <tr> <td>Textiles</td> <td>2.7%</td> </tr> <tr> <td>Nappies &amp; sanitary</td> <td>2.7%</td> </tr> <tr> <td>Rubble &amp; concrete</td> <td>9.2%</td> </tr> <tr> <td>Timber</td> <td>13.1%</td> </tr> <tr> <td>Rubber</td> <td>1.4%</td> </tr> <tr> <td>Potentially hazardous</td> <td>31.8%</td> </tr> <tr> <td>TOTAL</td> <td>100.0%</td> </tr> </tbody> </table> <p>Note: Where data has not been based on actual measurements available estimates are used.</p> <p>Note that 32% of the total waste stream to Redvale Landfill has been classified as 'Potentially hazardous'. If it is assumed that this material is primarily sludges and contaminated soil, and this material is removed from the calculations, then the composition of the 'general' waste (with an assumed 1% now being 'Potentially hazardous, as the 1% figure is common to most waste streams) can be calculated.</p> <p>As there is no means of differentiating from the available data the composition of waste from Northland Region from the composition of waste from Auckland Region, it is assumed that the composition of the overall waste stream to Redvale Landfill is the same as the composition of waste from the Auckland Region being disposed of at Redvale Landfill.</p> | Composition of overall waste to Redvale Landfill – 2005 – 2006 – | % of total | Paper | 8.3% | Plastics | 7.1% | Putrescibles | 17.6% | Ferrous metals | 3.6% | Non-ferrous metals | 0.7% | Glass | 1.9% | Textiles | 2.7% | Nappies & sanitary | 2.7% | Rubble & concrete | 9.2% | Timber | 13.1% | Rubber | 1.4% | Potentially hazardous | 31.8% | TOTAL | 100.0% |
|--|--|--|------------|-------|------|----------|------|--------------|-------|----------------|------|--------------------|------|-------|------|----------|------|--------------------|------|-------------------|------|--------|-------|--------|------|-----------------------|-------|-------|--------|
| Composition of overall waste to Redvale Landfill – 2005 – 2006 – | % of total   |  |            |       |      |          |      |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |       |       |        |
| Paper  | 8.3%   |  |            |       |      |          |      |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |       |       |        |
| Plastics   | 7.1%   |  |            |       |      |          |      |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |       |       |        |
| Putrescibles   | 17.6%  |  |            |       |      |          |      |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |       |       |        |
| Ferrous metals   | 3.6%   |  |            |       |      |          |      |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |       |       |        |
| Non-ferrous metals   | 0.7%   |  |            |       |      |          |      |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |       |       |        |
| Glass  | 1.9%   |  |            |       |      |          |      |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |       |       |        |
| Textiles   | 2.7%   |  |            |       |      |          |      |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |       |       |        |
| Nappies & sanitary   | 2.7%   |  |            |       |      |          |      |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |       |       |        |
| Rubble & concrete  | 9.2%   |  |            |       |      |          |      |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |       |       |        |
| Timber   | 13.1%  |  |            |       |      |          |      |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |       |       |        |
| Rubber   | 1.4%   |  |            |       |      |          |      |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |       |       |        |
| Potentially hazardous  | 31.8%  |  |            |       |      |          |      |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |       |       |        |
| TOTAL  | 100.0%   |  |            |       |      |          |      |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |       |       |        |
| <b>Hampton Downs Landfill</b>                                    |  |  |            |       |      |          |      |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |       |       |        |
| Tonnage  | An annual tonnage figure for waste from the Auckland Region disposed of at Hampton Downs Landfill for the period 2007-2008 has been provided to ARC by EnviroWaste Services Ltd. A figure for 'special' waste has also been provided. These data can not be published due to reasons of commercial sensitivity.  |  |            |       |      |          |      |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |       |       |        |
| Composition  | The only information available on the composition of waste from the Auckland Region discharged at Hampton Downs is that the proportion of 'sludge/contaminated soil' fraction can be calculated and that all of the domestic kerbside refuse from Papakura District and Franklin District and  |  |            |       |      |          |      |              |       |                |      |                    |      |       |      |          |      |                    |      |                   |      |        |       |        |      |                       |       |       |        |

|  | <p>a portion of that from Auckland City is disposed of at the facility.</p> <p>To calculate the composition of waste from the Auckland Region discharged at Hampton Downs, the composition of waste to Redvale Landfill (with sludge/contaminated soil excluded) and Whitford Landfill have been combined proportionally, based on the tonnage estimated to be discharged at each facility.</p> <p>To account for the proportionally smaller quantity of domestic kerbside refuse being discharged at Hampton Downs, domestic waste from the five other local authorities has been 'removed' from the combined Redvale/Whitford waste stream (taking into account that waste from the Auckland City East kerbside collection contract is disposed of at Hampton Downs Landfill).</p> <p>The composition of the remainder of the waste disposed of at Redvale and Whitford can be calculated, and is assumed, in the absence of any other information, to be the composition of waste discharged at Hampton Downs.</p>   |  |                  |            |       |         |       |          |         |      |              |         |       |                |        |      |                    |       |      |       |        |      |          |        |      |                    |        |      |                   |         |      |        |         |       |        |        |      |                       |         |       |              |                  |               |
|--|---|--|------------------|------------|-------|---------|-------|----------|---------|------|--------------|---------|-------|----------------|--------|------|--------------------|-------|------|-------|--------|------|----------|--------|------|--------------------|--------|------|-------------------|---------|------|--------|---------|-------|--------|--------|------|-----------------------|---------|-------|--------------|------------------|---------------|
| <b>Overall waste to landfill from Auckland Region</b>                                    |   |  |                  |            |       |         |       |          |         |      |              |         |       |                |        |      |                    |       |      |       |        |      |          |        |      |                    |        |      |                   |         |      |        |         |       |        |        |      |                       |         |       |              |                  |               |
| <b>Tonnage</b>   | The annual tonnage of waste generated in the Auckland Region that is disposed of to landfill in 2007-2008 is calculated to be 1,396,432 tonnes. This figure includes all types of waste to all four landfills receiving waste from the Region.  |  |                  |            |       |         |       |          |         |      |              |         |       |                |        |      |                    |       |      |       |        |      |          |        |      |                    |        |      |                   |         |      |        |         |       |        |        |      |                       |         |       |              |                  |               |
| <b>Composition</b>   | <p>The composition of the overall waste stream from Auckland Region that is disposed of to landfill has been calculated by combining the tonnages and composition data from the previous tables in this section.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Composition of overall waste to landfill from Auckland Region including 'special wastes'</th> <th>Tonnes per annum</th> <th>% of total</th> </tr> </thead> <tbody> <tr> <td>Paper</td> <td>145,015</td> <td>10.4%</td> </tr> <tr> <td>Plastics</td> <td>124,646</td> <td>8.9%</td> </tr> <tr> <td>Putrescibles</td> <td>266,249</td> <td>19.1%</td> </tr> <tr> <td>Ferrous metals</td> <td>55,874</td> <td>4.0%</td> </tr> <tr> <td>Non-ferrous metals</td> <td>9,482</td> <td>0.7%</td> </tr> <tr> <td>Glass</td> <td>31,939</td> <td>2.3%</td> </tr> <tr> <td>Textiles</td> <td>41,787</td> <td>3.0%</td> </tr> <tr> <td>Nappies &amp; sanitary</td> <td>41,465</td> <td>3.0%</td> </tr> <tr> <td>Rubble &amp; concrete</td> <td>121,539</td> <td>8.7%</td> </tr> <tr> <td>Timber</td> <td>191,592</td> <td>13.7%</td> </tr> <tr> <td>Rubber</td> <td>17,309</td> <td>1.2%</td> </tr> <tr> <td>Potentially hazardous</td> <td>349,535</td> <td>25.0%</td> </tr> <tr> <td><b>TOTAL</b></td> <td><b>1,396,432</b></td> <td><b>100.0%</b></td> </tr> </tbody> </table> <p>Note: Where data has not been based on actual measurements available estimates are used.</p> | Composition of overall waste to landfill from Auckland Region including 'special wastes' | Tonnes per annum | % of total | Paper | 145,015 | 10.4% | Plastics | 124,646 | 8.9% | Putrescibles | 266,249 | 19.1% | Ferrous metals | 55,874 | 4.0% | Non-ferrous metals | 9,482 | 0.7% | Glass | 31,939 | 2.3% | Textiles | 41,787 | 3.0% | Nappies & sanitary | 41,465 | 3.0% | Rubble & concrete | 121,539 | 8.7% | Timber | 191,592 | 13.7% | Rubber | 17,309 | 1.2% | Potentially hazardous | 349,535 | 25.0% | <b>TOTAL</b> | <b>1,396,432</b> | <b>100.0%</b> |
| Composition of overall waste to landfill from Auckland Region including 'special wastes' | Tonnes per annum  | % of total   |                  |            |       |         |       |          |         |      |              |         |       |                |        |      |                    |       |      |       |        |      |          |        |      |                    |        |      |                   |         |      |        |         |       |        |        |      |                       |         |       |              |                  |               |
| Paper  | 145,015   | 10.4%  |                  |            |       |         |       |          |         |      |              |         |       |                |        |      |                    |       |      |       |        |      |          |        |      |                    |        |      |                   |         |      |        |         |       |        |        |      |                       |         |       |              |                  |               |
| Plastics   | 124,646   | 8.9%   |                  |            |       |         |       |          |         |      |              |         |       |                |        |      |                    |       |      |       |        |      |          |        |      |                    |        |      |                   |         |      |        |         |       |        |        |      |                       |         |       |              |                  |               |
| Putrescibles   | 266,249   | 19.1%  |                  |            |       |         |       |          |         |      |              |         |       |                |        |      |                    |       |      |       |        |      |          |        |      |                    |        |      |                   |         |      |        |         |       |        |        |      |                       |         |       |              |                  |               |
| Ferrous metals   | 55,874  | 4.0%   |                  |            |       |         |       |          |         |      |              |         |       |                |        |      |                    |       |      |       |        |      |          |        |      |                    |        |      |                   |         |      |        |         |       |        |        |      |                       |         |       |              |                  |               |
| Non-ferrous metals   | 9,482   | 0.7%   |                  |            |       |         |       |          |         |      |              |         |       |                |        |      |                    |       |      |       |        |      |          |        |      |                    |        |      |                   |         |      |        |         |       |        |        |      |                       |         |       |              |                  |               |
| Glass  | 31,939  | 2.3%   |                  |            |       |         |       |          |         |      |              |         |       |                |        |      |                    |       |      |       |        |      |          |        |      |                    |        |      |                   |         |      |        |         |       |        |        |      |                       |         |       |              |                  |               |
| Textiles   | 41,787  | 3.0%   |                  |            |       |         |       |          |         |      |              |         |       |                |        |      |                    |       |      |       |        |      |          |        |      |                    |        |      |                   |         |      |        |         |       |        |        |      |                       |         |       |              |                  |               |
| Nappies & sanitary   | 41,465  | 3.0%   |                  |            |       |         |       |          |         |      |              |         |       |                |        |      |                    |       |      |       |        |      |          |        |      |                    |        |      |                   |         |      |        |         |       |        |        |      |                       |         |       |              |                  |               |
| Rubble & concrete  | 121,539   | 8.7%   |                  |            |       |         |       |          |         |      |              |         |       |                |        |      |                    |       |      |       |        |      |          |        |      |                    |        |      |                   |         |      |        |         |       |        |        |      |                       |         |       |              |                  |               |
| Timber   | 191,592   | 13.7%  |                  |            |       |         |       |          |         |      |              |         |       |                |        |      |                    |       |      |       |        |      |          |        |      |                    |        |      |                   |         |      |        |         |       |        |        |      |                       |         |       |              |                  |               |
| Rubber   | 17,309  | 1.2%   |                  |            |       |         |       |          |         |      |              |         |       |                |        |      |                    |       |      |       |        |      |          |        |      |                    |        |      |                   |         |      |        |         |       |        |        |      |                       |         |       |              |                  |               |
| Potentially hazardous  | 349,535   | 25.0%  |                  |            |       |         |       |          |         |      |              |         |       |                |        |      |                    |       |      |       |        |      |          |        |      |                    |        |      |                   |         |      |        |         |       |        |        |      |                       |         |       |              |                  |               |
| <b>TOTAL</b>   | <b>1,396,432</b>  | <b>100.0%</b>  |                  |            |       |         |       |          |         |      |              |         |       |                |        |      |                    |       |      |       |        |      |          |        |      |                    |        |      |                   |         |      |        |         |       |        |        |      |                       |         |       |              |                  |               |

### 5.3 Tonnage and composition of waste to cleanfills and managed fills

With limited specific information available, the quantity and composition of materials disposed of to managed fills and cleanfills has been estimated based on information in the public domain (Watercare, NZ Steel, total capacity and quantity information on ARC consent files and per capita estimates based on detailed information in Canterbury).

The sources and limitations of the data presented below are as follows:

- Managed Fill – Quantity information published by Watercare and NZ Steel, data held on consent files. The estimate for remaining sites is based on historical fill volumes and consent application (Winstone Aggregates, replacement for Puketutu Island Quarry including estimate of annual quantity).
- Cleanfill – in some cases consent records have information about the total capacity, annual quantities (both in m<sup>3</sup>) and/or cleanfill area (in Ha). Total capacity was converted to an annual estimate based on consent term. Estimates for the remaining consented cleanfill sites were developed based on the number of sites and using an average quantity per Ha. Both of these methods are far from perfect. Data in Canterbury is relatively detailed due to the implementation of a bylaw covering cleanfill disposal in Christchurch including reporting requirements. The estimates developed as noted above and the based on the per capita figures from Canterbury provide a range for the quantity of materials disposed to Managed fills and Cleanfills in the Auckland Region.

**Table 9** Summary of Data and Estimates for Disposal of Material to Managed Fill and Cleanfill

|  | Estimate (T/yr) | Data Used (T/yr) |
|--|-----------------|------------------|
| Managed Fills – data available   |                 | 260000           |
| Managed Fills – estimate for remaining sites (3)                             | 360000          | 360000r          |
| Cleanfills – estimate based on available capacity or annual quantity data    | 400000          | 400000           |
| Cleanfills – estimate for remaining sites based on cleanfill area            | 770000          | 770000r          |
| Cleanfills – estimate for remaining sites based on number of sites           | 930000          |                  |
| Estimate of total managed fill/cleanfill disposal (based on Canterbury data) | 2,170,000       |                  |
| Total quantity of material disposed of to Managed Fill and Cleanfill         |                 | 1790000          |
| Range  | 1,790,000 to    | 2,170,000        |

Note: Where data has not been based on actual measurements available estimates are used.

For the purposes of analysis, and based on experience in other regions, the following waste composition has been assumed for managed fills and cleanfills:

- 2% of the material disposed comprises green waste – most consent conditions or permitted activity rules allow for a small quantity of green waste. This is typically ground cover (grass, shrubs, tree stumps etc) from sites clearances;
- 30% of the material disposed comprises construction and demolition materials – managed fills and cleanfills operating under permitted activity rules are able to accept concrete/rubble (inert materials). Managed fills may also accept plasterboard and limited quantities of construction or demolition timber and metals in mixed loads.
- The remaining 68% of material disposed comprises [uncontaminated] soil, rock, clay, or similar material.

#### 5.4 Tonnage and composition of diverted materials

The estimate of the quantity and composition of materials diverted from landfill (municipal, cleanfill and managed fill) has been developed based on a mixed of information in the public domain and discussions with key aggregators or processors of materials. Local authority recycling activity is an important component of the recycling market but all of the materials collected are handled by one of the aggregators or processors. The data presented in Table 10 is based on data provided by key aggregators of materials rather than organisations collecting materials from businesses or households.

The sources and limitations of the data presented below are as follows:

- Commodities – data from processors or exporters of materials including Paper Reclaim, Visy Recycling, Owens Illinois and Carter Holt Harvey;
- Wood waste – data from major users and processors of wood waste in the Auckland Region. The figure presented in Table 10 is based on wood fired boilers identified in EECA's recent national survey of heat plant<sup>30</sup> and discussion with wood waste processors.
- Organic waste – major processors of organic waste including Living Earth, EnviroFert, Sustainable Waste Management, and Eco Stock Food. This figure is based on estimates provided by operators and does not include home composting.
- Concrete – companies converting concrete into aggregate for sale as aggregate. This figure is based on information supplied from the two major reprocessors and includes material re-processed on a demolition site for use as fill/construction material in the place of aggregate.

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<sup>30</sup> Heat Plant in New Zealand, March 2008 (EECA, MED and Bioenergy Assn, available from <http://www.bioenergy.org.nz/documents/publications/HeatPlant/HeatingPlantDatabase2008.pdf>)

- Scrap – an estimate for the Auckland Region based on information published by the Scrap Metal Recyclers Association of New Zealand and Pacific Steel.
- Other – estimates based on information provided by major waste producers and a number of processors. This includes re-processing of materials for sale as aggregate (steel slag), the use of plasterboard as a compost additive and shredding of tyres for matting/bedding material.

**Table 10** Summary of Data on Diversion of Materials from Landfill

| Materials                    | Quantity (T/yr) | Comments   |
|------------------------------|-----------------|--|
| Commodities                  |                 |  |
| Plastics                     | 11,000          | Auckland and export  |
| Glass                        | 68,000          | Packaging and fibreglass   |
| Paper/Card                   | 160,000         | Auckland and export  |
| Cans                         | 8,000           | Auckland and export  |
| Total Commodities            | 247,000         |  |
| Wood waste                   | 60,000          | Biofuel, Mulch   |
| Organic waste                |                 |  |
| Composting                   | 82,000          | Auckland sourced material is processed in Auckland, Waikato, Taranaki, & Northland |
| Other recovery               | 110,000         | Rendering, stock food  |
| Total Organic waste diverted | 192,000         |  |
| Aggregate                    | 980,000         | Crushed concrete, slag   |
| Concrete                     | 400,000         |  |
| Steel making slag            | 580,000         | Roading aggregate  |
| Scrap Metal                  | 176,000         | Auckland and export  |
| Other                        | 12,000          | compost additive, tyres, land application  |
| TOTAL                        | 1,667,000       |  |

Note: Where data has not been based on actual measurements available estimates are used.

## 5.5 Summary of waste disposal

Table 11 provides a summary of the data collected on waste disposal and diversion in the Auckland Region. This draws on the information presented in Sections 4.2 – 4.5 and includes a number of assumptions and limitations. These include:

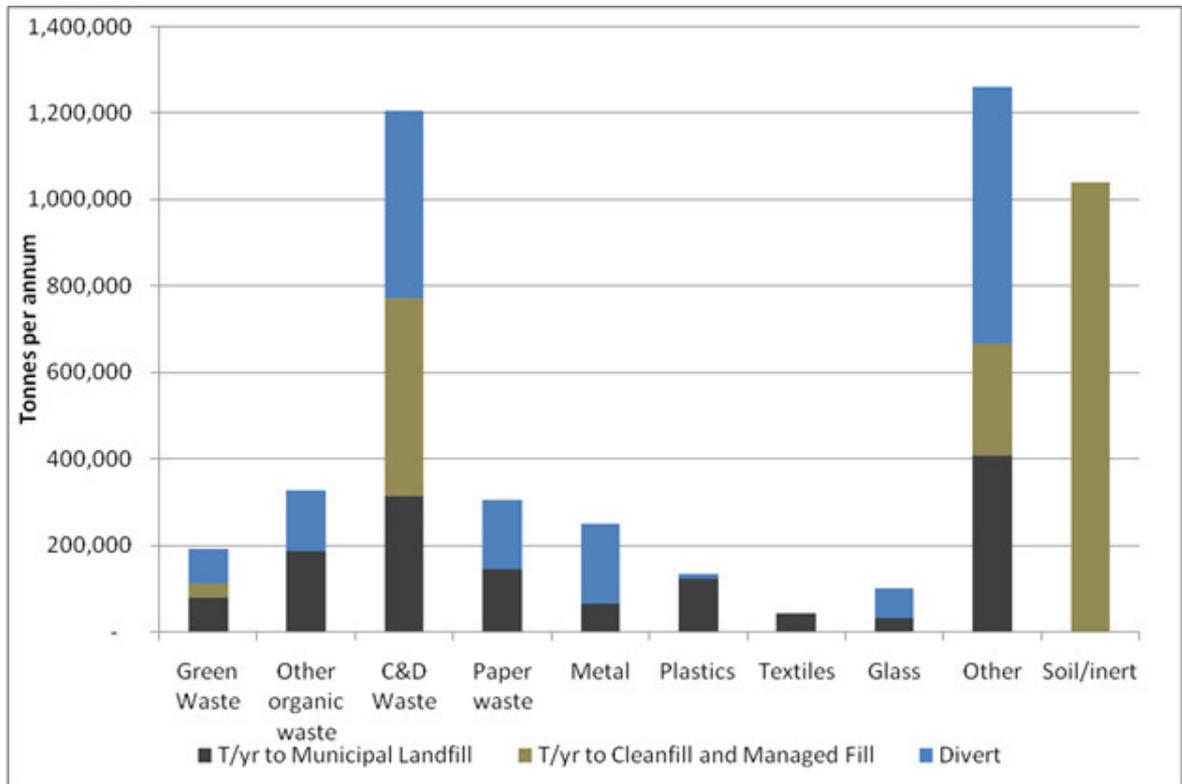
- Cleanfill quantities have been estimated based on limited estimates of annual quantity and conversions from m<sup>3</sup> to tonnes;
- Materials diversion figures are based on quantity estimates provided by key processors or aggregators of materials.

**Table 11** Summary of Data on Waste Disposal and Diversion in the Auckland Region

| Disposal or Diversion |   | Quantity (T/yr) |
|-----------------------|---|-----------------|
| Waste to Disposal     | To managed fills                                  | 260,000         |
|                       | To cleanfills                                     | 1,530,000       |
|                       | To municipal landfill                             | 1,396,000       |
|                       | Total Disposal                                    | 3,186,000       |
| Materials Diverted    | Commodities (paper, card, plastic, glass, cans)   | 247,000         |
|                       | Wood waste  | 60,000          |
|                       | Organic waste diverted                            | 192,000         |
|                       | Aggregate   | 980,000         |
|                       | Scrap   | 176,000         |
|                       | Other (compost additive, tyres, land application) | 12,000          |
|                       | Total diversion                                   | 1,667,000       |
|                       | Diversion percentage                              | 34.3            |
| Total Waste Stream    | Diverted, landfill, cleanfill & managed fill      | 4,853,000       |

Note: Where data has not been based on actual measurements available estimates are used.

**Figure 5** Tonnes of Waste Disposed of to Landfill or Diverted for Key Waste Streams



## 5.6 Correlation with Data to be collected by MfE

In the 2009 discussion document<sup>31</sup> MfE proposed that the 'composition' of waste be monitored at landfill. This composition is different to that measured using the Solid Waste Analysis Protocol (based on a physical audit of the waste stream) in that the categories are based on the source of the waste. Where waste composition data is available for each of the sources it may be possible to derive the composition of the overall waste stream.

The categories proposed by MfE were:

- cover (with type of cover specified);
- kerbside collection;
- transfer station;
- special (with type of special waste specified);
- construction and demolition;
- landscape waste;
- commercial and industrial; and
- residential.

The data collected in the research underlying this report does not break down the material disposed of to landfill into these categories.

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<sup>31</sup> Waste Minimisation in New Zealand - A Discussion Document from the Ministry for the Environment, March 2009; Ref. ME924

## 6 Evaluation of waste data

### 6.1 Introduction

This section considers the wider question of what waste data are required to monitor and manage waste in the Auckland Region as well as to establish policy and strategy. It looks at how these requirements match up with the data that are currently available, provides an analysis of the gaps, and makes recommendations as to how these gaps may be most effectively addressed.

#### 6.1.1 Overview

Section 5.2 provides a brief overview of issues that impact on the generation and usability of waste data. Section 5.3 discusses the different uses of waste data and how the required information and levels of detail vary. Sections 5.4 and 5.5 examine what data are likely to be required for managing waste at a strategic level in the Auckland region. Section 5.6 provides an analysis of what data are actually available and section 5.7 then compares data requirements with available data and notes whether or not current data are likely to be adequate for the purposes of managing waste at a strategic level. Section 5.8 discusses key gaps and barriers in data provision, while 5.9 puts forward possible initiatives to address those gaps.

### 6.2 Waste data issues

Before beginning an analysis of waste data requirements it is worthwhile discussing briefly some of the issues and complexities surrounding the generation and management of waste data generally. These issues clearly impact on the quality and availability of waste data in the Auckland Region.

#### 6.2.1 Definition of waste

One of the inherent difficulties in generating waste information lies in the fact that it is exceedingly difficult to produce an accurate definition of 'waste'. This is essentially because waste is a perception of value rather than an actual physical material, and that perception of value can change throughout the lifecycle of a material as well as according to different parties involved. This means that at the boundaries, the question of when something becomes waste is blurred<sup>32</sup> (for example, is a manufacturing by-product a 'recovered material'?). Defining what is included in an analysis of waste (and waste data) can therefore be problematic.

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<sup>32</sup> The Waste Minimisation Act 2008 (5[1]) defines waste as "Any thing disposed of or discarded".

## 6.2.2 Definitions of waste streams

Waste streams can be classified in a number of ways, for example: by material (e.g. paper, plastic, glass, etc); by source (e.g. construction and demolition, retail); by some inherent property (e.g. hazardous, putrescible); by function (e.g. packaging); by activity (e.g. litter); or by some combination of these (e.g. household plastic packaging).

Although there are some common conventions, these waste stream classifications are not clearly defined or universally used, and definitions will vary according to the party generating the information and the purpose for which it is intended. Even apparently straightforward classifications can be blurred at the edges, for example multi-material packaging products could be a combination of paper, plastic and metal, or certain materials may be contaminated with other substances.

## 6.2.3 Measures for waste

The most widely accepted measure for waste is weight – this is because the weight of a material is constant, whereas its volume will change according to the amount of compaction applied and whether material is broken down or whole. However, obtaining accurate weights for waste materials can generally only be done where there is a weighbridge – which is usually only at transfer stations, processing facilities, or disposal facilities (and not at all of them). This limits the points at which waste data can be accurately captured. This means that, in practice, measures of waste often involve using estimates (average weights of bins of known volume, bulk densities of materials etc), or sampling of loads. Other measures that are commonly used for waste include the numbers of customers/pickups (households, businesses etc), participation (how many people use a service in total), set out (how many people use a service each collection), composition by material type, number of vehicle loads, geographic data, and source and destination information. This may involve surveys or sampling, or measures taken at static points in time – all of which introduce at least some level of inaccuracy or uncertainty.

## 6.2.4 Proprietary data

One of the key difficulties in generating data for waste management and minimisation policy and strategy purposes is that much of the data required to assemble a picture of waste management at a regional level (in any region) is not in the public domain (this arises from the structure of the industry discussed in section 4.1). In the context of a market where waste collection, recycling, and disposal companies are actively competing for collection and disposal/processing business, much of the information is considered commercially sensitive. Commercial sensitivity can in part be addressed by presenting data in aggregated form that prevents company-level information being identified<sup>33</sup>. In the Auckland Region the most important impact of this element relates

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<sup>33</sup> This strategy has been employed in seeking proprietary data from waste disposal companies and processors of materials (recycling and composting) for this report.

to difficulties in obtaining waste tonnage and composition information for waste sent to Hampton Downs Landfill in the Waikato Region. The other two major landfills serving the region, Redvale and Whitford, are required by the terms of their resource consents to report tonnage and composition regularly to ARC.

#### 6.2.5 Limited standard reporting protocols

A further issue that introduces additional complexity to the waste data picture is the fact that virtually all agencies, including local and central government, report waste data in slightly differing ways (depending usually on what the information is intended for). A diversion rate, for example, could refer to all household waste or just household collected waste, it could include transfer station material, it may or many not include commercial waste streams, and it may or may not account for cleanfill material etc.<sup>34</sup>

#### 6.2.6 Potential double counting

When compiling waste data, care needs to be taken to ensure that material is not double-counted. Waste and recycled materials are commonly bulked, stored, and transferred a number of times on their way to their final destination, and a number of different operators may handle the same material. Simply adding up the quantities of materials handled by operators therefore risks double- (or triple-) counting material.

#### 6.2.7 Comment on waste data issues

The above issues sound a note of caution in respect of waste data. It is important, therefore, when reviewing waste data that care is taken in understanding how it has been generated, what it refers to, and how it can be properly and usefully applied.

### 6.3 Uses of waste data

There are a number of purposes for gathering and analysing waste data. These include:

- Setting national, regional, or local policy
- Monitoring and measuring policy effectiveness and the achievement of targets or specific objectives
- Identifying needs and gaps
- Design and implementation of new services and monitoring the adequacy of existing services

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<sup>34</sup> It should be noted however that a number of these issues are being addressed by MfE with protocols in place around reporting of landfill data (for the purposes of the Landfill Levy), waste composition data, and landfill census data. The Ministry's proposed revised targets also contain a number of targets focused on introducing waste data collection protocols.

- Providing information for the ongoing delivery of waste management services.

The information that is required for each of these purposes differs. In general, the detail and specificity of the data needs increases as you move down the list. Setting policy will generally only require aggregated high level data on quantities and composition to landfill as well, possibly, as information on material diverted. By contrast, quite detailed operational data is required to facilitate the delivery of waste management services (for example information down to the level of individual premises serviced).

This document is primarily concerned with bringing together and analysing information that is important for the setting of policy and the monitoring of targets<sup>35</sup>. It has been assumed that data needs for operational management of waste services is met adequately by the operators' own internal systems.

Supporting data may enable consideration of factors that are considered to influence the generation of waste, and could include:

- A measure of construction activity, such as number of building consents issued
- A measure of economic activity, such as regional or national GDP
- Population and/or household numbers
- Participation, set out rates, and other survey information

#### 6.4 Analysis of data required to monitor and measure waste effectively

For the purposes of conducting this analysis, important targets and waste stream priorities were identified from key documents including the NZ Waste Strategy (2002), Regional Waste Priorities work (see Section 2.5), and the Draft Revised Strategy Targets put forward in the MfE Waste Minimisation Discussion Document. It should be noted that the targets and priority areas identified are not firmly established and are likely to be subject to change. However, even if the specifics of the targets and priority areas do change, any replacements are likely to have similarities to those already put forward. As this analysis is aiming to identify potential data needs, it is considered that this approach provides a reasonable basis on which to proceed.

The table below shows priority waste streams and action areas identified in the national and regional level documents listed previously. It is considered probable that there will be waste data requirements around these workstreams, if not immediately, then at some point in the future. The majority of probable current and future waste data requirements should therefore be able to be identified from this set of priority waste streams and action areas.

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<sup>35</sup> This document notes specific targets or potential target or work areas that have been identified by at a national or regional level. In addition to this however a number of possible target areas are noted which are not identified in other documents but which are deemed likely to play a role in waste management in the region going forward.

**Table 12:** Waste Data Priority Areas

| Waste Data area                    | Regional<br>Priorities Work | NZ Waste<br>Strategy (2002) | Proposed<br>Revised<br>Strategy Targets | Reference in<br>this document |
|------------------------------------|-----------------------------|-----------------------------|---|-------------------------------|
| Organic                            | ✓                           | ✓                           | ✓                                       | 5.5.1                         |
| C&D                                | ✓                           | ✓                           | ✓                                       | 5.5.2                         |
| Special Wastes                     | ✓                           | ✓                           |   | 5.5.3                         |
| Hazardous                          | ✓                           | ✓                           | ✓                                       | 5.5.4                         |
| Packaging and<br>other recyclables | ✓                           |                             |   | 5.5.5                         |
| Inorganics                         | ✓                           |                             |   | 5.5.6                         |
| Residual                           | ✓                           | ✓                           | ✓                                       | 5.5.7                         |
| Illegal dumping<br>and litter      | ✓                           |                             |   | 5.5.8                         |
| Contaminated<br>Soil               |                             | ✓                           | ✓                                       | 5.5.9                         |

#### 6.4.1 Note on recovered materials market information

Strictly speaking, to manage waste streams effectively in relation to recovery of materials, it is important to have a working knowledge of existing and potential markets for recovered materials. Material markets will to a large extent drive the recovery of materials irrespective of public sector action. If a material is deemed to have sufficient value (for example: non-ferrous metals) this equates to commercial opportunity, and the market will in many instances meet this demand.

This is not to say that markets are the complete answer: Frequently the value of materials may not be consistently high enough to sustain a pure market approach and the public sector may deem there to be environmental benefits from recovering these materials; there may be infrastructure issues associated with recovery or reprocessing of material that requires public sector investment; and there may be quality, health and safety, or environmental issues associated with recovery that requires public sector intervention/regulation.

In broad terms, however, the public sector acts to stimulate recovery of those elements of the waste stream for which the demand is marginal. Environmental concerns aside, there is little point in recovering and separating materials for which there is no market. Therefore, if the public sector is to attempt to stimulate resource recovery, knowledge of the level of demand, potential material uses and markets, and what may be required to stimulate this demand is an important facet of the broader waste management picture. While the importance of market information is therefore acknowledged, the focus of this report is in essence on the 'supply side' of waste management, and analysis of markets and market information is deemed outside the scope of this report.

## 6.5 Priorities and targets and associated data requirements

The data requirements for monitoring and managing each of the waste streams listed in Table 12 are discussed in the following sections. In addition to the priorities and targets noted in Table 12, data requirements for ongoing management of waste streams are also noted.

### 6.5.1 Organic

|   |  |
|---|--|
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | MfE Target 3: By 2012, have a system in place for the ongoing monitoring of the composition of organic waste, the amount disposed of at landfills and diverted from the waste stream. (MfE Proposed Revised National Target, March 2009)   |
| Data required for measurement                                   | Total waste to landfill<br>Composition of organic waste in the residual (compostable green waste; non compostable green waste; food waste; other compostable; other non-compostable organic)<br>Tonnes of green waste diverted<br>Tonnes of food waste diverted<br>Tonnage of other organic diverted   |
| Notes   | 'Organic' waste is not adequately defined in the MfE document. The target does not state clearly whether composition is referring to organic material in the waste stream or diverted material. In order to manage the waste stream it would be important to have both. Data on 'diversion' of organic wastes through some methods, such as home composting, are very difficult to obtain. |
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | Collection of organic waste from households (Regional priority action)   |
| Data required for measurement                                   | Composition of household collected waste<br>Tonnes of household collected waste<br>Tonnes of organic waste collected<br>Composition of organic waste collected<br>Participation data   |
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | Manage organic waste stream by monitoring any other disposal avenues (Supporting action)   |
| Data required for measurement                                   | Tonnes of material separated at transfer station<br>Tonnes of residual waste at transfer station<br>Composition of transfer station waste<br>Use of 'insink waste disposal units'<br>Alternative disposal options such as illegal dumping and disposal by arborists  |

### 6.5.2 Construction and demolition waste

|   |   |
|---|---|
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | MfE Target 4: By 2012, have a system in place for the ongoing monitoring of the generation and composition of construction and demolition waste, the amount diverted from the waste stream and the amount disposed of. (MfE Proposed Revised National Target, March 2009)   |
| Data required for measurement                                   | Quantities & composition of C&D material collected<br>Quantities & composition of C&D material deposited at transfer stations<br>Quantities of C&D material diverted (concrete, brick, rock, soil, asphalt, glass, timber, steel, aluminium, plastic wrap, plastic piping, etc)<br>Quantities & composition of C&D material deposited at landfill<br>Quantities & composition of C&D material deposited at cleanfill/managed fill<br>Mass balance of building materials |
| Notes   | C&D waste is not well-defined in the MfE document. It generally is considered to include rubble, soil and timber, but these can also come from other sources and C&D waste will tend to also include materials like plastic, steel, chemicals, glass etc. In addition it is not clear if diversion refers to diversion from landfill or if it is to include diversion from cleanfill as well.   |

|   |   |
|---|---|
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | Encourage separation of wastes on-site (Regional priority action)   |
| Data required for measurement                                   | Information on construction sites/C&D operators<br>Information on site practices (survey information)   |
| Notes   | Site waste management plans are one option for improving separation/diversion of C&D material. Site waste management plans could be implemented through a bylaw and also include reporting requirements which would be a potential data source. |
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | Establish RRP network (Regional priority action)  |
| Data required for measurement                                   | Information on C&D waste generation flows to help target facility location and capacity   |

### 6.5.3 Special wastes (oil, tyres, end-of-life vehicles, batteries etc)

|   |  |
|---|--|
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | May become priority products under the WMA 2008<br>( <i>MfE Discussion Document, March 2009</i> )  |
| Data required for measurement                                   | Quantities of special wastes sent to landfill<br>Composition of special wastes sent to landfill<br>Composition and tonnage for residual household collection |

|       |  |
|-------|--|
|       | <p>Composition and tonnage of residual waste at transfer station</p> <p>Quantities of special wastes diverted by type</p> <p>Special waste producers/generators</p>  |
| Notes | 'Special wastes' is a loose and not well-defined classification. Clearer more precise definitions of the materials/products being targeted are important. In this context, biosolids are not considered to be a 'special' waste. |

|   |   |
|---|---|
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | Establish resource recovery park network<br>(Regional priority action)              |
| Data required for measurement                                   | Information on waste generation flows to help target facility location and capacity |

#### 6.5.4 Hazardous

|   |  |
|---|--|
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | <p>MfE Target 5: By 2012, the Ministry for the Environment will have established a national tracking system for all hazardous waste. (MfE Proposed Revised National Target, March 2009)</p> <p>MfE Target 6: By 2011, the Ministry for the Environment will have investigated the need for, and propose if warranted, regulatory standards for storage, transport, recycling, recovery, treatment and disposal of hazardous wastes. (MfE Proposed Revised National Target, March 2009)</p> |
| Data required for measurement                                   | Yet to be determined   |
| Notes   | The target actions relate to work to be undertaken by the MfE; however Auckland will still need to participate in any tracking system that is established. Although the data that will be required are not yet determined, it is likely to include basic metrics of quantity and type.   |

|   |   |
|---|---|
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | Agricultural chemicals may become priority products under the WMA<br>( <i>MfE Discussion Document, March 2009</i> )   |
| Data required for measurement                                   | <p>Quantities agricultural chemical sent to landfill</p> <p>Composition and tonnage of residual waste at transfer station and landfill</p> <p>Quantities of agricultural chemicals diverted by type</p> <p>Quantities to illegal/private disposal</p> <p>Agricultural Chemical Waste producers/generators</p> |
| Notes   | There is now an industry product stewardship scheme in place (since 1 July 2009). This may affect whether the MfE name agricultural chemicals as a priority product. This new scheme has replaced the Arc AgChem collections from 1 July 2009.  |

|                           |  |
|---------------------------|--|
| <b>Objectives/Targets</b> | Continue to provide HazMobile waste collection |
|---------------------------|--|

|                                    |   |
|------------------------------------|---|
| (and necessary supporting actions) | Provide facilities' at transfer stations/resource recovery parks<br>(Regional priority actions)   |
| Data required for measurement      | Numbers of people using HazMobile<br>Quantities and types of materials collected at HazMobile/transfer stations<br>Composition of the collected waste<br>Composition and tonnage of residual waste at transfer station & landfill |

|   |   |
|---|---|
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | Enhance collection services (e.g. for small businesses)<br>(Regional priority action)                                     |
| Data required for measurement                                   | Quantity of hazardous waste in commercial waste streams<br>Quantities of hazardous wastes diverted from landfill disposal |

#### 6.5.5 Packaging and other recyclables

|   |  |
|---|--|
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | Continue to provide and develop household recyclables collections<br>(Supporting action)                                       |
| Data required for measurement                                   | Household recyclable collection tonnages<br>Composition of recyclables<br>Composition and tonnages of residual collected waste |

|   |   |
|---|---|
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | Provide or investigate public place recycling<br>(Supporting action)  |
| Data required for measurement                                   | Public place recyclable collection tonnages<br>Composition of recyclables<br>Composition and tonnages of litter |

|   |   |
|---|---|
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | Provide or investigate event recycling<br>(Supporting action)   |
| Data required for measurement                                   | Event recyclable collection tonnages<br>Composition of recyclables<br>Composition and tonnages of event waste |

|   |  |
|---|--|
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | Provide and develop recycling centres where appropriate<br>(Supporting action) |
| Data required for measurement                                   | Composition and quantities of recyclables from recycling centres               |
| Notes   | In some areas recycling centres are the alternative to a kerbside collection   |

### 6.5.6 Inorganics

|   |  |
|---|--|
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | Manage inorganic waste by monitoring current kerbside collections<br>(Supporting action)   |
| Data required for measurement                                   | Household inorganic collection tonnages<br>Composition of inorganic collected material<br>Composition and tonnages of residual collected waste<br>Composition and tonnages of transfer station waste<br>Participation data |
| Notes   | As with C&D waste, 'inorganic' is a poorly-defined classification that includes a range of different material types  |

|   |  |
|---|--|
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | Continue/Expand acceptance of inorganics at transfer stations/RRP<br>(Supporting action) |
| Data required for measurement                                   | Composition and tonnages of transfer station waste                                       |

### 6.5.7 Residual

|   |   |
|---|---|
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | MfE Target 1: By 2015, reduce the quantity of waste (tonnes) disposed to landfill per person per year by 20 per cent relative to an established 2010 baseline. (MfE Proposed Revised National Target, March 2009)   |
| Data required for measurement                                   | Annual tonnages to landfill from the Auckland Region<br>Population data   |
| Notes   | The precise definition of what is being included in tonnes to landfill needs to be determined (For example is it all wastes? Does it include 'cleanfill type material?', should sludges, contaminated soil, etc. be included)<br><br>At present, because large tonnages of material are disposed of outside of the Auckland Region these figures are not readily available. |

|   |   |
|---|---|
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | MfE Target 13: By 2012, the Ministry for the Environment will have implemented a waste monitoring and reporting programme to generate consistent data on national waste streams including waste to cleanfills and other disposal sites (e.g., industrial landfills). (MfE Proposed Revised National Target, March 2009) |
| Data required for measurement                                   |   |

|       |   |
|-------|---|
| Notes | This is an action for MfE. It is therefore not clear what requirements will be imposed on local authorities for gathering and compilation of waste data to meet this target. Consistent data on waste to cleanfill may be problematic to generate given the variation in the controls currently in place around cleanfills. |
|-------|---|

|   |   |
|---|---|
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | Continue to manage existing and future disposal contracts and requirements<br>(Supporting action) |
| Data required for measurement                                   | Council collected tonnages to landfill<br>Private sector tonnages to landfill                     |

### 6.5.8 Illegal dumping and litter

|   |  |
|---|--|
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | Manage illegal dumping and litter through current and future contracts;<br>(Supporting action)                               |
| Data required for measurement                                   | Quantities of illegal dumping and litter collected<br>Areas of collection  |
| Notes   | Illegal dumping and litter are noted in the regional priorities document but no specific actions or targets are put forward. |

|   |  |
|---|--|
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | Reducing incidences of illegal disposal and littering<br>(Supporting actions)  |
| Data required for measurement                                   | Quantities of illegal dumping and litter collected<br>Areas of collection<br>Composition of illegal dumping<br>Composition of litter |

### 6.5.9 Contaminated soil

|   |   |
|---|---|
| <b>Objectives/Targets</b><br>(and necessary supporting actions) | MfE Target 9: By 2015, Regional Councils will have established satisfactory systems to record information on contaminated sites and will have assessed which sites pose a high environmental risk. (MfE Proposed Revised National Target, March 2009)<br><br>MfE Target 10: By 2020, Regional Councils will have investigated all contaminated sites identified by 2015 as high risk, and will be implementing an action plan for their management and/or remediation. (MfE Proposed Revised National Target, March 2009) |
| Data required for measurement                                   | Register of contaminated sites<br>Tracking of material from contaminated sites to licensed disposal   |
| Notes   | Management of contaminated soils is a significant issue in terms of   |

waste flows in the Auckland Region. Contaminated soils should go to sanitary landfill but a lack of adequate controls means material can end up in 'cleanfill' sites – effectively just transferring the issue of contamination from one locality to another.

#### 6.5.10 Discussion

One of the first things that become apparent from an analysis of the information in the above tables is that there is a wide range of data required to properly monitor and manage progress towards targets and the operation of supporting actions. There are, however, also significant commonalities in the types of data required across these streams. In general the key measures for the waste streams include:

- The quantity of materials being managed
- The source of these materials
- The method by which they are collected/transported
- The destination of the material
- The composition of material disposed of
- The composition of material recovered

Additional data may be important to generate the measure being used, such as household, population, or participation data. While for any given waste stream the data requirements may appear relatively straightforward, the degree of complexity increases when dealing with multiple materials and multiple sources of material. Accurately and usefully tracking and managing these data is likely to present a number of challenges in terms of information gathering and data systems management.

### 6.6 Assessment of available waste data

The purpose of this section is to identify what waste and recycling data are available and the quality, reliability and usefulness of the information in relation to the key data identified in section 6.4. An inventory of waste flows in the Auckland region was undertaken to detail where waste-related data are potentially able to be generated and where they are currently generated. Appendix A contains the full inventory. This information was then analysed in respect of how it is likely to be used to meet waste management targets and objectives noted in Section 6.5.

Figure 6 provides a simplified illustration of key waste streams and their major flows. Even in a simplified form it can be seen that Auckland's waste flows are very complex. When material and location specific flows are accounted for the level of complexity expands almost exponentially. It is not practical therefore (nor would it necessarily be useful) to detail all waste flows in this section.

## 6.6.1 Waste flow data analysis

The waste flows were analysed in terms of what information could be effectively captured at each juncture in the flow of materials. In conducting the analysis, the quality of the information was broadly grouped according to whether the information that is captured was adequate for the purposes of monitoring and measuring policy effectiveness and the achievement of targets or specific objectives. This analysis showed that the quantity and quality of information is highly variable by waste stream and across each of the major flows. In brief the following was found:

### **Adequate information in the public domain**

- Council collected refuse
- Council collected recycling
- Council operated transfer stations
- Litter and illegal dumping
- HazMobile, AgChem and transfer station drop off collections
- Council owned landfill

### **Limited information in the public domain**

- Private collected refuse (from Northern Alliance Licensing data)
- Private collected recycling (from Northern Alliance Licensing data)
- Privately owned landfill (those operating under ARC resource consents)
- Managed fills
- Waste to trade waste

### **Adequate information not in the public domain**

- Commercial sources
- Privately owned transfer stations
- Recyclable and compostable processing
- Hazardous waste processing

### **Little or poor quality information**

- Self haul activity
- Cleanfill disposal

In summary, adequate information in the public domain generally exists where councils control the activities. There is limited information on private sector collection activities – with the data that does exist mainly available to Waitakere, North Shore, and Rodney councils through their licensing scheme. Commercial operators also have adequate information on the quantities of material to landfill, transfer station, and reprocessing activities. There is a lack of adequate quality information on self haul activity and on cleanfill disposal in particular.

## 6.7 Analysis of available waste data by waste stream

The approach used to take this analysis forward was to examine key material flows in terms of the quality, reliability, and usefulness of the data that is able to be obtained. In order to do this effectively, the available waste data in relation to key targets and potential waste management objectives identified in section 6.5 was analysed. A summary of this analysis is provided below. Detail of the analysis is provided in Appendix C.

### 6.7.1 Organic

Apart from tonnages and composition of household collected waste, there is limited adequate quality information in the public domain in respect of what would be required to manage the region's organic waste streams. The key gaps in the data are:

- Tonnages and composition of material to landfill
- A lack of ongoing information on food waste collected, and limited data on commercial waste collections, including collections of garden waste, catering waste, food manufacturing waste, and organic processing wastes
- Limited information in the public domain on material deposited at transfer stations
- Participation of households in commercially provided organic waste collection services.

### 6.7.2 Construction and demolition waste

There is little adequate quality information in the public domain on construction and demolition wastes. Key gaps in the data include:

- Poor definition of C&D waste
- Quantities and composition of C&D materials collected
- Quantities of C&D material to cleanfill and managed fill
- Limited information on site practices

- Limited information in the public domain about quantities and types of C&D material diverted
- Limited information in the public domain about quantities and composition of C&D material to transfer stations and landfill.

### 6.7.3 Special wastes (oil, tyres, end-of-life vehicles, batteries etc)

There is some information about the composition and quantities of special wastes collected from households but in general the information on special wastes is limited. Key gaps in the data include:

- The composition of special wastes sent to transfer stations and landfill
- The types and quantities of special wastes diverted.
- Data on special waste generators.

### 6.7.4 Hazardous

There are adequate levels of information on household hazardous waste in terms of the amounts found in household collections and the number of people and quantities of material being collected through the HazMobile. There are, however, a number of significant gaps in the available data on hazardous waste. These include the following:

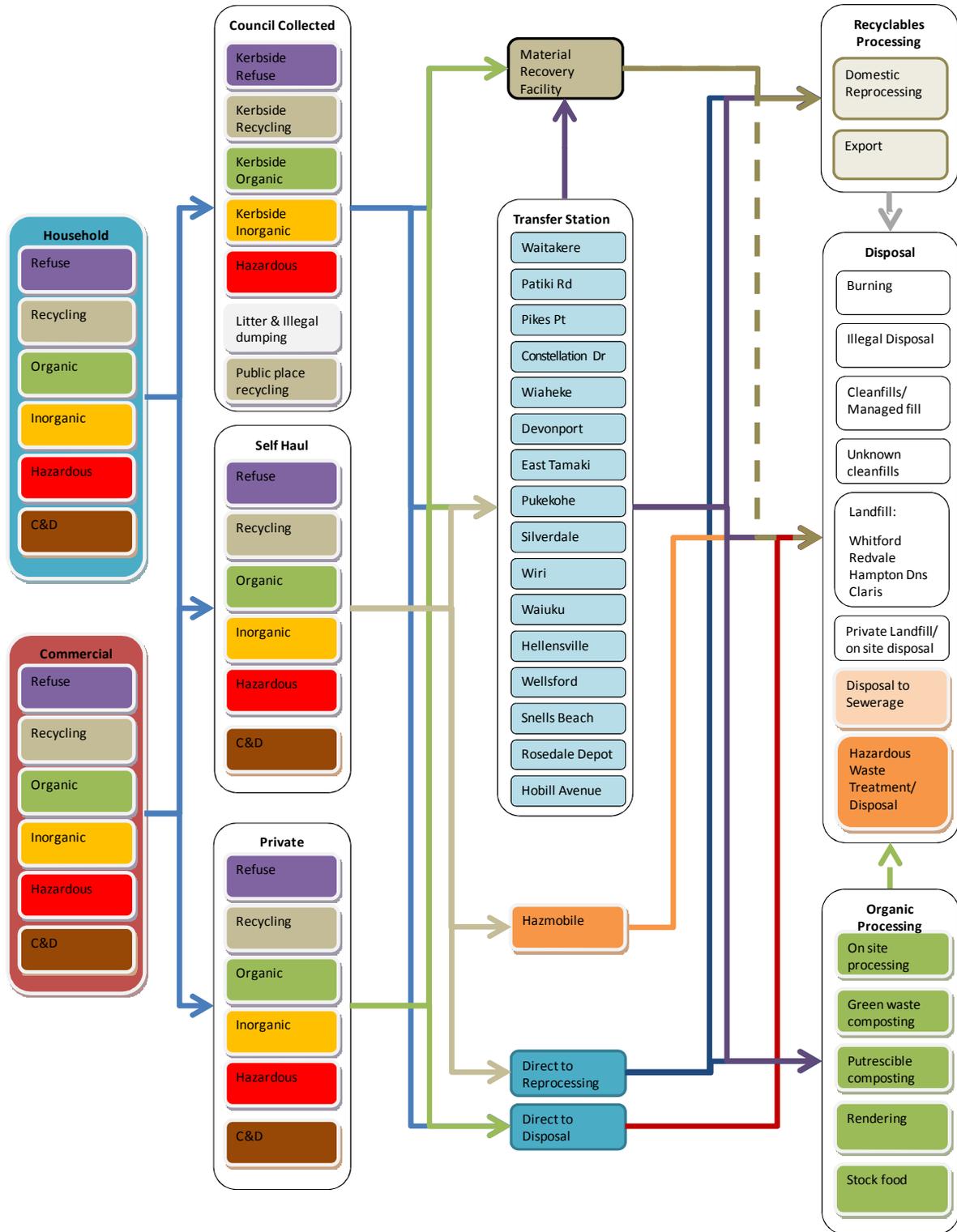
- The amounts of hazardous materials illegally disposed of
- The quantities of hazardous materials in the commercial waste streams
- The quantities and types of hazardous materials diverted from landfill disposal
- Quantities and composition of hazardous material disposed of to landfill.

### 6.7.5 Packaging and other recyclables

There is generally adequate information on this priority area with good levels of information in household collected waste tonnage and composition, and on the quantities and types of recyclable materials diverted. There are however gaps in the data including:

- Composition and tonnages of privately collected (household and commercial) wastes
- Tonnage and material types of privately collected (household and commercial) recyclables
- Composition and tonnages of event wastes
- Tonnage and material types at drop off centres.

**Figure 6.** Flow Chart of Generic Waste Flows in the Auckland Region



## 6.7.6 Inorganics

Apart from information on quantities of material collected through council inorganic collections there is limited information on this waste stream. To properly manage this stream better information would be required on the following:

- The composition of collected inorganic material (in particular information about how much is 'reusable')
- Participation data on inorganic collections
- Composition and tonnages of inorganic type material deposited at transfer stations.

## 6.7.7 Residual wastes

While the quantities of waste going to landfill from the Auckland Region are accurately measured (via weighbridge data) there are issues with monitoring and reporting on this information at a regional level. The biggest constraint on residual waste information is the difficulty in obtaining information on the quantity of waste to landfill – principally as a result of Hampton Downs being located outside of the Auckland Region. There is also limited information on the sources of material landfilled due to consolidation of loads at private transfer stations before transport to landfill resulting in a loss of source information. In particular information in the public domain on the quantity of privately collected material going to landfill is poor - the exception to this being the data collected by North Shore, Waitakere and Rodney councils through their licensing scheme.

## 6.7.8 Litter and illegal dumping

There is generally reasonable information on litter and illegal dumping as clean-up of this is controlled through councils. Not all illegal dumping, however, is reported and there is limited information on the composition of illegally disposed material and litter.

## 6.7.9 Contaminated soil

While most if not all significantly contaminated sites are noted in land-use information held by councils, low level contaminated sites are generally not tracked. In addition, there is no system in place for tracking where materials removed from a site are taken to.

## 6.8 Gaps and barriers

Our analysis has shown that the quality of information overall is patchy and the current level of data is likely to be insufficient for properly managing Auckland's waste streams into the future.

### 6.8.1 Gaps

The key gaps include the following:

- Detailed data for cleanfills and managed fills (consents)
- Composition data for cleanfills/managed fills
- Detailed data for private sector recycling/composting activity
- Access to tonnage information on material disposed of/processed out of the region
- Access to composition information on material disposed/processed out of the region
- The composition of special wastes sent to landfill
- The types and quantities of special wastes diverted
- Limited information in the public domain about quantities and types of C&D material diverted
- Limited information in the public domain about quantities and composition of C&D material to landfill.

### 6.8.2 Barriers

There are a number of barriers to obtaining the necessary information. These include the following:

- Poor definition of certain waste streams including construction and demolition waste, 'inorganic' wastes, and 'special' wastes
- Limited access to data on privately collected waste streams (outside of Northern Alliance data)
- A lack of a coordinated central repository for gathering, analysing, and disseminating waste data
- The absence of standardised waste reporting protocols or infrastructure (e.g. software)
- The transportation of materials/waste streams outside of the region for disposal or processing

- A large number of small operators (particularly in respect of collections) with a relatively high historic turnover
- The designation of cleanfilling as a 'permitted activity' in the Auckland Region resulting in a large amount of cleanfilling activity taking place outside of the regulatory framework and limiting the opportunity for data capture
- A lack of controls or incentives around management of wastes on construction and demolition sites

## 6.9 Towards a regional waste data strategy

It is suggested that the work undertaken in this report could lay the ground work for developing a regional waste data strategy. A regional waste data strategy would clearly identify the information that is needed to manage waste in the region (for which this document, it is hoped, provides some groundwork) and plot a way forward that would ensure this information is available to the necessary parties.

Available techniques for improving data quality and availability in Auckland include:

- Establishing standard waste stream definitions for the purposes of monitoring and reporting of waste data
- Extending the Northern Alliance licensing scheme (or some appropriate variant) across the Auckland Region
- Initiatives to gather data from privately-owned transfer stations. This could take the form of inclusion of waste facilities in a licensing scheme, review of the terms of resource consents to require reporting of data, or some other method such as public sector entry into strategic partnerships with transfer station owners
- Improving controls on cleanfills and managed fills, including reporting requirements, through upgrading of consent conditions or introduction of a 'cleanfill bylaw'
- Conducting regular participation surveys for key services
- Developing a structured programme of waste audits at facilities throughout the region to provide accurate meaningful time series data on key waste streams
- Introducing site waste management plans for construction/demolition sites to help track C&D waste
- Focusing targets on key metrics which are measurable. The key metrics ultimately are the quantity of waste (per capita) to landfill and the composition of this waste. If good quality data can be gathered around these measures, then determining quantities of material diverted may not be necessary in terms of formulating and monitoring waste policy and strategy in the Auckland Region.

- Establishing a centralised waste data management system with clear lines of reporting and responsibility
- Working with the Ministry for the Environment to help establish a national tracking system for all hazardous waste
- With regards to contaminated soil, developers should have a requirement for any contaminated soil removed from a site to be shown to have been taken to a licensed facility. Waste Track is an MfE tool for tracking transportation of liquid and hazardous wastes, which could be adopted to include contaminated sites.
- Established annual reporting (to be aggregated at regional level) from key recovered material processing facilities. Based on data for this project, this would likely include:
  - Living Earth Ltd
  - Envirofert Ltd
  - Eco Stock Supplies Ltd
  - Reharvest Timber Products Ltd
  - Visy Recycling Ltd
  - CHH Fullcircle
  - Owens-Illinois (NZ) Ltd

The key out of region flow that needs to be captured is waste going to Hampton Downs Landfill. This could potentially be captured through a waste operator licensing scheme. Another alternative is for the Auckland region authority to enter into discussions with Environment Waikato and Hampton Downs' operator EnviroWaste Services Ltd to investigate options around regular provision of tonnage (and composition) data for waste disposed of from the Auckland region. At present this information has been supplied on a 5 yearly basis for the purposes of the Auckland Regional Council's State of the Environment reporting, but this level of data is not sufficient for ongoing management and reporting.

In terms of delivery structures, it would make most sense for a central agency to have responsibility for gathering and analysing waste data, as this would provide an opportunity for standardisation of how data is reported and would minimise confusion caused by reporting to multiple agencies. The move to a new Auckland Council affords an opportunity to put in place appropriate structures responsible for developing a strategic approach and implementing systems for gathering and analysis of waste data

In many ways the optimum structure for gathering and analysis of waste data will be as simple as possible and gather only that information which is genuinely needed to manage waste flows. This type of approach imposes the minimum burden on waste operators and avoids the inefficiencies of having to manage large quantities of unnecessary data. In developing a waste data strategy for Auckland, it is

recommended that emphasis is placed on accurately and correctly targeting the information required.

As noted in the gap analysis, improving data in a few key areas will enable the development of credible estimates of waste quantity and composition for the Auckland Region. It is likely that an element of judgement will remain in developing an overall picture of waste management in the region at any point in time. This is due to the movement of waste in and out of the region, the difficulty in identifying and quantifying all waste from business activities and the 'informal' nature of the cleanfill disposal market.

## 6.10 Tools for Improving waste data

The Auckland councils (and the single Auckland Council in the near future) have a number of tools available to assist in assembling data on waste in the region. These include:

- Requiring the provision of data through by-laws (under the Waste Minimisation Act 2008);
- Requiring the provision of data through resource consents (under the Resource Management Act 1991); and
- Working with commercial operators to share data (potentially on a confidential basis).

The implementation of the levy component of the Waste Minimisation Act will also result in the collection of data at waste disposal facilities. Any reporting requirements under bylaws and/or resource consents should look to align with the requirements under the WMA and underlying regulations.

The data presented in this report draws on information obtained through the use of these approaches as well as information in the public domain. This has resulted in a series of estimates for key waste streams but has also highlighted some areas where a statutory requirement to provide data could improve the accuracy and relevance of the data collected.

### 6.10.1 By-Laws

There a range of refuse by-laws in place in the Auckland Region with the most recently reviewed/implemented example being that implemented jointly by North Shore City Council, Rodney District Council and Waitakere City Council. This includes the requirement to provide data and has provided reasonable quality data for that part of the region. There is potential for the new Auckland Council to adopt (with or without amendments) this by-law across the Auckland Region providing comprehensive data about the movement, disposal and processing of waste.

Key considerations for the implementation of a bylaw include

- Interaction with any resource consent requirements;
- Weighing up the cost (to businesses and the community) of implementing the bylaw with the benefits to be gained; and
- For reporting requirements, how to handle commercial sensitive information.

These issues have been considered in some detail in the supporting analysis for the existing by-law in Auckland as well as similar work for other councils in the Region (Auckland, Manukau) and in other parts of New Zealand (Christchurch City Council).

An Auckland region waste by-law would ideally:

- License transporters of waste;
- License disposal facilities (managed fill, cleanfill and landfill);
- License waste processing facilities (transfer stations, sorting facilities, processing sites); and
- Align reporting requirement with those for resource consents (where relevant)

### 6.10.2 Resource Consents

Waste disposal facilities in the Auckland region require resource consent from the Auckland Regional Council. All of the major facilities are required to provide information on quantity of materials accepted but the brief review of consent records suggests that for Managed Fills and Cleanfills this data is not always provided. Landfills in the Auckland Region are required to undertake periodic waste composition surveys. There is potential to extend this requirement to managed fills, most logically with a simplified methodology based on a reduced number of categories.

Consents for waste disposal facilities in the Auckland Region would ideally

- Require regular reporting of waste quantity, including identifying any out of region waste;
- Require periodic reporting on waste composition; and
- Align reporting requirements with those for by-law s (where relevant).

### 6.11 Regional Waste Data Strategy Outline

The development of a comprehensive understanding of waste management in the Auckland Region including time series data where relevant is a complex and long term exercise. Previous work focussed on municipal landfill disposal (quantity and composition) provides useful historical data. The estimates presented in the report broaden the scope of the data set but provide information at a single point in time. A regional waste data strategy should aim to build on the work completed to date and enable both policy makers and those in the waste industry to follow trends over time.

An Auckland Regional Waste Data Strategy should include the following components:

- An overview of the waste management sector in Auckland;
- A summary of existing data and estimates;
- Key sources of data
  - Disposal - Landfills, cleanfills and managed fills via WMA and resource consent reporting requirements. Voluntary provision of information on a confidential basis for Hampton Downs (Waikato);
  - Diversion – processors of materials (Owens Illinois, Living Earth, EnviroFert, SteelServ, Carter Holt Harvey, Visy Recycling, TPI AllBrite, Smart Environmental, ReHarvest).
- Key metrics for waste in the Auckland Region
  - Annual
    - Waste to landfill, managed fill and cleanfill;
    - Commodities (paper, plastic, glass, aluminium/steel cans) diverted;
    - Organic waste diverted (composting, stock food, biofuel, mulch/bedding)
    - Construction and demolition waste diverted (aggregate, reuse of materials)
  - 2-3 Years
    - Composition of waste to landfill
- Key actions to improve data quality
  - Adopting an Auckland Waste Licensing By-law
  - Aligning reporting requirements for Resource Consents and Licenses (under the By-law)
  - Data Collection Programme – resourcing collection of data from license and resource consent holders
  - Annual Reporting – covering waste disposal, diversion and key changes in the waste market in the Auckland Region.

## 6.12 Recommended actions

Developing a strategy to improve data on waste in the Auckland Region would be an important step in improving waste data quality. Development of such a strategy could draw on the information presented in this report. The outline presented above notes the key components and also a number of actions that arise from the gaps and limitations in the data reviewed in preparing this report.

The recommended actions to improve data for the Auckland Region are:

- Prepare an Auckland Regional Waste Data Strategy drawing on the detailed information presented in this report and outline presented above. Any such waste data strategy should be founded on extensive consultation and should be developed in liaison with central government in order to coordinate with efforts to improve waste data quality on a national level.
- Develop an Auckland Waste Licensing By-law for consideration by the new Auckland Council. This bylaw could be based on the bylaw implemented by North Shore, Waitakere and Rodney Councils. Prior to the adoption of any bylaw there will need to be a review of the operation of the existing by-law with particular reference to the implications of expanding the scope to cover the entire Auckland Region. Following the review, and assuming the adoption of a bylaw is warranted, the Auckland Council should take the bylaw through the formal consultation process.
- Align reporting requirements for resource consents and bylaws (where relevant). While it may be that a reviewed bylaw excludes sites required to report under resource consent conditions, but in the short-term compliance costs can be minimised by ensuring that information requirements are aligned.
- Develop an integrated data collection programme that coordinates the collection and collation of data required through licensing or resource consents with and data provided on a voluntary basis. The focus of the programme should be on minimising the cost of providing data while ensuring that those obligated to provide data are doing so.
- Provide annual reports on waste in the Auckland Region including quantity and composition of waste disposed of to landfill, quantity of waste diverted from landfill and any changes to the waste market (structure, ownership, services available) in the Auckland Region.

# 7 Issues and Opportunities

## 7.1 Introduction

When considering the issues and opportunities for enhancing waste management in the Auckland Region, it is worth briefly restating the context of this report. This work has been undertaken during a period of significant change in the governance of the Auckland region, with amalgamation of the Regions' seven Territorial Authorities and one Regional Council into a single Unitary Authority due to take effect by 1 November 2010. In addition, the stocktake document is being written at a time when the newly-enacted (September 2008) Waste Minimisation Act 2008 has created a new legislative environment for the management of waste, which includes: a levy on waste disposed of in landfill (with the distribution of the levy funds through a Waste Minimisation Fund); a requirement for councils to have a Waste Management and Minimisation Plan in place by July 2012; and provisions for product stewardship schemes that could address specific waste streams. Further drivers for change in the sector are also expected from the revision of the National Waste Strategy targets, which are expected to be announced towards the end of 2009. The new Auckland Council will need to manage waste with objectives relating to the meeting of these new targets.

Collectively these changes represent some significant challenges, but also a corresponding set of opportunities. This section considers some of the key issues and opportunities that have become clear from analysis of the information gathered in this stocktake.

It should be noted that the issues and opportunities put forward here are presented from the perspective of the objectives of this stocktake. They are not intended to be an exhaustive inventory, nor is this section intended to be a strategic analysis of the best way forward, or an assessment of how competing imperatives may be balanced. This will clearly be a task for the authors of a future Waste Assessment and Waste Management and Minimisation Plan for Auckland.

## 7.2 Analysis

Key issues and opportunities identified in the stocktake are noted in the following areas:

- Landfill Disposal
- Residual Waste Treatment
- Cleanfill
- Bulking and Transfer

- Collection Market
- Data
- Recovery

These are discussed in the following subsections.

### 7.2.1 Landfill Disposal

There are a number of features of the Auckland landfill disposal market that are worth commenting on. In the first instance, the two major landfills servicing the Auckland Region, Redvale and Hampton Downs (which together account for over 85% of current disposal capacity) are each located some distance from the major metropolitan area, with Redvale to the north and Hampton Downs to the south. This means that the need for bulk haulage of waste is a feature of waste management in the region and one that needs to be looked at more closely in terms of transport efficiencies and the current transport mix. This is discussed further in section 7.2.4.

A second important feature is the shift over the last 15 years from a larger number of public sector-owned and -operated landfills to a smaller number of larger, predominantly private sector-owned landfills. This shift has been brought about in large part by the RMA requiring much higher standards of landfill engineering and management. This altered the economics of landfilling and has meant that larger facilities are required to achieve sufficient economies of scale. At these scales, the private sector has been better structured to build, finance, and operate these facilities. The private sector, however, has a different set of imperatives to the public sector. While the public sector may consider a landfill to be an asset, the life of which should be prolonged into the future, and the return on which may be balanced against issues of public good (such as increasing waste diversion), the private sector needs to provide return on investment in its asset, and this is likely to be a key consideration in their management of the asset. This means that the sooner the landfill can be filled up the sooner the investment can be repaid. Private sector landfill operators therefore have a natural driver to secure as much waste tonnage as possible. One effect has been landfill companies attempting to secure tonnage through offering long term disposal contracts.

The existence of two competing private sector landfill operators serving Auckland has resulted in a competitive waste market for landfill disposal in the Auckland region. This has had a number of impacts. On the one hand it has likely resulted in a constraint on disposal prices. While this is positive in terms of short term costs to business and councils, it results in reduced incentive to divert materials, and has most probably constrained the development of diversion infrastructure. Competition has also incentivised the vertical integration (i.e. collection, transfer, and disposal) of waste companies, with the two large waste companies competing for 'flow control' in an effort to secure waste quantities.

A further issue in respect of landfill is the issue of capacity into the future. Hampton Downs is estimated to have capacity for a further 35 years, and Whitford has recently

had consents reissued until approximately 2040<sup>36</sup>, However the other major landfill Redvale, has a more limited life, with the landfill set to close when its consents expire in 2023. If there are to be any replacements for the Redvale facility, planning should realistically commence as soon as possible.

Due to this competitive marketplace, a large proportion of which is privately owned and controlled, there will be limited opportunities for the Auckland Council to influence the management of the Region's landfills in the long-term interests of the Region's residents, or in such a way as to meet the Council's other waste management objectives.

## 7.2.2 Residual Waste Treatment

The introduction of the Waste Levy and the NZ Emissions Trading Scheme (ETS) raise the prospect of residual waste treatment technologies being employed to reduce tonnages to landfill. As is noted in section 2.3.2, the method for calculating emissions from landfills and incinerators is yet to be regulated<sup>37</sup>. While this means it is not yet possible to calculate the impacts from the ETS, as with the Waste Levy, the net impact of the ETS on the waste sector is likely to be to increase the cost of landfilling. These increased cost drivers could serve to incentivise the introduction of residual waste treatment technologies.

Residual waste treatment technologies include incineration, Mechanical Biological Treatment (MBT), autoclaving, gasification & pyrolysis, and other Advanced Thermal Treatments (ATT). At the simplest level landfill operators could have incentive to separate out and divert recoverable materials such as metals, C&D waste, or homogenous loads after they have passed over the landfill weighbridge. These technologies all serve to reduce the volume of wastes that require landfilling, and can also reduce the biodegradability – potentially reducing the production of leachate and greenhouse gases from landfill. Residual waste treatment technologies are well established in mainland Europe and to a lesser extent the UK, but have yet to make a significant impression (outside of specialist applications) in NZ. The principal reason for this is that the relatively low cost of landfill in NZ means most of these technologies would not be financially viable. On its own, the current landfill levy of \$10 per tonne is unlikely to be sufficient to ensure viability of alternative treatment technologies but if the costs of landfilling were to increase significantly this could change.

## 7.2.3 Cleanfill

Cleanfilling in the Auckland Region is a Permitted Activity, subject to conditions, under the Auckland Regional Air, Land and Water Plan. The relative lack of controls on cleanfilling activity has resulted in considerable uncertainty around the level of cleanfilling activity and management practices. There is a danger that materials that should be placed in a sanitary landfill (e.g. contaminated soils), or could be recovered is, in effect, may be disposed of illegally at cleanfill sites.

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<sup>36</sup> Whitford has a restriction on vehicle movements which effectively limits tonnage to 200,000 tonnes per year

<sup>37</sup> The expectation is that Government will work with industry to do so during 2009 and 2010

The presence of these unregulated disposal sites means that increases in the cost of disposal (e.g. through the Waste Levy), rather than incentivising diversion, could potentially incentivise illegal disposal. Gaining control over these sites (and accessing data on what is deposited in the sites) will be important if diversion is to be properly encouraged and negative environmental effects are able to be controlled by the Auckland Council in the future.

There are two main avenues through which an Auckland Council could improve management of cleanfills: enhancing the controls under the RMA, or; introducing a bylaw to regulate the operation of cleanfills in the region. Each of these approaches is likely to have particular strengths and weaknesses, with an RMA centred approach being more streamlined, while a bylaw approach may provide greater flexibility and ease of implementation.

A further possibility is that central government may introduce a National Environmental Standard (NES) covering the operation of cleanfills<sup>38</sup>. However, there is no certainty that an NES will be drafted.

## 7.2.4 Bulking and Transfer

The bulking and transfer infrastructure is in many ways the backbone of the waste infrastructure in Auckland, and is the key to control of waste as it is the conduit through which the majority of collected material flows on its way to either recovery facilities or disposal. As noted in s 3.1.2, the majority of transfer stations on Auckland's central 'spine' are controlled by either of the two major waste management companies, with outlying facilities generally in council or smaller operator control. The overall level of council ownership/control of these facilities is therefore very limited.

Given the vertical integration of the landfill companies and the competition for tonnage, there is at present insufficient commercial incentive for the privately-owned facilities to invest in maximising resource recovery from the waste streams they control. Although the new NZ Waste Strategy targets have not yet been released, maximising resource recovery from these facilities will be essential if those targets are to be met.

Under the current arrangements, the Auckland Council will have little influence over the operation of these facilities. If greater recovery of resources is to occur, changes to the current arrangements may be necessary. Changes could take the form of alterations to the existing ownership and control structures, such as establishment of a measure of Local Authority ownership and/or control of key facilities (for example through some sort of public/private partnership arrangement). Alternatively, the legal and financial structures that are in place could be adjusted to incentivise recovery of materials. This could be achieved through increasing the costs of disposal (such as through the landfill Levy, and/or ETS), licensing of facilities and operators, the introduction of landfill material bans, and/or financial incentives that are put in place to optimise recovery.

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<sup>38</sup> This possibility has been signalled in the MfE's March 2009 Discussion document: Waste Minimisation in New Zealand - A discussion document from the Ministry for the Environment (Target 12)

In addition to the above, this report also notes significant issues in respect of collection and transfer inefficiencies. These issues are two-fold:

The haulage of waste across Auckland – with TPI-controlled waste streams heading north to Redvale Landfill and those controlled by EnviroWaste going south to Hampton Downs. At present a significant proportion of these transfer issues are taken care of through a 'tonnage swapping' arrangement between the northern and southern-situated transfer stations controlled by the two companies,

The waste swapping arrangement is based on a commercial agreement between the two companies involved, but has strategic implications for the region. Changes to this arrangement, for whatever reason, could lead to increased bulk haulage movements and the associated negative environmental impacts.

Collection vehicles from TPI and EnviroWaste tip at their own company's transfer station to take advantage of lower disposal costs. This results in collection inefficiencies, leading to additional traffic congestion and greenhouse gas emissions as well as adding to collection costs. There is clearly potential to rationalise these collection logistics if a suitable working arrangement can be arrived at or suitable incentives put in place through legislative means.

The issue of transportation of waste is particularly pertinent in the Auckland Region as Auckland has significant transportation / congestion problems, which create inefficiencies not only in the waste transportation industry but to the wider Auckland and New Zealand economy. The existing rail network, with the main trunk lines location near key refuse transfer stations and the Hampton Downs Landfill does provide opportunities for transportation with associated efficiency gains. As long as waste and diverted materials are required to be moved significant distances, there will be transportation issues and this means that long term solutions to haulage will be important.

## 7.2.5 Collection Market

There are two elements to the collection market – council controlled/contracted collection services and private collection services.

In terms of council collection services, a move to a single authority could bring potential for harmonisation of collection systems, and potential for collection efficiencies through integration of contracts, redrawing of collection rounds, and other means. Some caution needs to be applied in this respect, however. If contracts become too large it could limit competition between service providers and may not result in efficiencies being realised.

The private collection market, as is noted in this report, has relatively low barriers to entry with a large number of smaller collection businesses operating. These smaller operators are at a disadvantage relative to the two large waste companies that may be able to take advantage of lower disposal prices through vertical integration. The level of competition in the waste collection sector is also likely to impact on companies offering separate collection of recyclable materials, as recycling companies must

compete not only with other recycle collectors but with the relatively low cost of waste collection and landfill disposal.

## 7.2.6 Data

Section 5 of this Stocktake report provides an analysis of the issues surrounding waste data. It is noted that there are significant gaps and barriers in the gathering of waste data on a regional basis at present. Some of these key gaps and barriers identified include:

- Limited quantity and composition data for cleanfills and managed fills
- Limited data for private sector recycling/composting activity
- Limited access to data on privately collected waste streams
- Lack of consistent access to tonnage and composition information on material processed or disposed of outside the region
- Lack of information on the composition and quantities of special wastes sent to landfill and diverted
- Limited information in the public domain about quantities and composition of C&D material generated, diverted, and sent to landfill
- A lack of a coordinated central repository for gathering, analysing, and disseminating waste data
- Poor definition of certain waste streams including 'construction and demolition waste', 'inorganic' wastes, and 'special' wastes

There are clear opportunities to improve the gathering, analysis and dissemination of waste data. Many of these opportunities may be outside the scope of the authority of the Auckland Council. However, it will be essential for these opportunities to be realised if meaningful and measurable waste targets and to be set and monitored by the Auckland Council.

## 7.2.7 Recovery

A significant portion of the waste stream is still disposed of to landfill. Opportunities for recovery are dependent on a combination of factors including:

- Diminishing returns. Across recovery operations we are aware of, recovery rates tend to plateau between 60 and 80%. If this level of diversion is already being achieved, capturing the remaining materials is likely to be challenging.
- The quantity of materials available for diversion. Many recycling or diversion activities rely on economies of scale for financial viability. A significant quantity of materials is more likely to justify in capital investment and market development.

- The cost of recycling/recovery compared to disposal. This is particularly relevant where waste recovery is undertaken by the private sector, as there must be a clear financial return for engaging in recovery as opposed to disposal.
- The availability of stable markets for materials. As noted earlier in section 6.4.1, market factors are a key driver for the recovery of materials and an essential component for recovery of value. A lack of sufficient demand will ultimately hamper attempts at recovery of any material stream.
- The availability of existing technology or systems to recover materials. There are technological solutions for the recycling or recovery of most waste streams. There are also numerous examples of complex technical solutions struggling to operate effectively due to technical and financial challenges.

The analysis undertaken in this Stocktake report identifies a number of key waste streams that have the potential for higher levels of diversion. Figure 7 and Table 13 illustrates the quantities of materials that are current landfilled, cleanfilled, and diverted. This highlights where the biggest opportunities for increasing diversion are. The largest waste streams that could be targeted for recovery include: C&D waste, contaminated soil/sludge, other organic, paper waste, plastic wastes, and green waste. The potential for recovery of these waste streams are discussed briefly in the following subsections.

### **Organic waste**

There are three key organic waste streams that are the main targets for increased recovery, green waste, household food waste, and commercial food waste (in particular catering waste). Organic waste, in particular food waste, is the largest remaining fraction of the domestic collected waste that has not yet been targeted for diversion. In addition, there are still significant quantities of organic material from commercial sources that could be diverted and put to beneficial use.

There is significant ongoing work being undertaken by the territorial authorities to address both the household and commercial streams. The Auckland Waste Officers Forum, Organic Waste Working Group has undertaken work on technology options for managing organic waste and organic waste collection from households. The outcomes of this work suggest that if sufficient scale is able to be achieved, composting of household organic waste could be cost competitive with landfill disposal. Work by Enterprising Manukau on diversion of industrial and commercial food waste has highlighted that a large amount of food processing waste is already diverted, largely for processing as stock food. The data collected for this report highlight that opportunities remain to increase the proportion of other organics diverted with key sources likely to include households and commercial kitchens (hospitality and institutional). Key challenges in this regard include developing cost effective collection systems and encouraging the introduction of technology capable of processing putrescible waste.

**Table 13** Proportion and Quantity of Key Waste Streams disposed of to landfill

| Waste Stream        | Diverted Tonnage |           | To municipal landfill, cleanfill and managed fill |                       |                            |                                |
|---------------------|------------------|-----------|---|-----------------------|----------------------------|--------------------------------|
|                     | %                | T/yr      | %   | T/yr to all landfills | T/yr to municipal landfill | T/yr to cleanfill/managed fill |
| Green Waste         | 43%              | 82,000    | 57%   | 110,600               | 80,000                     | 30,600                         |
| Other organic waste | 43%              | 140,000   | 57%   | 187,000               | 187,000                    | -                              |
| C&D Waste           | 36%              | 430,000   | 64%   | 772,000               | 313,000                    | 459,000                        |
| Rubble              |                  | 400,000   |   | 121,000               | 121,000                    |                                |
| Timber              |                  | 30,000    |   | 192,000               | 192,000                    |                                |
| Paper               | 52%              | 160,000   | 48%   | 145,000               | 145,000                    | -                              |
| Metal               | 74%              | 184,000   | 26%   | 66,000                | 66,000                     | -                              |
| Plastics            | 8%               | 11,000    | 92%   | 124,000               | 124,000                    | -                              |
| Textiles            |                  | 0         | 100%  | 42,000                | 42,000                     | -                              |
| Glass               | 68%              | 68,000    | 32%   | 32,000                | 32,000                     | -                              |
| Other               | 47%              | 592,000   | 53%   | 668,000               | 408,000                    | 260,000                        |
| Soil/inert          |                  |           | 100%  | 1,040,400             | -                          | 1,040,400                      |
| Total               |                  | 1,667,000 |   | 3,187,000             | 1,397,000                  | 1,790,000                      |
| Percent             | 34%              |           | 66%   |                       | 44%                        | 56%                            |

Notes: The percentage and tonnage disposal figure is based on municipal landfill waste composition figures (Section 4.2), estimates of green waste (2%) and C&D waste (30%) to cleanfills and data on sludge and contaminated soils to managed fills.

Key to the recovery of organic material will be ensuring there are processing facilities capable of accepting the separated organic wastes at a price that is competitive with landfill. There will also be a need for bulking and transfer facilities capable of handling putrescible material.

As with all diverted materials, viable markets for the recovered material will be critical. Up until the present, the diversion of organic waste from the municipal stream in particular has been driven by waste minimisation efforts while demand for the products of the process has tended to lag behind. This has meant relatively low prices and the need to rely on gate fees to ensure economic viability of the facilities. Diversion of greater levels of organic wastes would result in substantial additional tonnages (potentially in the order of 50 – 70,000 tonnes per annum) requiring markets, and work would be essential to develop these markets to ensure the material is put to beneficial use.

As is being shown by territorial authorities at present, the Auckland Council is likely to have the ability to be able to exert considerable influence over the recovery of this waste stream.

## **C&D Waste**

In tonnage terms, C&D waste is estimated to be the largest stream of material that could be diverted. The estimate of the total quantity of C&D waste disposed of is subject to significant uncertainty due to the lack of information for cleanfills and managed fills. However there is clearly a significant amount of C&D waste disposed of to landfill and opportunity to reduce the disposal of this material through supporting existing diversion activity. Much of what is identified as C&D material is currently sent to cleanfill and so efforts that target this material for recovery will in part depend on what controls are in place around cleanfills.

Specific opportunities relate to increasing the processing and use of recycled crushed concrete and the re-use of untreated timber.

While materials such as crushed concrete have existing uses, other materials such as plasterboard and treated timber are more problematic and will require research and the development of processing infrastructure and markets before recovery will be viable. There are emerging initiatives for the diversion of clean plasterboard (ex manufacturing and potentially construction off-cuts) but these rely on establishing an effective logistics chain from building sites to processors. The Ministry for the Environment is working with the construction industry to increase the diversion of waste. Key drivers in Auckland for the diversion of C&D waste include the trend to seeking Green Star accreditation for new buildings and refurbishments, the market for recycled aggregate, and the rising cost of landfill disposal.

## **Sludge/contaminated soil**

Sludge/contaminated soils make up a significant portion of materials disposed of to landfill. There is currently a lack of detailed information on the composition and origin of these materials, which restricts any analysis of potential for improving diversion. One issue which it will be important to address is the issue of contaminated soils that are currently being sent to cleanfill. There may be opportunities to put biosolids to beneficial use through processing in composting or anaerobic digestion facilities. Facilities capable of processing biosolids do not currently exist in the Auckland region and if biosolids are to be targeted for diversion it would be important that this is identified early in the design and procurement of any new regional composting facilities.

## **Paper/Cardboard**

Although there is a well established paper and cardboard collection and processing industry, waste composition analyses indicate that there are still large quantities of potentially recoverable materials being landfilled. This issue is likely to require further analysis, but achieving higher levels of diversion may well require addressing the price structures around landfilling or introducing legislative measures to provide greater incentive for recovery. The Auckland Council's ability to take direct action on improving recovery of this material will be limited.

## Plastics

Over 90% of plastics are disposed of to landfill, suggesting there is significant opportunity to increase recovery and recycling. Plastics have been one of the last commodities to be addressed in terms of diversion. This is largely due to the sensitivity of plastics to contamination and unfavourable collection and transport logistics as a result of their light weight. Aside from HDPE, there are limited domestic markets for plastics, meaning most recovered plastic is sold on international commodities markets. In the short term the key to increasing diversion is likely to lie in improving separation and quality of recovered materials to access higher value and more stable international markets.

Taking a slightly longer term view, there may be scope to further develop local processing infrastructure to enhance diversion. Issues that have been identified during the preparation of this report include:

- Limited local capacity to process the range of plastics currently in the waste stream;
- Limited local capacity to handle products containing mixed plastics;
- Limited interest in processing ;'dirty' plastics e.g. from food containers;
- Washing infrastructure.

There has been a significant amount of work exploring opportunities to increase the recycling of plastics, including development of the Packaging Accord and a wide range of initiatives by Plastics NZ. In both cases, work has included design issues being addressed (materials selection, easy deconstruction/disassembly) and looking to increase options for the recycling of plastics once they become waste.

In the short term, there would be benefit in discussing opportunities to work with the plastics industry and waste collectors to reduce the amount of plastics disposed of to landfill. Where tangible opportunities become apparent, there may be a case for accessing Waste Levy funding to undertake research, feasibility studies or project development.

## Special Wastes

Special wastes' include used oil, tyres, end of life vehicles, batteries and electronic goods. As with hazardous wastes they can cause a disproportionate level of harm if not properly managed. A number of these wastes are candidates for product stewardship schemes. Some are already the subject of voluntary industry initiatives, but these voluntary schemes generally do not have comprehensive coverage or target a full range of materials or sources. There are likely to be significant opportunities to enhance the capture and diversion of special wastes from landfill through mandatory and/or further voluntary product stewardship schemes. However, if national product stewardship schemes do not eventuate, the burden of waste management and minimisation will remain with Territorial Authorities.

## Hazardous

Hazardous waste is of particular concern due to the disproportionate level of harm it is capable of causing. There is a lack of good quality information on the movement and handling of hazardous wastes in the Auckland region. This situation is not unique to Auckland, however, with Ministry for the Environment recognising the issue in their March 2009 consultation document. In that document they propose two specific targets aimed at improving information and regulatory standards for the storage, transport, recycling, recovery, treatment and disposal of hazardous wastes.

## 7.3 Discussion and Conclusions

A number of key themes emerge from this analysis of the information compiled for the Stocktake report. The first of these is that the quantity of waste being disposed of from the Auckland Region could be significantly reduced, which would have the effect of increasing the longevity of existing landfills, moving toward meeting NZ Waste Strategy targets, and using resources more efficiently. However, the overall ownership and operational structure of the waste market in the Auckland Region is not conducive to the maximisation of waste diversion, either by the waste operators themselves, or by the new Auckland Council. The current structure has also resulted in a number of inefficiencies in the current waste market, particularly around the transfer of waste.

A second theme that emerges is that, in regard to waste, a clear strategic direction across the region is imperative for Auckland. Many of the issues that have been identified will require addressing within a more cohesive strategic framework than has been in place up until now. It is acknowledged that there have been attempts to bring this about, and that there is a broad desire to do so, however actually having such a strategic framework in place will be essential to meet the purpose of the WMA (2008).

A final and related thread to emerge from the analysis is the challenge faced by TAs and the future Auckland Council in gaining more influence over waste material flows in the region. The evolution of current governance structures has resulted in the Auckland region TAs having limited tools with which to effectively influence the direction of waste management in the region. This has resulted in a focus by TAs on the council-collected waste streams over which they have the most control, but which ultimately account for only about 10% of the total waste and diverted material flows<sup>39</sup>. From a strategic perspective this is clearly a significant issue that limits the ability of the councils – and potentially the future Auckland council – to manage waste in the region.

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<sup>39</sup> Data collected for this report suggests that in the region there is in the order of 4.85 million tonnes of material that is sent to landfill, cleanfill or is diverted. Of this, the territorial authorities control in the order of 450,000 tonnes through council kerbside domestic refuse and recycling collections (including inorganic collections, litter and illegal dumping) and council owned transfer stations.

For Auckland to be able to achieve the objectives of the Waste Minimisation Act and meet the intent of the NZ Waste Strategy, it will be essential that these shortcomings are addressed. It is worth noting that Auckland's ability to do this will also have implications at the national level. Addressing the shortcomings noted in this report is likely to require not only that a strong strategic direction be set through the WMMP process, but that the new Auckland Council have in place appropriate structures for the effective management of waste within the region.

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# Appendix A: Detailed assessment of data availability

## Key to Data Availability Symbols



Good quality information in the public domain



Good quality information but not in the public domain



Limited information in the public domain



Poor quality information or no information

## Organic

| Waste Data area | Data required for measurement                | Availability of Data | Notes   | Discussion/Recommendations   |
|-----------------|--|----------------------|---|--|
| Organic         | Total waste to landfill from Auckland Region |                      | <p>Landfill data from Whitford is currently in the public domain due to the JV between MCC and TPI.</p> <p>Claris landfill is owned by Auckland City Council but has no weighbridge and data is limited.</p> <p>Redvale Landfill is required to supply annual tonnage and composition figures to ARC as part of its consents.</p> <p>Material going to Hampton Downs in the Waikato is not in the public domain - it is not required to supply this information as part of its consents. Information on tonnages from Auckland is provided to ARC for its 5 yearly stocktake.</p> | <p>MfE is now collecting landfill tonnage information through the landfill levy. It is not yet clear how this information will be used or what may get passed on to local authorities</p> <p>Knowing the total waste to landfill from the Auckland Region is one of the most fundamental metrics for effective management of waste in the region. The key barrier at present is the lack of information on material going to Hampton Downs. If this information does not become available via the landfill levy process it may be worthwhile the Auckland Council entering discussions with Hampton Downs owners Envirowaste to access the information on an annual basis.</p> |

| Waste Data area | Data required for measurement   | Availability of Data   | Notes   | Discussion/Recommendations  |
|-----------------|---|--|---|---|
|                 | Composition of organic waste in the residual (compostable green waste; non compostable green waste; food waste; other compostable; other non-compostable organic) |   | <p>Redvale conducts waste composition analyses of landfill material every 3 years. This information is supplied to ARC &amp; is in the public domain. Composition is broken down into Green, Food, and Other.</p> <p>Whitford conducts waste composition analyses of landfill material every 5 years. This information is supplied to ARC &amp; is in the public domain. Composition is broken down into Green, Food, and Other.</p> <p>No composition information is supplied from Hampton Downs</p> <p>Regular composition analyses are not conducted at Claris landfill, but there is some historical information.</p> | <p>When sludges and contaminated soils are accounted for composition to landfill is generally quite consistent. Current information is probably sufficient to give a useful indication of proportions however the large intervals between data means that trends and changes resulting from altered management practices cannot be meaningfully tracked.</p> <p>Current classifications do not identify proportions of organic material that cannot be composted (eg. Flax, cabbage tree, bamboo).</p> <p>More regular composition analyses should ideally be negotiated as part of landfill resource consent conditions (at least bi-annually)</p> |
|                 | Tonnages of green waste diverted  |  | <p>There is good private sector information on tonnages of green waste accepted at composting facilities.</p> <p>Living Earth has made figures available on a one-off basis.</p> <p>There is some information available from council controlled transfer stations on green waste quantities – this provides indicative data which can be extrapolated to the waste stream as a whole.</p>   | <p>Information on tonnages of organic wastes may be available through resource consent information</p> <p>In general the quantity of materials is probably fairly well understood by the private sector but because much of this information is 'commercially sensitive' then the picture in the public domain is relatively patchy. Periodic studies or waste assessments provide reasonable one-off information but this is likely to be insufficient for ongoing management purposes</p>   |

| Waste Data area | Data required for measurement            | Availability of Data  | Notes   | Discussion/Recommendations   |
|-----------------|--|---|---|--|
|                 | Tonnages of food waste diverted          |    | <p>Information on tonnage of food waste diverted is held by private operators with one operator (Eco-Stock supplies) responsible for a large proportion of the current food waste diversion.</p> <p>Information on other diversion outlets is fractured.</p> <p>A recent study by Enterprising Manukau has provided some one-off indicative data from the food and beverage and catering sectors.</p> | <p>The level of information in quantities of food waste diverted is relatively poor. Currently no mechanisms exist to collect this information on an ongoing basis.</p> <p>Licensing of collectors/and or facility operators may be one method of obtaining this data.</p> |
|                 | Tonnage of other organic diverted        |    | <p>Other diverted organics includes industrial process wastes, material for rendering, biosolids etc. Some of this information (e.g. biosolids) is in the public domain. Other information is held by different parties and generally not gathered.</p>   | <p>Some further work in required on determining what streams should be included in waste data, and how this could be gathered.</p>   |
|                 | Composition of household collected waste |  | <p>All TA's in the Auckland region collect regular information on the composition of household collected waste.</p> <p>The composition of private wheelie bin collections is not in the public domain however.</p>  | <p>Private wheelie bins are likely to have different composition to council collections. Private services are usually contracted where waste volumes in a household are high. This may reflect lower levels of recycling and/or composting by the household</p>            |
|                 | Tonnages of house collected waste        |  | <p>All TA's have good information on the tonnages of waste collected by council contractors.</p> <p>There is limited information on quantities of private bin waste. The Northern Alliance (Nth Shore, Waitakere, Rodney) get information</p>   | <p>The quantity of material collected by private bin services varies by council according to the nature of the collection service provided. Estimates can be made based on participation data.</p> <p>Extending the northern alliance</p>                                  |

| Waste Data area | Data required for measurement            | Availability of Data  | Notes   | Discussion/Recommendations   |
|-----------------|--|---|---|--|
|                 |  |   | from their licensing scheme.  | licensing scheme may yield useful information on total tonnages of household waste collected   |
|                 | Tonnages of organic waste collected      |    | <p>Garden bag operators have good information. Two operators, Sunshine and Greenfingers control the majority of the market. Greenfingers are happy to provide regional data and estimate they hold about 45% market share.</p> <p>The Northern Alliance collects data from garden bag operators and this is in the public domain</p> <p>Transfer stations and organic waste processors also collect data on tonnages of organic waste delivered by garden bag operators</p> | <p>Data on quantities of organic waste collected is variable.</p> <p>If council collections of organic waste are initiated this will significantly improve capture of this data.</p> <p>Extending the northern alliance licensing scheme may yield useful information on total tonnages of organic waste collected</p> |
|                 | Composition of organic waste collected   |    | <p>Organic waste separately collected from households is garden waste</p> <p>There is limited information on the composition of organic wastes collected from commercial operations</p>   |  |
|                 | Participation data                       |  | Councils periodically collect participation data but this appears to be on a relatively infrequent and ad-hoc basis.  | Participation data will be critical if a new organic waste collection service is introduced.   |
|                 | Tonnages of commercial waste to landfill |  | Information on the source of material going to landfill is patchy as many loads originate at transfer stations or contain waste from a variety of sources   |  |

| Waste Data area | Data required for measurement                      | Availability of Data  | Notes  | Discussion/Recommendations   |
|-----------------|--|---|--|--|
|                 |  |   | Transfer station surveys can reveal information on the source of loads entering transfer station which can then be applied to material taken to landfill                 |  |
|                 | Composition of commercial waste to landfill        |    | Composition of commercial waste going to landfill is provided through transfer station surveys.  |  |
|                 | Tonnages of material separated at transfer station |    | There is good information from council controlled facilities.<br>Non-council controlled facilities will gather the information but it is not in the public domain        | Material from transfer stations will go to one of a limited number of processing facilities. These facilities will note where the material originates from and this may be a better avenue from which to source separated organic waste data |
|                 | Tonnages of residual waste at transfer station     |    | There is good information from council controlled facilities.<br>Non-council controlled facilities will gather the information but it is not in the public domain        |  |
|                 | Composition of transfer station waste              |  | Waitakere City conducts regular analyses of transfer station waste<br>There is limited information on the composition of transfer station waste from the private sector. | A regular programme of composition analyses across a range of transfer stations may be useful for identifying where greater levels of source separation could be undertaken.   |

Apart from tonnages and composition of household collected waste there is limited good quality information in the public domain in respect of what would be required to manage the regions organic waste streams. The key gaps in the data are tonnages and composition of material to landfill, a lack of ongoing information on food waste collected, and limited data on commercial waste collections.

## Construction & Demolition

| Waste Data area | Data required for measurement  | Availability of Data  | Notes  | Discussion/Recommendations   |
|-----------------|--|---|--|--|
| C&D             | Quantities & composition of C&D material collected   |    | The quantities of C&D waste collected will be recorded by the private sector operators, but few know the composition of the material they collect, nor keep records.   |  |
|                 | Quantities & composition of C&D material deposited at transfer stations  |    | Quantities are recorded when C&D material is deposited at a Council-owned transfer station and available. Other transfer stations will record this information but it is not accessible. Councils control Waitakere, Waiuku, Waiheke and Helensville Transfer Stations. Information on weighbridge tonnages is provided as a part of Council collection contracts. Rodney DC can access data on tonnages via licensing provisions. | The reliability of this data depends on the definition of 'construction and demolition waste' and how this definition is applied by transfer station operators.              |
|                 | Quantities of C&D material diverted (concrete, brick, rock, soil, asphalt, glass, timber, steel, aluminium, plastic wrap, plastic piping, etc) |   | The larger C&D operators have estimates of the composition of the C&D material they have diverted, and of composition. However these are only for the larger operators, and are only estimates.  | The only way to obtain reliable information about C&D material diverted is through a site waste management plan system; where the information is recorded at the site level. |
|                 | Quantities & composition of C&D material deposited at landfill   |  | Landfill operators will record the amount of C&D material deposited at their landfills. Composition data is much less common, and if available will usually be only a snapshot.<br><br>Auckland has tonnage info from Claris & MCC from Whitford<br><br>information on weighbridge tonnages  | As above.  |

|   |   |   |           |
|---|---|---|-----------|
|   |   | <p>is provided as part of collection contracts</p> <p>Rodney DC can access collection data via licensing provisions</p>   |           |
| Quantities & composition of C&D material deposited at cleanfill/managed fill        |    | Very little information exists regarding cleanfills in the region, and only slightly more for managed fills. In many cases cleanfills are short-term operations while a construction site is filled to the required profile.  | As above. |
| Mass balance of building materials  |    | Although mechanisms exist to calculate this type of measure, (eg WRAP in the UK) the information required to do so is not available here.   | As above. |
| Information on construction sites/C&D operators??                                   |    | All construction sites are required to have a building permit, so the numbers of sites will be known by local authorities. However this information has only limited usefulness given the variety in scale of construction projects. C&D operators have been identified during the course of this work, but the final destination of the material is not known. | As above. |
| Information on waste generation flows to help target facility location and capacity |  | The main C&D waste operators can provide anecdotal advice on waste generation flows. However if a facility were intended to capture the material resulting from small scale construction projects, then this may be better provided through analysis of building permits issued by local authorities.   | As above. |

## Special Wastes

| Waste Data area                                | Data required for measurement                                 | Availability of Data  | Notes  | Discussion/Recommendations  |
|--|---|---|--|---|
| Special waste (Oil, tyres, ELVs Batteries etc) | Quantities of special wastes sent to landfill                 |    | <p>There is some information available on the composition of waste going to landfills, although dated. Handlers of special wastes will have records but these are not publicly available.</p> <p>Auckland has tonnage info from Claris &amp; MCC from Whitford</p> <p>information on weighbridge tonnages is provided as part of collection contracts</p> <p>Rodney DC can access collection data via licensing provisions</p>   | <p>The definition of 'special waste' is not clear. A more precise definition of the materials/products targeted is required.</p> <p>This may be addressed by the MfE. Some materials may also be addressed through product stewardship.</p> |
|  | Composition of special wastes sent to landfill                |    | <p>Handlers of special wastes may have composition information but this is not publicly available.</p>   | As above  |
|  | Composition and tonnage for residual household collection     |    | <p>Most Councils have good composition and tonnage information for their kerbside collections.</p>   |   |
|  | Composition and tonnage of residual waste at transfer station |  | <p>Surveys have been carried out at some transfer stations. Where transfer stations are under Council control and/or ownership, this information will be available. Tonnages will be recorded at all transfer stations but may not be available. Councils control Waitakere, Waiuku, Waiheke and Helensville Transfer Stations. Information on weighbridge tonnages is provided as a part of Council collection contracts. Rodney DC can access data on tonnages via licensing provisions.</p> |   |

|  |   |   |   |  |
|--|---|---|---|--|
|  | Quantities of special wastes diverted by type                                       |  | Various special waste operators will keep records on diversion and type, and transfer station operators will have information on amounts and types of material diverted, but this is not easily available unless transfer stations are Council owned and/or operated. |  |
|  | Special waste producers/generators  |  | The most significant waste producers/generators will provide information on volumes   | MfE work may address this gap.   |
|  | Information on waste generation flows to help target facility location and capacity |  | As above. The location of the most significant special waste producers/generators   | In the regional priorities document 'special' and inorganic wastes are considered together |

### Hazardous

| Waste Data area | Data required for measurement  | Availability of Data  | Notes  | Discussion/Recommendations  |
|-----------------|--|---|--|---|
| Hazardous       | Quantities ag chemical sent to landfill                                  |   | There is some information available on the composition of waste going to landfills, although dated. Handlers of agricultural chemicals will have records but these are not publicly available.   | The MfE may address this through a planned work area around tracking hazardous wastes.  |
|                 | Composition and tonnage of residual waste at transfer station & landfill |  | Where transfer stations are Council owned and/or operated, this information usually exists and is publicly accessible. For other transfer station, tonnage information will be recorded by the operator and intermittent composition surveys have been carried out at some.<br><br>Councils control Waitakere, Waiuku, Waiheke and Helensville Transfer Stations. Information on weighbridge | Through the landfill levy and associated records, MfE will receive information on tonnages from all landfills. They will also receive information on source, which would give an indication of composition. |

|  |   |   |  |
|--|---|---|--|
|  |   | <p>tonnages is provided as a part of Council collection contracts. Rodney DC can access data on tonnages via licensing provisions.</p> <p>Auckland region landfills are required to report on their tonnage. However much of Auckland's waste leaves the region and this information is not necessarily available. Composition of waste at landfills is rarely available. Some composition surveys have been carried out but these are rare and only give a snapshot.</p> |  |
| Quantities of ag chemicals diverted by type      |    | Various special waste operators will keep records on diversion and type, and transfer station operators will have information on amounts and types of material diverted, but this is not easily available unless transfer stations are Council owned and/or operated.   |  |
| Quantities to illegal/private disposal           |   | This information is not known and in most cases, the disposal point is not known.   |  |
| Agricultural Chemical Waste producers/generators |  | The most significant waste producers/generators will provide information on volumes   |  |
| ?  |   |   |  |
| Numbers of people using Hazmobile                |  | The ARC record the number of vehicles that attend every event.  |  |

|  |  |   |   |
|--|--|---|---|
| Quantities and types of materials collected at hazmobile/transfer stations |   | The ARC holds detailed information on the quantities and composition of material collected at the Hazmobile, AgChem collections and transfer station drop off facilities. Transfer station operators will record this information, but unless this is a Council owned and/or operated transfer station the information may not be available.  |   |
| Composition and tonnage for residual household collection                  |   | Most Councils have good composition and tonnage information for their kerbside collections.   |   |
| Quantity of hazardous waste in commercial waste streams                    |   | It is rare for collectors of commercial waste to carry out composition surveys.   | This information would be better collected at the disposal and/or transfer point. |
| Quantities of hazardous wastes diverted from landfill disposal             |  | <p>Various special waste operators will keep records on diversion and type, and transfer station operators will have information on amounts and types of material diverted, but this is not easily available unless transfer stations are Council owned and/or operated.</p> <p>The ARC holds detailed records on the hazardous waste diverted from landfill through the Hazmobile.</p> |   |
|  |  |   |   |

## Packaging & Other Recyclables

| Waste Data area                 | Data required for measurement               | Availability of Data  | Notes   | Discussion/Recommendations  |
|---------------------------------|---|---|---|---|
| Packaging and other recyclables | Household recyclable collection tonnages    |    | All TA's have good data on quantities of recyclable materials collected from households through council contracted services   |   |
|                                 | Composition of recyclables                  |    | All TA's have good data on composition of recyclable materials collected from households through council contracted services  |   |
|                                 | Composition of residual collected waste     |    | All TA's in the Auckland region collect regular information on the composition of household collected waste.<br><br>The composition of private wheelie bin collections is not in the public domain however.   | Private wheelie bins are likely to have different composition to council collections. Private services are usually contracted where waste volumes in a household are high. This may reflect lower levels of recycling and/or composting by the household  |
|                                 | Tonnages of residual collected waste        |   | All TA's have good information on the tonnages of waste collected by council contractors.<br><br>There is limited information on quantities of private bin waste. The Northern Alliance (Nth Shore, Waitakere, Rodney) get information from their licensing scheme. | The quantity of material collected by private bin services varies by council according to the nature of the collection service provided. Estimates can be made based on participation data.<br><br>Extending the northern alliance licensing scheme may yield useful information on total tonnages of household waste collected |
|                                 | Public place recyclable collection tonnages |  | Councils servicing public place recycling facilities should keep data on this   | There are limited public place recycling facilities currently in place in the Auckland region.<br><br>The Love NZ programme has provided good quality data on sites participating   |

|   |   |   |  |
|---|---|---|--|
|   |   |   | <p>in the programme across NZ but none of these sites are currently in the Auckland region</p> <p>The Rugby World Cup in 2011 will most likely witness increased numbers of public place recycling facilities and so this will be of increased importance.</p> |
| Composition of public place recyclables |    | There is limited information from past surveys and from the Love NZ programme   |  |
| Composition and tonnages of litter      |    | <p>All councils collect information on litter quantities.</p> <p>Composition of litter is obtained from periodic surveys</p>  |  |
| Event recyclable collection tonnages    |    | <p>Private events with zero waste or high diversion goals will typically publicise their achievements</p> <p>Most events do not keep good quality data on waste</p> | <p>Event waste data reporting could be required by Councils issues permits for events in public areas.</p> <p>Events on private property are more problematic to control. The best information may come from operator licensing</p>                            |
| Composition of event recyclables        |  | <p>Private events with zero waste or high diversion goals will typically publicise their achievements</p> <p>Most events do not keep good quality data on waste</p> |  |
| Composition and tonnages of event waste |  | <p>Private events with zero waste or high diversion goals will typically publicise their achievements</p> <p>Most events do not keep good quality</p>               |  |

|  |  |   |   |  |
|--|--|---|---|--|
|  |  |   | data on waste   |  |
|  | Composition and quantities of recyclables from recycling centres |  | There is good information from council controlled facilities.<br>Non-council controlled facilities will gather the information but it is not in the public domain |  |

### Inorganics

| Waste Data area | Data required for measurement  | Availability of Data  | Notes   | Discussion/Recommendations   |
|-----------------|--|---|---|--|
| Inorganics      | Household inorganic collection tonnages  |    | Councils can provide data on inorganic collection tonnages.<br>FDC provides periodic drop off site for inorganic. No collections for RDC.   |  |
|                 | Composition of inorganic collected material<br><br>Composition and tonnages of residual collected waste from inorganic collections |   | Some Councils have carried out composition surveys on the inorganic collections; however these are intermittent if they occur – for example Waste Not have carried out a couple of composition surveys for ACC over the last 12 years.<br><br>All councils will hold information on tonnages. | If the Region is serious about the Resource Recovery Park concept, it is important to know what the diversion potential is from inorganic material – from the property, not after placement on the kerbside or collection. |
|                 | Composition and tonnage of residual waste at transfer station & landfill   |  | Where transfer stations are Council owned and/or operated, this information usually exists and is publicly accessible. For other transfer station, tonnage information will be  | Through the landfill levy and associated records, MfE will receive information on tonnages from all landfills. They will also receive information on source, which would   |

|  |                    |   |   |                                    |
|--|--------------------|---|---|------------------------------------|
|  |                    |   | <p>recorded by the operator and intermittent composition surveys have been carried out at some.</p> <p>Councils control Waitakere, Waiuku, Waiheke and Helensville Transfer Stations. Information on weighbridge tonnages is provided as a part of Council collection contracts. Rodney DC can access data on tonnages via licensing provisions.</p> <p>Auckland region landfills are required to report on their tonnage. However much of Auckland's waste leaves the region and this information is not necessarily available. Composition of waste at landfills is rarely available. Some composition surveys have been carried out but these are rare and only give a snapshot.</p> | give an indication of composition. |
|  | Participation data |  | Few Councils collect information on inorganic collection participation.   |                                    |
|  |                    |   |   |                                    |

### Residual

| Waste Data area | Data required for measurement | Availability of Data | Notes | Discussion/Recommendations |
|-----------------|-------------------------------|----------------------|-------|----------------------------|
|-----------------|-------------------------------|----------------------|-------|----------------------------|

|          |   |   |   |  |
|----------|---|---|---|--|
| Residual | Tonnages to landfill from the Auckland region |    | <p>Landfill data from Whitford is currently in the public domain due to the JV between MCC and TPI.</p> <p>Claris landfill is owned by Auckland City Council but has no weighbridge and data is limited.</p> <p>Redvale Landfill is required to supply annual tonnage and composition figures to ARC as part of its consents.</p> <p>Material going to Hampton Downs in the Waikato is not in the public domain - it is not required to supply this information as part of its consents. Information on tonnages from Auckland is provided to ARC for its 5 yearly stocktake.</p> | <p>MfE is now collecting landfill tonnage information through the landfill levy. It is not yet clear how this information will be used or what may get passed on to local authorities</p> <p>Knowing the total waste to landfill from the Auckland Region is one of the most fundamental metrics for effective management of waste in the region. The key barrier at present is the lack of information on material going to Hampton Downs. If this information does not become available via the landfill levy process it may be worthwhile the Auckland Council entering discussions with Hampton Downs owners Envirowaste to access the information on an annual basis.</p> |
|          | Population data                               |    | Population data is available from Statistics NZ   |  |
|          | Council collected tonnages to landfill        |    | All TAs have good information on tonnages sent to landfill by contractors and council operators   |  |
|          | Private sector collected tonnages to landfill |  | There is limited information on quantities of private bin waste. The Northern Alliance (Nth Shore, Waitakere, Rodney) get information from their licensing scheme.  | <p>The quantity of material collected by private bin services varies by council according to the nature of the collection service provided. Estimates can be made based on participation data.</p> <p>Extending the northern alliance licensing scheme may yield useful information on total tonnages of household waste collected</p>   |

### Contaminated Soil

| Waste Data area | Data required for measurement | Availability of Data | Notes | Discussion/Recommendations |
|-----------------|-------------------------------|----------------------|-------|----------------------------|
|-----------------|-------------------------------|----------------------|-------|----------------------------|

|                   |   |   |  |   |
|-------------------|---|---|--|---|
| Contaminated Soil | Location of all contaminated sites recorded and records easily accessible |  | <p>Most if not all significantly contaminated sites are noted in landuse information</p> <p>Low level contaminated sites are generally not tracked</p> | <p>The Ministry for the Environment recommend use of the HAIL (Hazardous Activities in Industry List) register to identify, assess, record, and manage sites.</p> <p>Regional Councils identify potentially contaminated sites, while TA's are responsible for determining and managing land use activities.</p>  |
|                   | Tracking of movement of contaminated soils to licensed facilities         |  | There is no system in place for tracking where materials removed from a site are taken to.   | <p>Developers should have a requirement for any contaminated soil removed from a site to be shown to have been taken to a licensed facility.</p> <p>Waste Track is an MfE tool for tracking transportation of liquid and hazardous wastes, which could be adopted to include contaminated sites. There is a code of practice associated with Waste Track.</p> |

### Illegal Dumping & Litter

| Waste Data area            | Data required for measurement           | Availability of Data  | Notes   | Discussion/Recommendations  |
|----------------------------|---|---|---|---|
| Illegal Dumping and Litter | Quantities of illegal dumping collected |  | <p>All TA's have information on quantities of illegal dumping that are reported and collected.</p> <p>Not all illegal disposal activity is reported</p> | Illegal dumping and litter are noted in the regional priorities document but no specific actions or targets are put forward |

|                                     |   |   |   |
|-------------------------------------|---|---|---|
| Areas of collection illegal dumping |  | TA's will generally collect information on illegal dumping 'hotspots'.<br>Not all illegal disposal activity is reported |   |
| Quantities of litter collected      |  | All TA's have information on quantities of litter collected.  |   |
| Areas of collection                 |  | All TA's will have information on the source of litter collected.   |   |
| Composition of illegal dumping      |  | There is anecdotal information on illegal dumping composition. This information is not usually gathered.                | Illegal dumping composition is potentially useful in profiling the characteristics dumping. This could help better determine the reasons for dumping taking place and inform strategies to combat dumping |
| Composition of litter               |  | Composition of litter is obtained from periodic surveys   | Periodic information on litter composition is likely to be insufficient for monitoring the impacts of new management strategies   |

# Appendix B: Council refuse and recycling services

| AUCKLAND CITY COUNCIL REFUSE AND RECYCLING SERVICES       |  |   |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |
|---|--|---|------------------|---|---|-------|---------------|--------------------|----------|---------------|--------------------|--------------|---------------|--------------------|----------------|--------------|--------------------|--------------------|--------------|--------------------|-------|--------------|--------------------|----------|--------------|--------------------|--------------------|---------------|--------------------|-----------------------|--------------|--------------------|--------|--------------|--------------------|--------|--------------|--------------------|-----------------------|--------------|--------------------|-------|--------|--------------------|
| AUCKLAND CITY COUNCIL DOMESTIC KERBSIDE REFUSE COLLECTION |  |   |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |
| Service description                                       | Council provides a uniform annual charge-funded weekly collection of refuse from 120-litre wheelie bins to all rateable properties in the Auckland isthmus.  |   |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |
| Contractor(s)   | The kerbside refuse collection is split into three contracts:<br>West Auckland and central business district – Metropolitan Waste Ltd<br>East Auckland – Enviroway Ltd<br>Contracts for disposal of refuse are with Transpacific Industries Group (NZ) Ltd.  |   |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |
| Collect contract expiry date                              | Both collection contracts expire in June 2011<br>Disposal contract expires in June 2010.   |   |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |
| Disposal point(s)   | Kerbside refuse is disposed of at several locations: Whitford Landfill, Redvale Landfill, and Wiri, Rosedale, and Pikes Point transfer stations.   |   |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |
| Annual tonnage  | 74,000 tonnes to June 2009, including Waiheke Island   |   |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |
| Market share  | A 2006 participation survey by Waste Not Consulting indicates that over 98% of residential properties use the Council's kerbside collection service.   |   |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |
| Composition   | <p>Composition audits are undertaken regularly by Waste Not Consulting. The primary composition from December 2008 is given below. The mean wt. per household is the average weight set out by a household when it sets a bin out for collection, and does not necessarily equate to a weekly waste generation.</p> <table border="1"> <thead> <tr> <th>Primary category</th> <th>Proportion of total (95% confidence interval)</th> <th>Mean wt / bin (95% confidence interval)</th> </tr> </thead> <tbody> <tr> <td>Paper</td> <td>11.6% (±1.9%)</td> <td>1.15 kg (±0.19 kg)</td> </tr> <tr> <td>Plastics</td> <td>10.5% (±1.0%)</td> <td>1.04 kg (±0.10 kg)</td> </tr> <tr> <td>Putrescibles</td> <td>52.5% (±6.4%)</td> <td>5.21 kg (±0.63 kg)</td> </tr> <tr> <td>Ferrous metals</td> <td>2.0% (±0.7%)</td> <td>0.20 kg (±0.07 kg)</td> </tr> <tr> <td>Non-ferrous metals</td> <td>0.9% (±0.3%)</td> <td>0.09 kg (±0.03 kg)</td> </tr> <tr> <td>Glass</td> <td>1.7% (±0.4%)</td> <td>0.17 kg (±0.04 kg)</td> </tr> <tr> <td>Textiles</td> <td>4.2% (±1.2%)</td> <td>0.42 kg (±0.12 kg)</td> </tr> <tr> <td>Nappies &amp; sanitary</td> <td>11.4% (±2.7%)</td> <td>1.13 kg (±0.27 kg)</td> </tr> <tr> <td>Rubble, concrete, etc</td> <td>2.6% (±1.6%)</td> <td>0.26 kg (±0.16 kg)</td> </tr> <tr> <td>Timber</td> <td>1.3% (±1.4%)</td> <td>0.13 kg (±0.14 kg)</td> </tr> <tr> <td>Rubber</td> <td>0.5% (±0.4%)</td> <td>0.04 kg (±0.04 kg)</td> </tr> <tr> <td>Potentially hazardous</td> <td>0.9% (±0.4%)</td> <td>0.09 kg (±0.04 kg)</td> </tr> <tr> <td>TOTAL</td> <td>100.0%</td> <td>9.92 kg (±0.98 kg)</td> </tr> </tbody> </table> |   | Primary category | Proportion of total (95% confidence interval) | Mean wt / bin (95% confidence interval) | Paper | 11.6% (±1.9%) | 1.15 kg (±0.19 kg) | Plastics | 10.5% (±1.0%) | 1.04 kg (±0.10 kg) | Putrescibles | 52.5% (±6.4%) | 5.21 kg (±0.63 kg) | Ferrous metals | 2.0% (±0.7%) | 0.20 kg (±0.07 kg) | Non-ferrous metals | 0.9% (±0.3%) | 0.09 kg (±0.03 kg) | Glass | 1.7% (±0.4%) | 0.17 kg (±0.04 kg) | Textiles | 4.2% (±1.2%) | 0.42 kg (±0.12 kg) | Nappies & sanitary | 11.4% (±2.7%) | 1.13 kg (±0.27 kg) | Rubble, concrete, etc | 2.6% (±1.6%) | 0.26 kg (±0.16 kg) | Timber | 1.3% (±1.4%) | 0.13 kg (±0.14 kg) | Rubber | 0.5% (±0.4%) | 0.04 kg (±0.04 kg) | Potentially hazardous | 0.9% (±0.4%) | 0.09 kg (±0.04 kg) | TOTAL | 100.0% | 9.92 kg (±0.98 kg) |
| Primary category  | Proportion of total (95% confidence interval)  | Mean wt / bin (95% confidence interval) |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |
| Paper   | 11.6% (±1.9%)  | 1.15 kg (±0.19 kg)                      |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |
| Plastics  | 10.5% (±1.0%)  | 1.04 kg (±0.10 kg)                      |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |
| Putrescibles  | 52.5% (±6.4%)  | 5.21 kg (±0.63 kg)                      |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |
| Ferrous metals  | 2.0% (±0.7%)   | 0.20 kg (±0.07 kg)                      |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |
| Non-ferrous metals  | 0.9% (±0.3%)   | 0.09 kg (±0.03 kg)                      |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |
| Glass   | 1.7% (±0.4%)   | 0.17 kg (±0.04 kg)                      |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |
| Textiles  | 4.2% (±1.2%)   | 0.42 kg (±0.12 kg)                      |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |
| Nappies & sanitary  | 11.4% (±2.7%)  | 1.13 kg (±0.27 kg)                      |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |
| Rubble, concrete, etc                                     | 2.6% (±1.6%)   | 0.26 kg (±0.16 kg)                      |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |
| Timber  | 1.3% (±1.4%)   | 0.13 kg (±0.14 kg)                      |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |
| Rubber  | 0.5% (±0.4%)   | 0.04 kg (±0.04 kg)                      |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |
| Potentially hazardous                                     | 0.9% (±0.4%)   | 0.09 kg (±0.04 kg)                      |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |
| TOTAL   | 100.0%   | 9.92 kg (±0.98 kg)                      |                  |   |   |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                       |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                    |

| AUCKLAND CITY COUNCIL REFUSE AND RECYCLING SERVICES          |  |                               |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
|--|--|-------------------------------|---|-------------------------------|-------|--------------|------|----------|--------------|-----------|--------------|--------------|------|-------------------|-------|-------|------|-------|------|
| AUCKLAND CITY COUNCIL DOMESTIC KERBSIDE RECYCLING COLLECTION |  |                               |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| Service description  | Fortnightly collection of 240-litre wheelie bin permitted to contain plastics #1-7, glass bottles and jars, steel and aluminium cans, and paper and cardboard.   |                               |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| Contractor(s)  | Processing by Visy Recycling (NZ) Ltd<br>Collection of recyclables by Thiess Services NZ Ltd   |                               |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| Contract expiry date   | Processing contract expires June 2022<br>Collection contract expires June 2015   |                               |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| Disposal point(s)  | All collected material is taken to the Visy processing facility in Onehunga.   |                               |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| Annual tonnage   | 41,000 tonnes to June 2008   |                               |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| Composition  | <p>Due to its operational practices, Visy Recycling is not able to differentiate the composition of the recycling from Manukau and Auckland. The following composition data is for the combined recycling stream, and is based on data from January - June 2009.</p> <table border="1"> <tbody> <tr> <td>Mixed Plastic</td> <td>2.3%</td> </tr> <tr> <td>Glass</td> <td>39.5%</td> </tr> <tr> <td>HDPE</td> <td>0.9%</td> </tr> <tr> <td>PET</td> <td>1.3%</td> </tr> <tr> <td>Aluminium</td> <td>0.3%</td> </tr> <tr> <td>Steel</td> <td>2.0%</td> </tr> <tr> <td>Paper &amp; Cardboard</td> <td>49.2%</td> </tr> <tr> <td>Waste</td> <td>4.5%</td> </tr> <tr> <td>Total</td> <td>100%</td> </tr> </tbody> </table> | Mixed Plastic                 | 2.3%  | Glass                         | 39.5% | HDPE         | 0.9% | PET      | 1.3%         | Aluminium | 0.3%         | Steel        | 2.0% | Paper & Cardboard | 49.2% | Waste | 4.5% | Total | 100% |
| Mixed Plastic  | 2.3%   |                               |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| Glass  | 39.5%  |                               |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| HDPE   | 0.9%   |                               |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| PET  | 1.3%   |                               |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| Aluminium  | 0.3%   |                               |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| Steel  | 2.0%   |                               |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| Paper & Cardboard  | 49.2%  |                               |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| Waste  | 4.5%   |                               |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| Total  | 100%   |                               |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| AUCKLAND CITY COUNCIL INORGANIC REFUSE COLLECTION            |  |                               |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| Service description  | Council provides a two-yearly kerbside collection of inorganic refuse throughout the isthmus.  |                               |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| Contractor(s)  | Alpha Refuse Collections Ltd have undertaken the most recent collections, but new contracts are let for each collection.   |                               |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| Disposal point(s)  | All inorganic refuse collected by Council is disposed of at Whitford Landfill.   |                               |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| Tonnage  | Approximately 10,000 tonnes from each two-yearly collection.   |                               |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| Composition  | <p>Audits of the composition of Auckland City's inorganic collection have been undertaken by Waste Not Consulting. The results of the 2007 audit are shown.</p> <table border="1"> <thead> <tr> <th>Primary classification</th> <th>% of total<br/>(margin of error for<br/>95% confidence<br/>interval)</th> <th>Tonnes<br/>collected -<br/>2007</th> </tr> </thead> <tbody> <tr> <td>Paper</td> <td>6.4% (±1.5%)</td> <td>617</td> </tr> <tr> <td>Plastics</td> <td>5.9% (±1.4%)</td> <td>574</td> </tr> <tr> <td>Putrescibles</td> <td>1.7% (±1.0%)</td> <td>161</td> </tr> </tbody> </table>   | Primary classification        | % of total<br>(margin of error for<br>95% confidence<br>interval) | Tonnes<br>collected -<br>2007 | Paper | 6.4% (±1.5%) | 617  | Plastics | 5.9% (±1.4%) | 574       | Putrescibles | 1.7% (±1.0%) | 161  |                   |       |       |      |       |      |
| Primary classification                                       | % of total<br>(margin of error for<br>95% confidence<br>interval)  | Tonnes<br>collected -<br>2007 |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| Paper  | 6.4% (±1.5%)   | 617                           |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| Plastics   | 5.9% (±1.4%)   | 574                           |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |
| Putrescibles   | 1.7% (±1.0%)   | 161                           |   |                               |       |              |      |          |              |           |              |              |      |                   |       |       |      |       |      |

| AUCKLAND CITY COUNCIL REFUSE AND RECYCLING SERVICES |   |       |         |      |
|---|---|-------|---------|------|
|   | Ferrous metals  | 11.1% | (±2.8%) | 1076 |
|   | Non-ferrous metals  | 0.4%  | (±0.1%) | 36   |
|   | Glass   | 3.6%  | (±1.0%) | 347  |
|   | Textiles  | 17.3% | (±3.4%) | 1672 |
|   | Nappies and sanitary  | 0.03% | (±0.1%) | 3    |
|   | Rubble, concrete, etc   | 7.6%  | (±2.4%) | 734  |
|   | Timber  | 44.9% | (±5.8%) | 4349 |
|   | Rubber  | 0.6%  | (±0.3%) | 54   |
|   | Potentially hazardous   | 0.6%  | (±0.2%) | 54   |
|   | Total   | 100%  |         | 9676 |
| OTHER AUCKLAND CITY COUNCIL COLLECTION SERVICES     |   |       |         |      |
| Central business district                           | Separate collections of bagged refuse and recyclables are provided in the inner CBD.  |       |         |      |
| Waiheke Island                                      | Transpacific Industries Group (NZ) Ltd is contracted for a bag or bin collection service, the operation of the transfer station, and disposal of refuse in contracts terminating in June 2019.  |       |         |      |
| Great Barrier Island                                | Bagged refuse collection is contracted to Great Barrier Cartage through contracts that expire July 2010. All refuse is disposed of at Claris Landfill.  |       |         |      |
| Litter etc.   | A range of Council contracts provide for the collection of litter from the roadside, walkways, street gardens, shopping areas and from litter bins throughout the City and for the collection of illegally dumped refuse  |       |         |      |
| AUCKLAND CITY COUNCIL TRANSFER STATIONS/LANDFILLS   |   |       |         |      |
| Description   | <p>Operation of the Waiheke Island transfer station has been contracted to Transpacific Industries Group (NZ) until June 2019.</p> <p>Operation of the Claris Landfill on Great Barrier Island is contracted to Great Barrier Cartage through contracts that expire in July 2010.</p> |       |         |      |

| FRANKLIN DISTRICT COUNCIL REFUSE AND RECYCLING SERVICES       |  |                     |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
|---|--|---------------------|------------------------|--|---------------------|---------------------|-------|-------|---------|----------|-------|---------|--------------|-------|---------|----------------|------|---------|--------------------|------|---------|-------|------|---------|----------|------|---------|--------------------|------|---------|--------|------|---------|--------|------|---------|--------|------|---------|-----------------------|------|---------|-------|--------|----------|
| FRANKLIN DISTRICT COUNCIL DOMESTIC KERBSIDE REFUSE COLLECTION |  |                     |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
| Service description   | Council provides for weekly domestic refuse collections in all parts of the District north of the Waikato River and in the Onewhero and Port Waikato area. In all areas served, other than Tuakau, the collection is on a user-pays bag basis, using pre-paid stickers. The Council contractor for the bagged refuse collection is EnviroWaste Services Ltd. In Tuakau, a 120-litre wheeled bin based refuse service is provided to residents.   |                     |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
| Contractor(s)   | Bag collection - EnviroWaste Services Ltd<br>Wheeled bin collection – EnviroWaste Services Ltd (subcontracted to Enviroway)  |                     |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
| Contract expiry date  | 2010 with potential 2 year roll over   |                     |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
| Disposal point(s)   | EnviroWaste disposes of kerbside refuse at Pukekohe transfer station.  |                     |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
| Annual tonnage  | Approximately 5000 tonnes per year from the Council bag collection.<br>Approximately 650 tonnes per year from Tuakau wheeled bin collection  |                     |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
| Market share  | In Pukekohe and Waiuku, approximately 60% of households use the Council bag service, with the other 40% using private wheeled bin collection services. In Tuakau, over 95% of households are estimated to use the Council wheeled bin service. Council share estimated to be 50% of market, by weight, overall.  |                     |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
| Composition   | <p>Composition audits are undertaken regularly by Waste Not Consulting. The primary composition of the Council's bagged refuse collection from February 2007 is given in the table on the next page. The mean wt. per household is the average weight set out by a household when it sets bags out for collection.</p> <table border="1"> <thead> <tr> <th rowspan="2">Primary category</th> <th colspan="2">Franklin District bags</th> </tr> <tr> <th>Proportion of total</th> <th>Mean wt / household</th> </tr> </thead> <tbody> <tr> <td>Paper</td> <td>16.1%</td> <td>1.77 kg</td> </tr> <tr> <td>Plastics</td> <td>16.0%</td> <td>1.76 kg</td> </tr> <tr> <td>Putrescibles</td> <td>40.7%</td> <td>4.48 kg</td> </tr> <tr> <td>Ferrous metals</td> <td>3.2%</td> <td>0.35 kg</td> </tr> <tr> <td>Non-ferrous metals</td> <td>1.3%</td> <td>0.15 kg</td> </tr> <tr> <td>Glass</td> <td>9.2%</td> <td>1.01 kg</td> </tr> <tr> <td>Textiles</td> <td>2.4%</td> <td>0.26 kg</td> </tr> <tr> <td>Nappies &amp; sanitary</td> <td>9.1%</td> <td>1.00 kg</td> </tr> <tr> <td>Rubble</td> <td>0.9%</td> <td>0.09 kg</td> </tr> <tr> <td>Timber</td> <td>0.3%</td> <td>0.03 kg</td> </tr> <tr> <td>Rubber</td> <td>0.1%</td> <td>0.01 kg</td> </tr> <tr> <td>Potentially hazardous</td> <td>0.7%</td> <td>0.07 kg</td> </tr> <tr> <td>TOTAL</td> <td>100.0%</td> <td>10.99 kg</td> </tr> </tbody> </table> | Primary category    | Franklin District bags |  | Proportion of total | Mean wt / household | Paper | 16.1% | 1.77 kg | Plastics | 16.0% | 1.76 kg | Putrescibles | 40.7% | 4.48 kg | Ferrous metals | 3.2% | 0.35 kg | Non-ferrous metals | 1.3% | 0.15 kg | Glass | 9.2% | 1.01 kg | Textiles | 2.4% | 0.26 kg | Nappies & sanitary | 9.1% | 1.00 kg | Rubble | 0.9% | 0.09 kg | Timber | 0.3% | 0.03 kg | Rubber | 0.1% | 0.01 kg | Potentially hazardous | 0.7% | 0.07 kg | TOTAL | 100.0% | 10.99 kg |
| Primary category  | Franklin District bags   |                     |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
|   | Proportion of total  | Mean wt / household |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
| Paper   | 16.1%  | 1.77 kg             |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
| Plastics  | 16.0%  | 1.76 kg             |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
| Putrescibles  | 40.7%  | 4.48 kg             |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
| Ferrous metals  | 3.2%   | 0.35 kg             |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
| Non-ferrous metals  | 1.3%   | 0.15 kg             |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
| Glass   | 9.2%   | 1.01 kg             |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
| Textiles  | 2.4%   | 0.26 kg             |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
| Nappies & sanitary  | 9.1%   | 1.00 kg             |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
| Rubble  | 0.9%   | 0.09 kg             |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
| Timber  | 0.3%   | 0.03 kg             |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
| Rubber  | 0.1%   | 0.01 kg             |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
| Potentially hazardous   | 0.7%   | 0.07 kg             |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |
| TOTAL   | 100.0%   | 10.99 kg            |                        |  |                     |                     |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |        |      |         |        |      |         |        |      |         |                       |      |         |       |        |          |

## FRANKLIN DISTRICT COUNCIL REFUSE AND RECYCLING SERVICES

The primary composition of the Council's Tuakau wheelie bin collection from February 2007 is given below. The mean wt. per household is the average weight set out by a household when it sets its bin out for collection.

| Primary category      | Tuakau wheelie bins |                     |
|-----------------------|---------------------|---------------------|
|                       | Proportion of total | Mean wt / household |
| Paper                 | 10.2%               | 1.18 kg             |
| Plastics              | 11.2%               | 1.29 kg             |
| Putrescibles          | 57.3%               | 6.65 kg             |
| Ferrous metals        | 4.1%                | 0.48 kg             |
| Non-ferrous metals    | 0.6%                | 0.07 kg             |
| Glass                 | 4.9%                | 0.57 kg             |
| Textiles              | 2.2%                | 0.26 kg             |
| Nappies & sanitary    | 5.0%                | 0.57 kg             |
| Rubble                | 1.5%                | 0.17 kg             |
| Timber                | 1.6%                | 0.19 kg             |
| Rubber                | 0.6%                | 0.06 kg             |
| Potentially hazardous | 0.9%                | 0.11 kg             |
| <b>TOTAL</b>          | <b>100.0%</b>       | <b>11.60 kg</b>     |

## FRANKLIN DISTRICT COUNCIL DOMESTIC KERBSIDE RECYCLING COLLECTION

|                      |  |
|----------------------|--|
| Service description  | Council's weekly domestic kerbside recycling collection is available in Pukekohe, Waiuku and Tuakau, Clarks Beach, and Waiau Pa townships. Each urban household is provided with a blue 55-litre recycling bin for recycling glass, aluminium and steel cans, and plastics (#1-7). Paper and cardboard are collected separately from the kerbside. |
| Contractor(s)        | Transpacific Allbrite Ltd  |
| Contract expiry date | 2010   |
| Disposal point(s)    | All collected material is taken to Transpacific Allbrite processing facility   |
| Annual tonnage       | Approximately 2800 tonnes per year.  |
| Composition          | Reliable data are not available.   |

## FRANKLIN DISTRICT COUNCIL INORGANIC REFUSE COLLECTION

|                     |  |
|---------------------|--|
| Service description | Council provides inorganic refuse drop-off days, on an occasional basis. |
|---------------------|--|

## OTHER FRANKLIN DISTRICT COUNCIL COLLECTION SERVICES

|             |   |
|-------------|---|
| Litter etc. | A range of Council contracts provide for the collection of litter from the roadside, walkways, street gardens, shopping areas and from litter bins throughout the District and for the collection of illegally dumped refuse. |
|-------------|---|

## FRANKLIN DISTRICT TRANSFER STATIONS/LANDFILLS

|                   |  |
|-------------------|--|
| Pukekohe transfer | Pukekohe transfer station is owned and operated by EnviroWaste |
|-------------------|--|

FRANKLIN DISTRICT COUNCIL REFUSE AND RECYCLING SERVICES

| station                 | Services Ltd. No data regarding tonnage or composition are in the public domain. All waste from the facility is disposed of at Hampton Downs Landfill.   |                  |   |       |              |          |              |              |               |                |              |                    |              |       |              |          |               |                      |              |        |               |        |               |        |              |                       |              |       |        |
|-------------------------|--|------------------|---|-------|--------------|----------|--------------|--------------|---------------|----------------|--------------|--------------------|--------------|-------|--------------|----------|---------------|----------------------|--------------|--------|---------------|--------|---------------|--------|--------------|-----------------------|--------------|-------|--------|
| Waiuku transfer station | <p>Council owns the Waiuku transfer station. Operation of the facility is contracted to Waiuku Recycling Ltd. All waste from the facility, approximately 800 tonnes per annum, is transported to Hampton Downs Landfill.</p> <p>A SWAP survey of the facility was undertaken by Waste Not Consulting in 2008. The primary composition of the refuse is given in the table on the following page</p> <p>Composition of refuse at Waiuku transfer station</p> <table border="1"> <thead> <tr> <th>Primary category</th> <th>Proportion of total (margins of error for 95% confidence level)</th> </tr> </thead> <tbody> <tr> <td>Paper</td> <td>4.0% (±1.0%)</td> </tr> <tr> <td>Plastics</td> <td>9.9% (±1.9%)</td> </tr> <tr> <td>Putrescibles</td> <td>12.1% (±2.6%)</td> </tr> <tr> <td>Ferrous metals</td> <td>8.1% (±1.8%)</td> </tr> <tr> <td>Non ferrous metals</td> <td>1.6% (±0.4%)</td> </tr> <tr> <td>Glass</td> <td>5.7% (±2.6%)</td> </tr> <tr> <td>Textiles</td> <td>10.4% (±3.5%)</td> </tr> <tr> <td>Nappies and sanitary</td> <td>1.3% (±0.7%)</td> </tr> <tr> <td>Rubble</td> <td>15.2% (±6.6%)</td> </tr> <tr> <td>Timber</td> <td>22.0% (±5.5%)</td> </tr> <tr> <td>Rubber</td> <td>7.9% (±5.0%)</td> </tr> <tr> <td>Potentially hazardous</td> <td>1.9% (±0.5%)</td> </tr> <tr> <td>Total</td> <td>100.0%</td> </tr> </tbody> </table> | Primary category | Proportion of total (margins of error for 95% confidence level) | Paper | 4.0% (±1.0%) | Plastics | 9.9% (±1.9%) | Putrescibles | 12.1% (±2.6%) | Ferrous metals | 8.1% (±1.8%) | Non ferrous metals | 1.6% (±0.4%) | Glass | 5.7% (±2.6%) | Textiles | 10.4% (±3.5%) | Nappies and sanitary | 1.3% (±0.7%) | Rubble | 15.2% (±6.6%) | Timber | 22.0% (±5.5%) | Rubber | 7.9% (±5.0%) | Potentially hazardous | 1.9% (±0.5%) | Total | 100.0% |
| Primary category        | Proportion of total (margins of error for 95% confidence level)  |                  |   |       |              |          |              |              |               |                |              |                    |              |       |              |          |               |                      |              |        |               |        |               |        |              |                       |              |       |        |
| Paper                   | 4.0% (±1.0%)   |                  |   |       |              |          |              |              |               |                |              |                    |              |       |              |          |               |                      |              |        |               |        |               |        |              |                       |              |       |        |
| Plastics                | 9.9% (±1.9%)   |                  |   |       |              |          |              |              |               |                |              |                    |              |       |              |          |               |                      |              |        |               |        |               |        |              |                       |              |       |        |
| Putrescibles            | 12.1% (±2.6%)  |                  |   |       |              |          |              |              |               |                |              |                    |              |       |              |          |               |                      |              |        |               |        |               |        |              |                       |              |       |        |
| Ferrous metals          | 8.1% (±1.8%)   |                  |   |       |              |          |              |              |               |                |              |                    |              |       |              |          |               |                      |              |        |               |        |               |        |              |                       |              |       |        |
| Non ferrous metals      | 1.6% (±0.4%)   |                  |   |       |              |          |              |              |               |                |              |                    |              |       |              |          |               |                      |              |        |               |        |               |        |              |                       |              |       |        |
| Glass                   | 5.7% (±2.6%)   |                  |   |       |              |          |              |              |               |                |              |                    |              |       |              |          |               |                      |              |        |               |        |               |        |              |                       |              |       |        |
| Textiles                | 10.4% (±3.5%)  |                  |   |       |              |          |              |              |               |                |              |                    |              |       |              |          |               |                      |              |        |               |        |               |        |              |                       |              |       |        |
| Nappies and sanitary    | 1.3% (±0.7%)   |                  |   |       |              |          |              |              |               |                |              |                    |              |       |              |          |               |                      |              |        |               |        |               |        |              |                       |              |       |        |
| Rubble                  | 15.2% (±6.6%)  |                  |   |       |              |          |              |              |               |                |              |                    |              |       |              |          |               |                      |              |        |               |        |               |        |              |                       |              |       |        |
| Timber                  | 22.0% (±5.5%)  |                  |   |       |              |          |              |              |               |                |              |                    |              |       |              |          |               |                      |              |        |               |        |               |        |              |                       |              |       |        |
| Rubber                  | 7.9% (±5.0%)   |                  |   |       |              |          |              |              |               |                |              |                    |              |       |              |          |               |                      |              |        |               |        |               |        |              |                       |              |       |        |
| Potentially hazardous   | 1.9% (±0.5%)   |                  |   |       |              |          |              |              |               |                |              |                    |              |       |              |          |               |                      |              |        |               |        |               |        |              |                       |              |       |        |
| Total                   | 100.0%   |                  |   |       |              |          |              |              |               |                |              |                    |              |       |              |          |               |                      |              |        |               |        |               |        |              |                       |              |       |        |

| MANUKAU CITY COUNCIL REFUSE AND RECYCLING SERVICES          |   |                     |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
|---|---|---------------------|----------------------------------|---------------------|-------|---------|-------|----------|---------|-------|---------|---------|-------|----------------|---------|------|--------------------|---------|------|-------|---------|------|----------|---------|------|--------------------|---------|-------|------------------------|---------|------|--------|---------|------|--------|---------|------|-----------------------|---------|------|-------|----------|--------|
| MANUKAU CITY COUNCIL DOMESTIC KERBSIDE REFUSE COLLECTION    |   |                     |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| Service description   | A rates-funded kerbside refuse collection is provided by Council on a weekly basis for residential premises. Residents are permitted to set out any number of bags each week.   |                     |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| Contractor(s)   | Alpha Refuse Collections Ltd holds the kerbside collection contract.<br><br>The disposal contract is with Waste Disposal Services, an unincorporated joint venture between Manukau City Council and Transpacific Industries Group (NZ) Ltd  |                     |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| Contract expiry date  | Collection contract expires in June 2012<br><br>The disposal contract has no expiry date.   |                     |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| Disposal point(s)   | All kerbside refuse collected by Council is disposed of at Whitford Landfill.   |                     |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| Annual tonnage  | Approximately 64,000 tonnes for year to June 2008   |                     |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| Market share  | Estimated to be 95%, with the remainder of residential properties using private wheelie bin collections.  |                     |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| Composition   | <p>Composition audits are undertaken regularly by Waste Not Consulting. The primary composition from 2008 is given below. The mean wt. per household is the average weight set out by a household when it sets bags out for collection.</p> <table border="1"> <thead> <tr> <th>Primary category</th> <th>Mean set out wt / household (kg)</th> <th>Proportion of total</th> </tr> </thead> <tbody> <tr> <td>Paper</td> <td>1.58 kg</td> <td>10.0%</td> </tr> <tr> <td>Plastics</td> <td>1.75 kg</td> <td>11.0%</td> </tr> <tr> <td>Organic</td> <td>8.71 kg</td> <td>54.9%</td> </tr> <tr> <td>Ferrous metals</td> <td>0.26 kg</td> <td>1.6%</td> </tr> <tr> <td>Non-ferrous metals</td> <td>0.14 kg</td> <td>0.9%</td> </tr> <tr> <td>Glass</td> <td>0.31 kg</td> <td>2.0%</td> </tr> <tr> <td>Textiles</td> <td>0.68 kg</td> <td>4.3%</td> </tr> <tr> <td>Nappies &amp; sanitary</td> <td>1.94 kg</td> <td>12.2%</td> </tr> <tr> <td>Rubble, concrete, etc.</td> <td>0.22 kg</td> <td>1.4%</td> </tr> <tr> <td>Timber</td> <td>0.09 kg</td> <td>0.6%</td> </tr> <tr> <td>Rubber</td> <td>0.02 kg</td> <td>0.2%</td> </tr> <tr> <td>Potentially hazardous</td> <td>0.15 kg</td> <td>1.0%</td> </tr> <tr> <td>TOTAL</td> <td>15.87 kg</td> <td>100.0%</td> </tr> </tbody> </table> | Primary category    | Mean set out wt / household (kg) | Proportion of total | Paper | 1.58 kg | 10.0% | Plastics | 1.75 kg | 11.0% | Organic | 8.71 kg | 54.9% | Ferrous metals | 0.26 kg | 1.6% | Non-ferrous metals | 0.14 kg | 0.9% | Glass | 0.31 kg | 2.0% | Textiles | 0.68 kg | 4.3% | Nappies & sanitary | 1.94 kg | 12.2% | Rubble, concrete, etc. | 0.22 kg | 1.4% | Timber | 0.09 kg | 0.6% | Rubber | 0.02 kg | 0.2% | Potentially hazardous | 0.15 kg | 1.0% | TOTAL | 15.87 kg | 100.0% |
| Primary category  | Mean set out wt / household (kg)  | Proportion of total |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| Paper   | 1.58 kg   | 10.0%               |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| Plastics  | 1.75 kg   | 11.0%               |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| Organic   | 8.71 kg   | 54.9%               |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| Ferrous metals  | 0.26 kg   | 1.6%                |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| Non-ferrous metals  | 0.14 kg   | 0.9%                |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| Glass   | 0.31 kg   | 2.0%                |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| Textiles  | 0.68 kg   | 4.3%                |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| Nappies & sanitary  | 1.94 kg   | 12.2%               |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| Rubble, concrete, etc.                                      | 0.22 kg   | 1.4%                |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| Timber  | 0.09 kg   | 0.6%                |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| Rubber  | 0.02 kg   | 0.2%                |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| Potentially hazardous                                       | 0.15 kg   | 1.0%                |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| TOTAL   | 15.87 kg  | 100.0%              |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| MANUKAU CITY COUNCIL DOMESTIC KERBSIDE RECYCLING COLLECTION |   |                     |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| Service description   | Fortnightly collection of 240-litre wheelie bin permitted to contain plastics #1-7, glass bottles and jars, steel and aluminium cans, and paper and cardboard.  |                     |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |
| Contractor(s)   | Processing by Visy Recycling New Zealand<br>Collection of recyclables by Enviroway Ltd  |                     |                                  |                     |       |         |       |          |         |       |         |         |       |                |         |      |                    |         |      |       |         |      |          |         |      |                    |         |       |                        |         |      |        |         |      |        |         |      |                       |         |      |       |          |        |

| MANUKAU CITY COUNCIL REFUSE AND RECYCLING SERVICES |   |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
|--|---|---------------|------|-------|-------|------|------|-----|------|-----------|------|-------|------|-------------------|-------|-------|------|-------|------|
| Contract expiry date                               | Processing contract expires June 2022<br>Collection contract expires June 2017  |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| Disposal point(s)                                  | All recycling is taken to the Visy processing plant in Onehunga, Auckland   |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| Annual tonnage                                     | Approximately 30,000 tonnes per annum   |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| Composition  | <p>Due to its operational practices, Visy Recycling is not able to differentiate the composition of the recycling from Manukau and Auckland. The following composition data are for the combined recycling stream, and is based on data from January - June 2009.</p> <table border="1"> <tbody> <tr> <td>Mixed Plastic</td> <td>2.3%</td> </tr> <tr> <td>Glass</td> <td>39.5%</td> </tr> <tr> <td>HDPE</td> <td>0.9%</td> </tr> <tr> <td>PET</td> <td>1.3%</td> </tr> <tr> <td>Aluminium</td> <td>0.3%</td> </tr> <tr> <td>Steel</td> <td>2.0%</td> </tr> <tr> <td>Paper &amp; Cardboard</td> <td>49.2%</td> </tr> <tr> <td>Waste</td> <td>4.5%</td> </tr> <tr> <td>Total</td> <td>100%</td> </tr> </tbody> </table> | Mixed Plastic | 2.3% | Glass | 39.5% | HDPE | 0.9% | PET | 1.3% | Aluminium | 0.3% | Steel | 2.0% | Paper & Cardboard | 49.2% | Waste | 4.5% | Total | 100% |
| Mixed Plastic                                      | 2.3%  |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| Glass  | 39.5%   |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| HDPE   | 0.9%  |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| PET  | 1.3%  |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| Aluminium  | 0.3%  |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| Steel  | 2.0%  |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| Paper & Cardboard                                  | 49.2%   |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| Waste  | 4.5%  |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| Total  | 100%  |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| MANUKAU CITY COUNCIL INORGANIC REFUSE COLLECTION   |   |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| Service description                                | Council provides an annual kerbside collection of inorganic refuse to all residents.  |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| Contractor(s)                                      | Collection of inorganic refuse by Alpha Refuse Collections Ltd.   |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| Contract expiry date                               | Collection contract expires December 2012.  |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| Disposal point(s)                                  | All inorganic refuse collected by Council is disposed of at Whitford Landfill.  |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| Annual tonnage                                     | Approximately 11,500 tonnes for year to June 2008   |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| OTHER MANUKAU CITY COUNCIL COLLECTION SERVICES     |   |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| Litter etc.  | A range of Council contracts provide for the collection of litter from the roadside, walkways, street gardens, shopping areas and from litter bins throughout the City and for the collection of illegally dumped refuse.   |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| MANUKAU CITY TRANSFER STATIONS/LANDFILLS           |   |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| Description  | <p>Waste Disposal Services is an equal-interest unincorporated joint venture between Manukau City Council and Waste Management, a division of Transpacific Industries Group (NZ) Ltd.</p> <p>Waste Disposal Services operates the East Tamaki transfer station and Whitford Sanitary Landfill.</p>  |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |
| Annual tonnage                                     | No data relating to the annual tonnage of waste received at either East Tamaki transfer station or Whitford Landfill is in the public domain. Resource consent conditions specify that the maximum quantity of refuse disposed of at the Whitford Landfill is 200,000 tonnes averaged over any five year period, provided that in any single year during that five year period the maximum  |               |      |       |       |      |      |     |      |           |      |       |      |                   |       |       |      |       |      |

MANUKAU CITY COUNCIL REFUSE AND RECYCLING SERVICES

quantity of refuse does not exceed 210,000 tonnes.

Composition

As a condition of its resource consents with ARC, Whitford Landfill is required to undertake an analysis of the composition of waste being discharged at the facility every five years (every three years up until 2006). The primary composition for waste discharged at Whitford Landfill during the survey period in 2006 (the most recent survey) is given in the table below. The survey was undertaken by Waste Not Consulting.

| Composition of overall waste to Whitford Landfill<br>October 2005 – September 2006 | % of total |
|--|------------|
| Paper  | 17.2%      |
| Plastics   | 15.3%      |
| Putrescibles   | 29.3%      |
| Ferrous metals   | 4.7%       |
| Non-ferrous metals   | 0.6%       |
| Glass  | 3.4%       |
| Textiles   | 4.0%       |
| Nappies & sanitary   | 5.6%       |
| Rubble & concrete  | 5.0%       |
| Timber   | 12.6%      |
| Rubber   | 0.4%       |
| Potentially hazardous  | 1.9%       |
| TOTAL  | 100%       |

| NORTH SHORE CITY COUNCIL REFUSE AND RECYCLING SERVICES AND WASTE DATA |   |                  |   |            |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
|---|---|------------------|---|------------|---|--|-------|------|---------|---------|------------|----------|-------|---------|---------|------------|--------------|-------|---------|---------|------------|----------------|------|---------|---------|------------|--------------------|------|---------|---------|------------|-------|------|---------|---------|------------|----------|------|---------|---------|------------|--------------------|-------|---------|---------|------------|------------------|------|---------|---------|------------|--------|------|---------|---------|------------|--------|------|---------|---------|------------|-----------------------|------|---------|---------|------------|-------|--------|--|---------|------------|
| NORTH SHORE CITY COUNCIL DOMESTIC KERBSIDE REFUSE COLLECTION          |   |                  |   |            |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Service description   | Weekly collection of user-pays bags.  |                  |   |            |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Contractor(s)   | Collection contract held by Onyx Group Ltd<br>Refuse disposal contract with Transpacific Industries Group (NZ) Ltd (Redvale Landfill)   |                  |   |            |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Contract expiry date  | Collection contract expires July 2015<br>Disposal contract expires 2015 Refuse disposal contract with Transpacific Industries Group (NZ) Ltd (Redvale Landfill)   |                  |   |            |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Disposal point(s)   | All refuse taken to Redvale Landfill  |                  |   |            |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Annual tonnage  | Approximately 20,000 tonnes per year  |                  |   |            |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Market share  | Approximately 65% by weight. Remainder of kerbside refuse collected by private waste operators using wheelie bins.  |                  |   |            |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Composition   | <p>Composition audits are undertaken regularly by Waste Not Consulting. The primary composition from May 2009 is given below. The mean wt. per household is the average weight set out by a household when it sets bags out for collection.</p> <table border="1"> <thead> <tr> <th>Primary category</th> <th colspan="2">Proportion of total<br/>(95% confidence level)</th> <th colspan="2">Mean wt / household<br/>(95% confidence level)</th> </tr> </thead> <tbody> <tr> <td>Paper</td> <td>9.6%</td> <td>(±0.8%)</td> <td>0.85 kg</td> <td>(±0.07 kg)</td> </tr> <tr> <td>Plastics</td> <td>14.0%</td> <td>(±0.6%)</td> <td>1.23 kg</td> <td>(±0.05 kg)</td> </tr> <tr> <td>Putrescibles</td> <td>53.2%</td> <td>(±4.0%)</td> <td>4.66 kg</td> <td>(±0.35 kg)</td> </tr> <tr> <td>Ferrous metals</td> <td>1.1%</td> <td>(±0.2%)</td> <td>0.10 kg</td> <td>(±0.02 kg)</td> </tr> <tr> <td>Non-ferrous metals</td> <td>0.8%</td> <td>(±0.2%)</td> <td>0.07 kg</td> <td>(±0.02 kg)</td> </tr> <tr> <td>Glass</td> <td>1.8%</td> <td>(±0.5%)</td> <td>0.16 kg</td> <td>(±0.05 kg)</td> </tr> <tr> <td>Textiles</td> <td>2.3%</td> <td>(±0.5%)</td> <td>0.20 kg</td> <td>(±0.04 kg)</td> </tr> <tr> <td>Nappies &amp; sanitary</td> <td>15.4%</td> <td>(±2.3%)</td> <td>1.35 kg</td> <td>(±0.20 kg)</td> </tr> <tr> <td>Rubble, concrete</td> <td>0.4%</td> <td>(±0.2%)</td> <td>0.04 kg</td> <td>(±0.02 kg)</td> </tr> <tr> <td>Timber</td> <td>0.3%</td> <td>(±0.2%)</td> <td>0.03 kg</td> <td>(±0.01 kg)</td> </tr> <tr> <td>Rubber</td> <td>0.1%</td> <td>(±0.0%)</td> <td>0.01 kg</td> <td>(±0.00 kg)</td> </tr> <tr> <td>Potentially hazardous</td> <td>0.9%</td> <td>(±0.3%)</td> <td>0.08 kg</td> <td>(±0.02 kg)</td> </tr> <tr> <td>Total</td> <td>100.0%</td> <td></td> <td>8.77 kg</td> <td>(±0.39 kg)</td> </tr> </tbody> </table> | Primary category | Proportion of total<br>(95% confidence level) |            | Mean wt / household<br>(95% confidence level) |  | Paper | 9.6% | (±0.8%) | 0.85 kg | (±0.07 kg) | Plastics | 14.0% | (±0.6%) | 1.23 kg | (±0.05 kg) | Putrescibles | 53.2% | (±4.0%) | 4.66 kg | (±0.35 kg) | Ferrous metals | 1.1% | (±0.2%) | 0.10 kg | (±0.02 kg) | Non-ferrous metals | 0.8% | (±0.2%) | 0.07 kg | (±0.02 kg) | Glass | 1.8% | (±0.5%) | 0.16 kg | (±0.05 kg) | Textiles | 2.3% | (±0.5%) | 0.20 kg | (±0.04 kg) | Nappies & sanitary | 15.4% | (±2.3%) | 1.35 kg | (±0.20 kg) | Rubble, concrete | 0.4% | (±0.2%) | 0.04 kg | (±0.02 kg) | Timber | 0.3% | (±0.2%) | 0.03 kg | (±0.01 kg) | Rubber | 0.1% | (±0.0%) | 0.01 kg | (±0.00 kg) | Potentially hazardous | 0.9% | (±0.3%) | 0.08 kg | (±0.02 kg) | Total | 100.0% |  | 8.77 kg | (±0.39 kg) |
| Primary category  | Proportion of total<br>(95% confidence level)   |                  | Mean wt / household<br>(95% confidence level) |            |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Paper   | 9.6%  | (±0.8%)          | 0.85 kg                                       | (±0.07 kg) |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Plastics  | 14.0%   | (±0.6%)          | 1.23 kg                                       | (±0.05 kg) |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Putrescibles  | 53.2%   | (±4.0%)          | 4.66 kg                                       | (±0.35 kg) |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Ferrous metals  | 1.1%  | (±0.2%)          | 0.10 kg                                       | (±0.02 kg) |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Non-ferrous metals  | 0.8%  | (±0.2%)          | 0.07 kg                                       | (±0.02 kg) |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Glass   | 1.8%  | (±0.5%)          | 0.16 kg                                       | (±0.05 kg) |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Textiles  | 2.3%  | (±0.5%)          | 0.20 kg                                       | (±0.04 kg) |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Nappies & sanitary  | 15.4%   | (±2.3%)          | 1.35 kg                                       | (±0.20 kg) |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Rubble, concrete  | 0.4%  | (±0.2%)          | 0.04 kg                                       | (±0.02 kg) |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Timber  | 0.3%  | (±0.2%)          | 0.03 kg                                       | (±0.01 kg) |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Rubber  | 0.1%  | (±0.0%)          | 0.01 kg                                       | (±0.00 kg) |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Potentially hazardous   | 0.9%  | (±0.3%)          | 0.08 kg                                       | (±0.02 kg) |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Total   | 100.0%  |                  | 8.77 kg                                       | (±0.39 kg) |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| NORTH SHORE CITY COUNCIL DOMESTIC KERBSIDE RECYCLING COLLECTION       |   |                  |   |            |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Service description   | Fortnightly collection of 140-litre recycling wheelie bin. Materials accepted include plastic bottles and containers, glass bottles and jars, and steel and aluminium cans.<br>Separate fortnightly collection of bundled paper and cardboard.  |                  |   |            |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Contractor(s)   | Onyx Group Ltd  |                  |   |            |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |
| Contract  | July 2015   |                  |   |            |   |  |       |      |         |         |            |          |       |         |         |            |              |       |         |         |            |                |      |         |         |            |                    |      |         |         |            |       |      |         |         |            |          |      |         |         |            |                    |       |         |         |            |                  |      |         |         |            |        |      |         |         |            |        |      |         |         |            |                       |      |         |         |            |       |        |  |         |            |

| NORTH SHORE CITY COUNCIL REFUSE AND RECYCLING SERVICES AND WASTE DATA |  |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
|---|--|------------|------|----------------|------|-----|------|------|------|----------------|------|-------|-------|-------|-------|---------------|------|-------|--------|
| expiry date   |  |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| Disposal point(s)   | All materials are taken to Onyx sorting facility at Waitakere transfer station.  |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| Annual tonnage  | Approximately 23500 tonnes per year, all materials combined  |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| Composition   | <p>The composition of the kerbside recycling collection is reported regularly to Council by the processor. The annual composition to June 09 is given in the table below.</p> <table border="1"> <tbody> <tr> <td>Steel Cans</td> <td>3.1%</td> </tr> <tr> <td>Aluminium Cans</td> <td>0.6%</td> </tr> <tr> <td>PET</td> <td>2.3%</td> </tr> <tr> <td>HDPE</td> <td>2.1%</td> </tr> <tr> <td>Other Plastics</td> <td>1.7%</td> </tr> <tr> <td>Paper</td> <td>51.8%</td> </tr> <tr> <td>Glass</td> <td>35.1%</td> </tr> <tr> <td>Contamination</td> <td>3.2%</td> </tr> <tr> <td>Total</td> <td>100.0%</td> </tr> </tbody> </table> | Steel Cans | 3.1% | Aluminium Cans | 0.6% | PET | 2.3% | HDPE | 2.1% | Other Plastics | 1.7% | Paper | 51.8% | Glass | 35.1% | Contamination | 3.2% | Total | 100.0% |
| Steel Cans  | 3.1%   |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| Aluminium Cans  | 0.6%   |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| PET   | 2.3%   |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| HDPE  | 2.1%   |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| Other Plastics  | 1.7%   |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| Paper   | 51.8%  |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| Glass   | 35.1%  |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| Contamination   | 3.2%   |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| Total   | 100.0%   |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| NORTH SHORE CITY COUNCIL INORGANIC REFUSE COLLECTION                  |  |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| Service description   | Council provides an annual inorganic refuse kerbside collection to each property. The collection takes place over a 20 week period between July and November. Scrap metal is recovered from the material by the contractor before it is collected (estimated at 250 tonnes per year).  |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| Contractor(s)   | Onyx Group Ltd   |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| Contract expiry date  | July 2015  |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| Disposal point(s)   | All refuse is taken directly to Redvale Landfill.  |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| Annual tonnage  | Approximately 3800 tonnes of inorganic refuse is collected each year. About 250 tonnes of scrap is collected each year.  |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| Composition   | Composition data are not collected.  |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| OTHER COUNCIL COLLECTION SERVICES                                     |  |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| Service description   | As part of its ten-year contract, Onyx Group provides refuse and recycling collections to commercial premises. These are on a differing service level than to residential properties.  |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| Service description   | Public place litter removal and cleaning is contracted to Techscope Ltd  |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| NORTH SHORE CITY TRANSFER STATIONS/LANDFILLS                          |  |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |
| Description   | Council owns the Devonport transfer station, and contracts its operation to Living Earth Ltd. Constellation Drive transfer station is owned and operated by EnviroWaste Services Ltd. Rosedale Rd Transfer station is owned by   |            |      |                |      |     |      |      |      |                |      |       |       |       |       |               |      |       |        |

NORTH SHORE CITY COUNCIL REFUSE AND RECYCLING SERVICES AND WASTE DATA

Transpacific Industries

NORTH SHORE CITY DATA FROM LICENSED COLLECTORS

Under the North Shore City Solid Waste Management and Minimisation Bylaw 2005 waste collectors, included those contracted to Council, must be licensed by Council and report regularly on the quantity and type of waste collected. The following data for North Shore City have been annualised from data for an 11-month period, July 08-May 09.

| Waste type            | Tonnes per annum |
|-----------------------|------------------|
| 01 Household          | 30468            |
| 02 Recyclables        | 20919            |
| 03 Green Waste        | 12012            |
| 04 Paper waste        | 12353            |
| 05 Inorganic          | 4305             |
| 07 Hazardous          | 956              |
| 08 Commercial total   | 24170            |
| 08a Building          | 8181             |
| 08b Hospitality       | 2764             |
| 08c Manufacturing     | 21130            |
| 08d Retail            | 1923             |
| 08e Admin / Education | 5399             |
| 08f Agricultural      | 401              |
| 08g Litter waste      | 33               |
| 08h Household         | 986              |
| Total                 | 146,001          |

| PAPAKURA DISTRICT COUNCIL REFUSE AND RECYCLING SERVICES          |  |                   |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
|--|--|-------------------|---------------------|-------------------|-------|-------|---------|----------|-------|---------|--------------|-------|---------|----------------|------|---------|--------------------|------|---------|-------|------|---------|----------|------|---------|--------------------|-------|---------|------------------------|------|---------|--------|------|---------|--------|------|---------|-----------------------|------|---------|-------|------|---------|
| PAPAKURA DISTRICT COUNCIL DOMESTIC KERBSIDE REFUSE COLLECTION    |  |                   |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Service description  | Weekly collection of user-pays bags.   |                   |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Contractor(s)  | Waste Management, a division of Transpacific Industries Group (NZ) Ltd   |                   |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Contract expiry date   | 30 June 2010 with 1-year option for renewal  |                   |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Disposal point(s)  | Papakura transfer station, transported to Hampton Downs Landfill   |                   |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Annual tonnage   | 5,982 tonnes to June 2009  |                   |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Market share   | Approximately 80% by weight. The remainder of residents use private waste operators' wheelie bin services.   |                   |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Composition  | <p>Composition audits are undertaken regularly by Waste Not Consulting. The primary composition from October 2007 is given below. The mean wt. per household is the average weight set out by a household when it sets bags out for collection.</p> <table border="1"> <thead> <tr> <th>Primary category</th> <th>Proportion of total</th> <th>Mean wt/household</th> </tr> </thead> <tbody> <tr> <td>Paper</td> <td>14.1%</td> <td>1.37 kg</td> </tr> <tr> <td>Plastics</td> <td>13.3%</td> <td>1.30 kg</td> </tr> <tr> <td>Putrescibles</td> <td>48.2%</td> <td>4.71 kg</td> </tr> <tr> <td>Ferrous metals</td> <td>1.9%</td> <td>0.19 kg</td> </tr> <tr> <td>Non-ferrous metals</td> <td>0.9%</td> <td>0.08 kg</td> </tr> <tr> <td>Glass</td> <td>3.3%</td> <td>0.32 kg</td> </tr> <tr> <td>Textiles</td> <td>4.4%</td> <td>0.43 kg</td> </tr> <tr> <td>Nappies &amp; sanitary</td> <td>11.1%</td> <td>1.09 kg</td> </tr> <tr> <td>Rubble, concrete, etc.</td> <td>1.1%</td> <td>0.11 kg</td> </tr> <tr> <td>Timber</td> <td>0.3%</td> <td>0.03 kg</td> </tr> <tr> <td>Rubber</td> <td>0.2%</td> <td>0.02 kg</td> </tr> <tr> <td>Potentially hazardous</td> <td>1.2%</td> <td>0.12 kg</td> </tr> <tr> <td>TOTAL</td> <td>100%</td> <td>9.77 kg</td> </tr> </tbody> </table> | Primary category  | Proportion of total | Mean wt/household | Paper | 14.1% | 1.37 kg | Plastics | 13.3% | 1.30 kg | Putrescibles | 48.2% | 4.71 kg | Ferrous metals | 1.9% | 0.19 kg | Non-ferrous metals | 0.9% | 0.08 kg | Glass | 3.3% | 0.32 kg | Textiles | 4.4% | 0.43 kg | Nappies & sanitary | 11.1% | 1.09 kg | Rubble, concrete, etc. | 1.1% | 0.11 kg | Timber | 0.3% | 0.03 kg | Rubber | 0.2% | 0.02 kg | Potentially hazardous | 1.2% | 0.12 kg | TOTAL | 100% | 9.77 kg |
| Primary category   | Proportion of total  | Mean wt/household |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Paper  | 14.1%  | 1.37 kg           |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Plastics   | 13.3%  | 1.30 kg           |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Putrescibles   | 48.2%  | 4.71 kg           |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Ferrous metals   | 1.9%   | 0.19 kg           |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Non-ferrous metals   | 0.9%   | 0.08 kg           |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Glass  | 3.3%   | 0.32 kg           |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Textiles   | 4.4%   | 0.43 kg           |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Nappies & sanitary   | 11.1%  | 1.09 kg           |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Rubble, concrete, etc.   | 1.1%   | 0.11 kg           |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Timber   | 0.3%   | 0.03 kg           |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Rubber   | 0.2%   | 0.02 kg           |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Potentially hazardous  | 1.2%   | 0.12 kg           |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| TOTAL  | 100%   | 9.77 kg           |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| PAPAKURA DISTRICT COUNCIL DOMESTIC KERBSIDE RECYCLING COLLECTION |  |                   |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Service description  | <p>A weekly kerbside recycling collection is funded through general rates. A 45- or 55 L litre open crate is supplied to residents for setting out plastic containers, glass bottles and jars, and aluminium and steel cans.</p> <p>A weekly kerbside collection of paper and cardboard is also provided by Council.</p>   |                   |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Contractor   | Smart Environmental Ltd collects both recyclable containers and paper and cardboard.   |                   |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Contract expiry date   | 31 August 2010, with 1-year option for renewal   |                   |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Disposal   | All recyclables are processed at the contractors processing facility.  |                   |                     |                   |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |       |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |

| PAPAKURA DISTRICT COUNCIL REFUSE AND RECYCLING SERVICES |   |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
|---|---|------------|----------------|------------------|------|---------------|------|------------------|------|------------|------|-----------------|-------|-------|-------|---------------|------|-------|--------|
| point(s)  |   |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| Annual tonnage  | 4,411 tonnes to June 2009   |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| Composition   | <p>From information provided by the contractor, the composition of the kerbside recycling is as follows:</p> <table border="1"> <tbody> <tr> <td>HDPE</td> <td>1.7%</td> </tr> <tr> <td>PET</td> <td>2.2%</td> </tr> <tr> <td>Mixed plastic</td> <td>0.6%</td> </tr> <tr> <td>Aluminium cans</td> <td>0.4%</td> </tr> <tr> <td>Steel cans</td> <td>2.1%</td> </tr> <tr> <td>Paper/cardboard</td> <td>43.1%</td> </tr> <tr> <td>Glass</td> <td>48.6%</td> </tr> <tr> <td>Contamination</td> <td>1.4%</td> </tr> <tr> <td>Total</td> <td>100.0%</td> </tr> </tbody> </table>            | HDPE       | 1.7%           | PET              | 2.2% | Mixed plastic | 0.6% | Aluminium cans   | 0.4% | Steel cans | 2.1% | Paper/cardboard | 43.1% | Glass | 48.6% | Contamination | 1.4% | Total | 100.0% |
| HDPE  | 1.7%  |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| PET   | 2.2%  |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| Mixed plastic   | 0.6%  |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| Aluminium cans  | 0.4%  |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| Steel cans  | 2.1%  |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| Paper/cardboard   | 43.1%   |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| Glass   | 48.6%   |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| Contamination   | 1.4%  |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| Total   | 100.0%  |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| PAPAKURA DISTRICT COUNCIL INORGANIC REFUSE COLLECTION   |   |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| Service description                                     | Council provides an annual kerbside collection of inorganic refuse from residential properties.   |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| Contractor(s)   | Most recent contract to Waste Management  |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| Contract expiry date                                    | Annual contracts only   |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| Disposal point(s)                                       | Papakura Transfer station to Hampton Downs  |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| Annual tonnage  | 1397 tonnes in 2008, of which 1299 tonnes were landfilled and 98 tonnes recovered   |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| Composition   | Composition data on landfilled waste is not collected.  |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| PAPAKURA DISTRICT OTHER COUNCIL COLLECTION SERVICES     |   |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| Litter etc.   | <p>A range of Council contracts provide for the collection of litter from the roadside, walkways, street gardens, shopping areas and from litter bins throughout the City and for the collection of illegally dumped refuse. Contracted to Waste Management as part of refuse and litter services contract.</p> <table border="1"> <thead> <tr> <th>Waste type</th> <th>Tonnes 2008-09</th> </tr> </thead> <tbody> <tr> <td>Litter From Bins</td> <td>247</td> </tr> <tr> <td>Loose Litter</td> <td>56</td> </tr> <tr> <td>Illegally Dumped</td> <td>319</td> </tr> </tbody> </table> | Waste type | Tonnes 2008-09 | Litter From Bins | 247  | Loose Litter  | 56   | Illegally Dumped | 319  |            |      |                 |       |       |       |               |      |       |        |
| Waste type  | Tonnes 2008-09  |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| Litter From Bins  | 247   |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| Loose Litter  | 56  |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| Illegally Dumped  | 319   |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| PAPAKURA DISTRICT TRANSFER STATIONS/LANDFILLS           |   |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |
| Description   | Council does not own or operate any disposal facilities. There is a single transfer station in Papakura, on Inlet Road, owned and operated by Waste Management.   |            |                |                  |      |               |      |                  |      |            |      |                 |       |       |       |               |      |       |        |

**RODNEY DISTRICT COUNCIL REFUSE AND RECYCLING SERVICES AND WASTE DATA**

**RODNEY DISTRICT COUNCIL DOMESTIC KERBSIDE REFUSE COLLECTION**

| Service description    | Council does not provide a kerbside refuse collection to residents except in a small number of remote locations where it subsidises the collection by private waste operators. All kerbside refuse services are provided by five private waste operators.  |                    |  |                  |                     |                    |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
|------------------------|--|--------------------|--|------------------|---------------------|--------------------|-------|-------|---------|----------|-------|---------|--------------|-------|---------|----------------|------|---------|--------------------|------|---------|-------|------|---------|----------|------|---------|--------------------|------|---------|------------------------|------|---------|--------|------|---------|--------|------|---------|-----------------------|------|---------|-------|------|---------|
| Disposal points        | Domestic kerbside refuse from Rodney District is disposed of at Waitakere transfer station, Constellation Drive transfer station, Warkworth transfer station, Silverdale Transfer Station, and directly to Redvale Landfill. All of the refuse is ultimately disposed of at Redvale Landfill.  |                    |  |                  |                     |                    |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Annual tonnage         | Approximately 15,000 tonnes of domestic kerbside refuse were generated in Rodney District, according to a 2005 study by Waste Not Consulting. Based on a population increase of 4%, an estimate of 15650 tonnes per annum is made for 2008/09.   |                    |  |                  |                     |                    |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Composition            | <p>A SWAP audit of private domestic kerbside collections by Waste Not Consulting in 2005 determined the composition to be as shown in the table. The survey included both bagged refuse and wheelie bin refuse in proportions similar to that in the District as a whole. The mean wt. per household is the average weight set out by a household when it sets bags out for collection.</p> <table border="1"> <thead> <tr> <th>Primary category</th> <th>Proportion of total</th> <th>Mean wt/ household</th> </tr> </thead> <tbody> <tr> <td>Paper</td> <td>16.5%</td> <td>1.63 kg</td> </tr> <tr> <td>Plastics</td> <td>13.8%</td> <td>1.37 kg</td> </tr> <tr> <td>Putrescibles</td> <td>45.8%</td> <td>4.54 kg</td> </tr> <tr> <td>Ferrous metals</td> <td>2.2%</td> <td>0.22 kg</td> </tr> <tr> <td>Non-ferrous metals</td> <td>1.0%</td> <td>0.10 kg</td> </tr> <tr> <td>Glass</td> <td>3.9%</td> <td>0.39 kg</td> </tr> <tr> <td>Textiles</td> <td>4.1%</td> <td>0.41 kg</td> </tr> <tr> <td>Nappies &amp; sanitary</td> <td>8.6%</td> <td>0.85 kg</td> </tr> <tr> <td>Rubble, concrete, etc.</td> <td>1.4%</td> <td>0.14 kg</td> </tr> <tr> <td>Timber</td> <td>1.1%</td> <td>0.11 kg</td> </tr> <tr> <td>Rubber</td> <td>0.3%</td> <td>0.03 kg</td> </tr> <tr> <td>Potentially hazardous</td> <td>1.2%</td> <td>0.12 kg</td> </tr> <tr> <td>TOTAL</td> <td>100%</td> <td>9.91 kg</td> </tr> </tbody> </table> |                    |  | Primary category | Proportion of total | Mean wt/ household | Paper | 16.5% | 1.63 kg | Plastics | 13.8% | 1.37 kg | Putrescibles | 45.8% | 4.54 kg | Ferrous metals | 2.2% | 0.22 kg | Non-ferrous metals | 1.0% | 0.10 kg | Glass | 3.9% | 0.39 kg | Textiles | 4.1% | 0.41 kg | Nappies & sanitary | 8.6% | 0.85 kg | Rubble, concrete, etc. | 1.4% | 0.14 kg | Timber | 1.1% | 0.11 kg | Rubber | 0.3% | 0.03 kg | Potentially hazardous | 1.2% | 0.12 kg | TOTAL | 100% | 9.91 kg |
| Primary category       | Proportion of total  | Mean wt/ household |  |                  |                     |                    |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Paper                  | 16.5%  | 1.63 kg            |  |                  |                     |                    |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Plastics               | 13.8%  | 1.37 kg            |  |                  |                     |                    |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Putrescibles           | 45.8%  | 4.54 kg            |  |                  |                     |                    |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Ferrous metals         | 2.2%   | 0.22 kg            |  |                  |                     |                    |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Non-ferrous metals     | 1.0%   | 0.10 kg            |  |                  |                     |                    |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Glass                  | 3.9%   | 0.39 kg            |  |                  |                     |                    |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Textiles               | 4.1%   | 0.41 kg            |  |                  |                     |                    |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Nappies & sanitary     | 8.6%   | 0.85 kg            |  |                  |                     |                    |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Rubble, concrete, etc. | 1.4%   | 0.14 kg            |  |                  |                     |                    |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Timber                 | 1.1%   | 0.11 kg            |  |                  |                     |                    |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Rubber                 | 0.3%   | 0.03 kg            |  |                  |                     |                    |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| Potentially hazardous  | 1.2%   | 0.12 kg            |  |                  |                     |                    |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |
| TOTAL                  | 100%   | 9.91 kg            |  |                  |                     |                    |       |       |         |          |       |         |              |       |         |                |      |         |                    |      |         |       |      |         |          |      |         |                    |      |         |                        |      |         |        |      |         |        |      |         |                       |      |         |       |      |         |

**RODNEY DISTRICT COUNCIL DOMESTIC KERBSIDE RECYCLING COLLECTION**

|                      |  |
|----------------------|--|
| Service description  | The rates-funded kerbside recycling service is available to all households, businesses and schools in the Rodney District. Urban household receive 55-litre bins which are collected weekly. Rural households receive 70-litre bins which are collected fortnightly. |
| Contractor(s)        | Smart Environmental Ltd  |
| Contract expiry date | June 2013  |
| Disposal             | Visy Recycling's processing facility in Onehunga   |

| RODNEY DISTRICT COUNCIL REFUSE AND RECYCLING SERVICES AND WASTE DATA |  |            |                  |                |      |                |      |                 |     |       |     |       |      |
|--|--|------------|------------------|----------------|------|----------------|------|-----------------|-----|-------|-----|-------|------|
| point(s)   |  |            |                  |                |      |                |      |                 |     |       |     |       |      |
| Annual tonnage   | Approximately 8,050 T/annum  |            |                  |                |      |                |      |                 |     |       |     |       |      |
| Composition  | <p>From information provided by the contractor, the composition of the kerbside recycling is as shown in the table.</p> <table border="1"> <tbody> <tr> <td>Plastic</td> <td>9.5%</td> </tr> <tr> <td>Aluminium cans</td> <td>0.5%</td> </tr> <tr> <td>Steel cans</td> <td>3.0%</td> </tr> <tr> <td>Paper/cardboard</td> <td>39%</td> </tr> <tr> <td>Glass</td> <td>48%</td> </tr> <tr> <td>Total</td> <td>100%</td> </tr> </tbody> </table>   | Plastic    | 9.5%             | Aluminium cans | 0.5% | Steel cans     | 3.0% | Paper/cardboard | 39% | Glass | 48% | Total | 100% |
| Plastic  | 9.5%   |            |                  |                |      |                |      |                 |     |       |     |       |      |
| Aluminium cans   | 0.5%   |            |                  |                |      |                |      |                 |     |       |     |       |      |
| Steel cans   | 3.0%   |            |                  |                |      |                |      |                 |     |       |     |       |      |
| Paper/cardboard  | 39%  |            |                  |                |      |                |      |                 |     |       |     |       |      |
| Glass  | 48%  |            |                  |                |      |                |      |                 |     |       |     |       |      |
| Total  | 100%   |            |                  |                |      |                |      |                 |     |       |     |       |      |
| RODNEY DISTRICT COUNCIL INORGANIC REFUSE COLLECTION                  |  |            |                  |                |      |                |      |                 |     |       |     |       |      |
|  | Council does not provide an inorganic refuse collection to residents.  |            |                  |                |      |                |      |                 |     |       |     |       |      |
| OTHER RODNEY DISTRICT COUNCIL COLLECTION SERVICES                    |  |            |                  |                |      |                |      |                 |     |       |     |       |      |
| Recycling depot  | Council operates the Whangaparaoa Recycling Depot  |            |                  |                |      |                |      |                 |     |       |     |       |      |
| Litter bins etc.   | A range of Council contracts provide for the collection of litter from the roadside, walkways, street gardens, shopping areas and from litter bins throughout the District and for the collection of illegally dumped refuse. Public place litter bin collection is contracted to Metrowaste   |            |                  |                |      |                |      |                 |     |       |     |       |      |
| Hazardous waste  | Council provides two hazardous waste drop-off facilities for the free disposal of household hazardous waste. These are located at the Lawrie Rd Transfer Station and Silverdale Transfer Station.  |            |                  |                |      |                |      |                 |     |       |     |       |      |
| RODNEY DISTRICT TRANSFER STATIONS/LANDFILLS                          |  |            |                  |                |      |                |      |                 |     |       |     |       |      |
| Transfer stations  | There are four transfer stations in Rodney District – Helensville, Silverdale, Wellsford, and Lawries Road, near Warkworth. Helensville is Council-owned and operated. Wellsford and Lawries Road are on Council-owned land leased to Mason Contractors, and Silverdale is privately owned and operated by Metropolitan Waste. All refuse from the transfer stations is disposed of at Redvale Landfill, with the Mason Contractors refuse first being discharged at Constellation Drive transfer station.   |            |                  |                |      |                |      |                 |     |       |     |       |      |
| Landfills  | The only active landfill in Rodney District is Redvale Landfill, owned and operated by Transpacific Industries Group (NZ) Ltd.   |            |                  |                |      |                |      |                 |     |       |     |       |      |
| RODNEY DISTRICT DATA FROM LICENSED COLLECTORS                        |  |            |                  |                |      |                |      |                 |     |       |     |       |      |
|  | <p>Under the Rodney District Council Waste Bylaw 2005 all waste collectors must be licensed by Council and report regularly to Council on the quantity and type of waste collected. The following data for Rodney District have been annualised from data for an 11-month period, July 08-May 09. The dataset is not complete, as data from one of the waste operators had not been supplied for part of the period</p> <table border="1"> <thead> <tr> <th>Waste type</th> <th>Tonnes per annum</th> </tr> </thead> <tbody> <tr> <td>01 Household</td> <td>6278</td> </tr> <tr> <td>02 Recyclables</td> <td>3206</td> </tr> <tr> <td>03 Green Waste</td> <td>967</td> </tr> </tbody> </table> | Waste type | Tonnes per annum | 01 Household   | 6278 | 02 Recyclables | 3206 | 03 Green Waste  | 967 |       |     |       |      |
| Waste type   | Tonnes per annum   |            |                  |                |      |                |      |                 |     |       |     |       |      |
| 01 Household   | 6278   |            |                  |                |      |                |      |                 |     |       |     |       |      |
| 02 Recyclables   | 3206   |            |                  |                |      |                |      |                 |     |       |     |       |      |
| 03 Green Waste   | 967  |            |                  |                |      |                |      |                 |     |       |     |       |      |

RODNEY DISTRICT COUNCIL REFUSE AND RECYCLING SERVICES AND WASTE DATA

|  |                       |        |
|--|-----------------------|--------|
|  | 04 Paper waste        | 748    |
|  | 05 Inorganic          | 1193   |
|  | 07 Hazardous          | 2567   |
|  | 08 Commercial total   | 2618   |
|  | 08a Building          | 5542   |
|  | 08b Hospitality       | 623    |
|  | 08c Manufacturing     | 2808   |
|  | 08d Retail            | 320    |
|  | 08e Admin / Education | 1432   |
|  | 08f Agricultural      | 80     |
|  | 08g Litter waste      | 4      |
|  | 08h Household         | 573    |
|  | Total                 | 28,959 |

| WAITAKERE CITY COUNCIL REFUSE AND RECYCLING SERVICES AND WASTE DATA |   |  |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
|---|---|--|--|--|-------|---------------|--------------------|----------|---------------|--------------------|--------------|---------------|--------------------|----------------|--------------|--------------------|--------------------|--------------|--------------------|-------|--------------|--------------------|----------|--------------|--------------------|--------------------|---------------|--------------------|------------------------|--------------|--------------------|--------|--------------|--------------------|--------|--------------|--------------------|-----------------------|--------------|--------------------|-------|--------|---------------------|
| WAITAKERE CITY COUNCIL DOMESTIC KERBSIDE REFUSE COLLECTION          |   |  |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Service description   | Weekly collection of user-pays bags from urban and rural areas.   |  |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Contractor(s)   | Onyx Group Ltd  |  |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Contract expiry date  | June 2015   |  |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Disposal point(s)   | All refuse taken to Waitakere transfer station  |  |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Annual tonnage  | Approximately 23,000 tonnes per year  |  |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Market share  | Approximately 90% by weight. Remainder of kerbside refuse collected by private waste operators using wheelie bins.  |  |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Composition   | <p>Composition audits are undertaken regularly by Waste Not Consulting. The primary composition from August 2008 is given below. The mean wt. per household is the average weight set out by a household when it sets bags out for collection.</p> <table border="1"> <thead> <tr> <th>Primary category</th> <th>Proportion of total<br/>(margin of error for<br/>95% confidence<br/>interval)</th> <th>Mean wt / household<br/>(margin of error for<br/>95% confidence<br/>interval)</th> </tr> </thead> <tbody> <tr> <td>Paper</td> <td>13.7% (±1.4%)</td> <td>1.39 kg (±0.14 kg)</td> </tr> <tr> <td>Plastics</td> <td>12.5% (±0.5%)</td> <td>1.27 kg (±0.06 kg)</td> </tr> <tr> <td>Putrescibles</td> <td>47.5% (±3.6%)</td> <td>4.81 kg (±0.36 kg)</td> </tr> <tr> <td>Ferrous metals</td> <td>1.1% (±0.2%)</td> <td>0.12 kg (±0.03 kg)</td> </tr> <tr> <td>Non-ferrous metals</td> <td>1.1% (±0.2%)</td> <td>0.11 kg (±0.02 kg)</td> </tr> <tr> <td>Glass</td> <td>1.6% (±0.4%)</td> <td>0.17 kg (±0.04 kg)</td> </tr> <tr> <td>Textiles</td> <td>3.6% (±0.9%)</td> <td>0.36 kg (±0.09 kg)</td> </tr> <tr> <td>Nappies &amp; sanitary</td> <td>15.6% (±2.4%)</td> <td>1.58 kg (±0.25 kg)</td> </tr> <tr> <td>Rubble, concrete, etc.</td> <td>1.1% (±1.1%)</td> <td>0.11 kg (±0.11 kg)</td> </tr> <tr> <td>Timber</td> <td>1.0% (±0.9%)</td> <td>0.10 kg (±0.09 kg)</td> </tr> <tr> <td>Rubber</td> <td>0.2% (±0.1%)</td> <td>0.02 kg (±0.01 kg)</td> </tr> <tr> <td>Potentially hazardous</td> <td>0.9% (±0.3%)</td> <td>0.10 kg (±0.03 kg)</td> </tr> <tr> <td>TOTAL</td> <td>100.0%</td> <td>10.12 kg (±0.45 kg)</td> </tr> </tbody> </table> | Primary category   | Proportion of total<br>(margin of error for<br>95% confidence<br>interval) | Mean wt / household<br>(margin of error for<br>95% confidence<br>interval) | Paper | 13.7% (±1.4%) | 1.39 kg (±0.14 kg) | Plastics | 12.5% (±0.5%) | 1.27 kg (±0.06 kg) | Putrescibles | 47.5% (±3.6%) | 4.81 kg (±0.36 kg) | Ferrous metals | 1.1% (±0.2%) | 0.12 kg (±0.03 kg) | Non-ferrous metals | 1.1% (±0.2%) | 0.11 kg (±0.02 kg) | Glass | 1.6% (±0.4%) | 0.17 kg (±0.04 kg) | Textiles | 3.6% (±0.9%) | 0.36 kg (±0.09 kg) | Nappies & sanitary | 15.6% (±2.4%) | 1.58 kg (±0.25 kg) | Rubble, concrete, etc. | 1.1% (±1.1%) | 0.11 kg (±0.11 kg) | Timber | 1.0% (±0.9%) | 0.10 kg (±0.09 kg) | Rubber | 0.2% (±0.1%) | 0.02 kg (±0.01 kg) | Potentially hazardous | 0.9% (±0.3%) | 0.10 kg (±0.03 kg) | TOTAL | 100.0% | 10.12 kg (±0.45 kg) |
| Primary category  | Proportion of total<br>(margin of error for<br>95% confidence<br>interval)  | Mean wt / household<br>(margin of error for<br>95% confidence<br>interval) |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Paper   | 13.7% (±1.4%)   | 1.39 kg (±0.14 kg)   |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Plastics  | 12.5% (±0.5%)   | 1.27 kg (±0.06 kg)   |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Putrescibles  | 47.5% (±3.6%)   | 4.81 kg (±0.36 kg)   |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Ferrous metals  | 1.1% (±0.2%)  | 0.12 kg (±0.03 kg)   |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Non-ferrous metals  | 1.1% (±0.2%)  | 0.11 kg (±0.02 kg)   |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Glass   | 1.6% (±0.4%)  | 0.17 kg (±0.04 kg)   |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Textiles  | 3.6% (±0.9%)  | 0.36 kg (±0.09 kg)   |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Nappies & sanitary  | 15.6% (±2.4%)   | 1.58 kg (±0.25 kg)   |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Rubble, concrete, etc.  | 1.1% (±1.1%)  | 0.11 kg (±0.11 kg)   |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Timber  | 1.0% (±0.9%)  | 0.10 kg (±0.09 kg)   |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Rubber  | 0.2% (±0.1%)  | 0.02 kg (±0.01 kg)   |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Potentially hazardous   | 0.9% (±0.3%)  | 0.10 kg (±0.03 kg)   |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| TOTAL   | 100.0%  | 10.12 kg (±0.45 kg)  |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| WAITAKERE CITY COUNCIL DOMESTIC KERBSIDE RECYCLING COLLECTION       |   |  |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Service description   | Fortnightly collection of 140-litre recycling wheelie bin. Materials accepted include plastic bottles and containers with recycling symbols #1-7 (excluding expanded polystyrene), glass bottles and jars, and steel and aluminium cans. Separate fortnightly collection of bundled paper and cardboard.  |  |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Contractor(s)   | Onyx Group Ltd  |  |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |
| Contract expiry date  | June 2015   |  |  |  |       |               |                    |          |               |                    |              |               |                    |                |              |                    |                    |              |                    |       |              |                    |          |              |                    |                    |               |                    |                        |              |                    |        |              |                    |        |              |                    |                       |              |                    |       |        |                     |

| WAITAKERE CITY COUNCIL REFUSE AND RECYCLING SERVICES AND WASTE DATA |   |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
|---|---|-----------------------|------|------------------------|------|-----------------|------|----------------|------|------------|------|-------|-------|---------------------|-------|-------|--------|
| Disposal point(s)   | All materials are taken to Onyx sorting facility at Waitakere transfer station.   |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| Annual tonnage  | 18,000 tonnes per year  |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| Composition   | <p>The composition of the kerbside recycling collection is reported regularly to Council by the processor. The annual composition to June 2009 is given in the table below.</p> <table border="1"> <tbody> <tr> <td>Plastic 1 PET bottles</td> <td>2.9%</td> </tr> <tr> <td>Plastic 2 HDPE bottles</td> <td>2.6%</td> </tr> <tr> <td>Plastic# 1 to 7</td> <td>2.4%</td> </tr> <tr> <td>Aluminium Cans</td> <td>0.9%</td> </tr> <tr> <td>Steel Cans</td> <td>4.1%</td> </tr> <tr> <td>Glass</td> <td>45.5%</td> </tr> <tr> <td>Paper and cardboard</td> <td>41.6%</td> </tr> <tr> <td>Total</td> <td>100.0%</td> </tr> </tbody> </table> | Plastic 1 PET bottles | 2.9% | Plastic 2 HDPE bottles | 2.6% | Plastic# 1 to 7 | 2.4% | Aluminium Cans | 0.9% | Steel Cans | 4.1% | Glass | 45.5% | Paper and cardboard | 41.6% | Total | 100.0% |
| Plastic 1 PET bottles   | 2.9%  |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| Plastic 2 HDPE bottles  | 2.6%  |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| Plastic# 1 to 7   | 2.4%  |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| Aluminium Cans  | 0.9%  |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| Steel Cans  | 4.1%  |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| Glass   | 45.5%   |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| Paper and cardboard   | 41.6%   |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| Total   | 100.0%  |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| WAITAKERE CITY COUNCIL INORGANIC REFUSE COLLECTION                  |   |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| Service description   | Council provides for a single, pre-paid pre-booked inorganic collection per property per year.  |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| Contractor(s)   | Onyx Group Ltd  |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| Contract expiry date  | June 2010 (initial term)  |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| Disposal point(s)   | Waitakere transfer station  |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| Annual tonnage  | As of writing, the service has only been in operation for a short period of time, and tonnage information is not available.   |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| Composition   | Composition has not as yet been measured.   |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| OTHER WAITAKERE CITY SERVICES                                       |   |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| Waste transport   | Waste transport from Waitakere transfer station to Redvale Landfill is contracted to Smith & Davies under a contract that expires in 2011.  |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| Waste disposal  | Landfill disposal of waste from Waitakere transfer station is contracted to Waste Management (Redvale Landfill) under a contract that expires in 2014.  |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| Recycling Collection  | The businesses in the City are also provided with a fortnightly recycling collection service for non-trade waste recycling items  |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| Litter, etc.  | A range of Council contracts provide for the collection of litter from the roadside, walkways, street gardens, shopping areas and from litter bins throughout the City and for the collection of illegally dumped refuse and stream cleaning  |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| Commercial bag collections  | Commercial premises are provided with a daily refuse collection three times per week, using the Council's prepaid bags. The service is contracted to Onyx Group Ltd.  |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| WAITAKERE CITY TRANSFER STATIONS/LANDFILLS                          |   |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |
| Description   | The Waitakere Refuse and Recycling Station is run by the Solid Waste Business Unit of the Waitakere City Council. The residual waste from the   |                       |      |                        |      |                 |      |                |      |            |      |       |       |                     |       |       |        |

WAITAKERE CITY COUNCIL REFUSE AND RECYCLING SERVICES AND WASTE DATA

|                                     | <p>Station is transported to the Redvale landfill.</p> <p>The Station provides separate drop-off facilities for scrap metals, hard fill, hazardous goods, cardboard, and recyclables. A differential pricing system is in place to encourage users to separate loads of recyclable materials. Station staff remove considerable quantities of recyclable materials from the residual waste that is disposed of on the tipping floor. Certain types of timber are also recovered from the tipping floor, and stockpiled for the public to remove at no charge.</p>   |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
|-------------------------------------|---|------------------|---------------------|------------------------------|------|---------------------------|-------|-------------------------------------|-------|--------------------------|------|------------------------------|------|-------------|------|--------------------------|------|----------------------|------|--------|-------|--------|-------|--------|------|-----------------------|------|-------|--------|
| Annual tonnage                      | Approximately 90,000 tonnes to landfill per year.   |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| Source of waste                     | <p>The source of waste entering the Waitakere Refuse and Recycling Station is measured in annual audits undertaken by Waste Not Consulting. The source of the waste from the 2008 survey is shown in the table.</p> <table border="1"> <thead> <tr> <th>Waste source</th> <th>% of weight</th> </tr> </thead> <tbody> <tr> <td>Council kerbside collections</td> <td>28%</td> </tr> <tr> <td>Construction &amp; demolition</td> <td>20%</td> </tr> <tr> <td>Industrial/commercial/institutional</td> <td>22%</td> </tr> <tr> <td>Landscaping &amp; earthworks</td> <td>14%</td> </tr> <tr> <td>Private kerbside collections</td> <td>4%</td> </tr> <tr> <td>Residential</td> <td>12%</td> </tr> <tr> <td>General waste - Subtotal</td> <td>72%</td> </tr> <tr> <td>TOTAL</td> <td>100%</td> </tr> </tbody> </table>   | Waste source     | % of weight         | Council kerbside collections | 28%  | Construction & demolition | 20%   | Industrial/commercial/institutional | 22%   | Landscaping & earthworks | 14%  | Private kerbside collections | 4%   | Residential | 12%  | General waste - Subtotal | 72%  | TOTAL                | 100% |        |       |        |       |        |      |                       |      |       |        |
| Waste source                        | % of weight   |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| Council kerbside collections        | 28%   |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| Construction & demolition           | 20%   |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| Industrial/commercial/institutional | 22%   |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| Landscaping & earthworks            | 14%   |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| Private kerbside collections        | 4%  |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| Residential                         | 12%   |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| General waste - Subtotal            | 72%   |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| TOTAL                               | 100%  |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| Composition                         | <p>The composition of waste entering the Waitakere Refuse and Recycling Station is measured in annual audits undertaken by Waste Not Consulting. The source of the waste from the 2008 survey is shown in the table.</p> <table border="1"> <thead> <tr> <th>Primary category</th> <th>Proportion of total</th> </tr> </thead> <tbody> <tr> <td>Paper</td> <td>8.6%</td> </tr> <tr> <td>Plastics</td> <td>10.5%</td> </tr> <tr> <td>Putrescibles</td> <td>32.6%</td> </tr> <tr> <td>Ferrous metals</td> <td>2.7%</td> </tr> <tr> <td>Non-ferrous metals</td> <td>0.9%</td> </tr> <tr> <td>Glass</td> <td>2.9%</td> </tr> <tr> <td>Textiles</td> <td>5.5%</td> </tr> <tr> <td>Nappies and sanitary</td> <td>5.8%</td> </tr> <tr> <td>Rubble</td> <td>11.7%</td> </tr> <tr> <td>Timber</td> <td>15.9%</td> </tr> <tr> <td>Rubber</td> <td>0.6%</td> </tr> <tr> <td>Potentially hazardous</td> <td>2.3%</td> </tr> <tr> <td>TOTAL</td> <td>100.0%</td> </tr> </tbody> </table> | Primary category | Proportion of total | Paper                        | 8.6% | Plastics                  | 10.5% | Putrescibles                        | 32.6% | Ferrous metals           | 2.7% | Non-ferrous metals           | 0.9% | Glass       | 2.9% | Textiles                 | 5.5% | Nappies and sanitary | 5.8% | Rubble | 11.7% | Timber | 15.9% | Rubber | 0.6% | Potentially hazardous | 2.3% | TOTAL | 100.0% |
| Primary category                    | Proportion of total   |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| Paper                               | 8.6%  |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| Plastics                            | 10.5%   |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| Putrescibles                        | 32.6%   |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| Ferrous metals                      | 2.7%  |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| Non-ferrous metals                  | 0.9%  |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| Glass                               | 2.9%  |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| Textiles                            | 5.5%  |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| Nappies and sanitary                | 5.8%  |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| Rubble                              | 11.7%   |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| Timber                              | 15.9%   |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| Rubber                              | 0.6%  |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| Potentially hazardous               | 2.3%  |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |
| TOTAL                               | 100.0%  |                  |                     |                              |      |                           |       |                                     |       |                          |      |                              |      |             |      |                          |      |                      |      |        |       |        |       |        |      |                       |      |       |        |

WAITAKERE CITY DATA FROM LICENSED COLLECTORS

WAITAKERE CITY COUNCIL REFUSE AND RECYCLING SERVICES AND WASTE DATA

Under Waitakere City's Waste Bylaw 2005 all waste collectors must be licensed by Council and report regularly to Council on the quantity and type of waste collected. The following data for Waitakere City have been annualised from data for an 11-month period, July 08-May 09. The data include refuse collected by both WCC contractors and private contractors

| Waste type          | Tonnes per annum | Waste type            | Tonnes per annum |
|---------------------|------------------|-----------------------|------------------|
| 01 Household        | 25390            | 08b Hospitality       | 1550             |
| 02 Recyclables      | 25028            | 08c Manufacturing     | 9506             |
| 03 Green Waste      | 7912             | 08d Retail            | 763              |
| 04 Paper waste      | 7076             | 08e Admin / Education | 3036             |
| 05 Inorganic        | 483              | 08f Agricultural      | 80               |
| 07 Hazardous        | 147              | 08g Litter waste      | 98               |
| 08 Commercial total | 79832            | 08h Household         | 872              |
| 08a Building        | 8810             | Total                 | 170582           |

# Appendix C: Analysis of data quality

## Key



Good quality information in the public domain



Good quality information but not in the public domain



Limited information in the public domain



Poor quality information or no information

## Household

| Stream      | Outputs                           | Data type             | Data quality | Data Notes   |
|-------------|-----------------------------------|-----------------------|--------------|--|
| Refuse      | Refuse to self -haul              |                       |              |  |
|             | Refuse to Council Collector       | Participation surveys |              | Participation surveys are only conducted on an ad-hoc basis by TAs   |
|             | Refuse to Private collector       | Participation surveys |              | Council participation surveys will usually collect data on private wheelie bin/bag use<br>Auckland City has information on any properties that opt out of the refuse charge. |
| Recyclables | Recyclables to self -haul         |                       |              |  |
|             | Recyclables to Council Collector  | Participation surveys |              | Participation surveys are only conducted on an ad-hoc basis by TAs   |
|             | Recyclables to Private collector  | Operational databases |              | Information held by private collectors<br>Auckland City holds info on any properties that opt out of the refuse charge.  |
| Organic     | Garden waste to private collector | Operational databases |              | Greenfingers are happy to provide regional data and estimate they hold about 45% market share.   |

|           |                                 |                                 |   |  |
|-----------|---------------------------------|---------------------------------|---|--|
|           | Garden waste to home composting | Household surveys               |    | Home composting surveys only done very occasionally by councils  |
|           | Garden waste to Self haul       |                                 |    | Living Earth provide tonnages received and have a rough breakdown of source.                           |
|           | Food waste to home composting   | Household surveys               |    |  |
|           | Food waste to sewerage          | Studies on waste disposer usage |    |  |
| Inorganic | Inorganic to Council Collection | Participation surveys           |    | In Council collection section  |
|           | Inorganic to self haul          |                                 |    |  |
|           | Inorganic to private collector  | Operational databases           |    |  |
| Hazardous | Hazardous self haul             | Participant surveys             |    | ARC have done surveys with customers early on with the Hazmobile. Unsure if these have been published. |
|           | Hazardous to private            | Customer databases              |    |  |
| C&D       | C&D to self haul                |                                 |   |  |
|           | C&D to private collector        | Customer databases              |  |  |

**Commercial**

| Stream      | Outputs                            | Data type                  | Data quality  | Notes  |
|-------------|------------------------------------|----------------------------|---|--|
| Refuse      | Refuse to self -haul               |                            |    |  |
|             | Refuse to Council Collector        | Number of business pickups |    | Most council collections do not differentiate household and business sources |
|             | Refuse to Private collector        | Operational databases      |    |  |
| Recyclables | Recyclables to self -haul          |                            |    |  |
|             | Recyclables to Council Collector   | Number of business pickups |    | Most council collections do not differentiate household and business sources |
|             | Recyclables to Private collector   | Operational databases      |    |  |
| Organic     | Garden waste to private collector  | Operational databases      |   |  |
|             | Garden waste to On-site composting |                            |  |  |
|             | Garden waste to self haul          |                            |  |  |
|             | Food waste to private collector    | Operational databases      |  |  |
|             | Food waste to sewerage             |                            |  |  |

|           |                                |                       |   |  |
|-----------|--------------------------------|-----------------------|---|--|
|           | Food waste to self haul        |                       |  |  |
| Inorganic | Inorganic to self haul         |                       |  |  |
|           | Inorganic to private collector | Operational databases |  |  |
| Hazardous | Hazardous self haul            |                       |  |  |
|           | Hazardous to private collector | Operational databases |  |  |
| C&D       | C&D to self haul               |                       |  |  |
|           | C&D to private collector       | Operational databases |  |  |

**Council Collected**

| Inputs          | Data type                      | Data quality  | Outputs             | Data type       | Data quality  | Notes   |
|-----------------|--------------------------------|---|---------------------|-----------------|---|---|
| Kerbside Refuse | # HH collected from & location |  | To transfer station | Tonnage by load |  | Councils control Waitakere, Waiheke, Waiuku and Helensville Transfer Stations. Information on weighbridge tonnages is provided as part of collection contracts<br>Rodney DC can access collection data via licensing provisions |
|                 | Collection configuration       |  |                     |                 |   |   |
|                 |                                |   | To landfill         | Tonnage by load |  | Auckland has info from Claris & MCC from Whitford information on weighbridge tonnages is provided as part of collection contracts<br>Rodney DC can access collection data via licensing provisions                              |

| Inputs             | Data type                      | Data quality  | Outputs             | Data type       | Data quality  | Notes   |
|--------------------|--------------------------------|---|---------------------|-----------------|---|---|
| Kerbside Recycling | # HH collected from & location |    | To transfer station | Tonnage by load |    | Only ACC kerbside collected material delivered to transfer station is on Waiheke and Gt Barrier   |
|                    | Collection configuration       |  | To MRF              | Tonnage by load |  | ACC & MCC to Visy MRF<br>NSCC & WCC to Onyx MRF<br>RDC & PDC to Smart Environmental<br>Franklin to Transpacific Allbrite Facility in Takanini |
|                    |                                |   |                     | Composition     |  | Visy MRF composition is available through ACC and assume MCC as well.<br>Smart Environmental will provide their MRF composition               |
|                    |                                |   |                     | To Recycler     | Tonnage by load   | ?   |

| Inputs | Data type | Data | Outputs | Data type | Data | Notes |
|--------|-----------|------|---------|-----------|------|-------|
|--------|-----------|------|---------|-----------|------|-------|

|                       |                                | quality   |                     |                 | quality   |   |
|-----------------------|--------------------------------|---|---------------------|-----------------|---|---|
| Inorganic collections | # HH collected from & location |  | To transfer station | Tonnage by load |  | Weighbridge data provided as part of collection contracts<br>No collections for RDC<br>FDC provides periodic drop off site for inorganic  |
|                       | Collection configuration       |  | To landfill         | Tonnage by load |  | Auckland has info from Claris & MCC from Whitford<br>Weighbridge data provided as part of collection contracts<br>No collections for RDC<br>FDC provides periodic drop off site for inorganic |
|                       |                                |   | To Recycler         | Tonnage by load |  | Information on recycling tonnages collected provided as part of collection contract<br>Some composition info available from surveys?  |

| Inputs                   | Data type            | Data quality  | Outputs             | Data type       | Data quality  | Data availability  |
|--------------------------|----------------------|---|---------------------|-----------------|---|--|
| Litter & Illegal Dumping | Areas collected from |  | To transfer station | Tonnage by load |  | Information provided by contractors? Yes in Auckland City although some problems with mixed loads (eg inner CBD) |

| Inputs                 | Data type            | Data quality  | Outputs             | Data type       | Data quality  | Data availability  |
|------------------------|----------------------|---|---------------------|-----------------|---|--|
| Public place recycling | Areas collected from |  | To transfer station | Tonnage by load |  | All TAs funded to participate in scheme but limited data at this point in time |
| Drop off facilities    | Areas collected from |  | To MRF              | Tonnage by load |  | All TAs funded to participate in scheme but limited data at this point in time |
|                        |                      |   | To Recycler         | Tonnage by load | ?   | ?  |

### Self Haul

| Inputs            | Data type | Data quality  | Outputs                            | Data type                | Data quality  | Notes   |
|-------------------|-----------|---|------------------------------------|--------------------------|---|---|
| Household Refuse  |           |  | To transfer station                | Tonnage by load          |  | Tonnage only at council controlled facilities       |
| Commercial Refuse |           |  | To illegal disposal                | Illegal disposal data    |  | Data only available where dumping has been reported |
|                   |           |   | To litter bin or drop off facility | Litter/drop off tonnages |  |   |

| Inputs    | Data type | Data quality  | Outputs  | Data type                  | Data quality   | Notes   |
|-----------|-----------|---|--|----------------------------|--|---|
| Recycling |           |  | To transfer station                            | Tonnage by load            |   | Tonnage only at council controlled facilities |
|           |           |   | To drop off facility or public place recycling | Tonnage by site & material |   |   |
|           |           |   | To Recycler                                    |                            |  |   |

| Inputs  | Data type | Data quality  | Outputs                         | Data type        | Data quality  | Notes   |
|---------|-----------|---|---------------------------------|------------------|---|---|
| Organic |           |  | Green waste to transfer station | Tonnage by load  |  | Living Earth will provide a yearly tonnage figure |
|         |           |   | Green waste to reprocessor      | Tonnage by load  |  |   |
|         |           |   | Green waste to home/onsite      | Surveys/ Studies |  |   |

|  |  |  |                                      |                  |   |  |
|--|--|--|--------------------------------------|------------------|---|--|
|  |  |  | composting                           |                  |   |  |
|  |  |  | Food waste to reprocessor            | Tonnage by load  |  |  |
|  |  |  | Food waste to sewerage               | Surveys/ Studies |  |  |
|  |  |  | Food waste to home/onsite composting | Surveys/ Studies |  |  |

| Inputs    | Data type | Data quality  | Outputs             | Data type       | Data quality  | Notes   |
|-----------|-----------|---|---------------------|-----------------|---|---|
| Inorganic |           |  | To transfer station | Tonnage by load |  | Tonnage only at council controlled facilities |

| Inputs    | Data type | Data quality   | Outputs             | Data type  | Data quality  | Notes   |
|-----------|-----------|--|---------------------|--|---|---|
| Hazardous |           |  | To hazmobile        | Overall tonnes collected<br>Composition and amount by location |   | ARC holds detailed information                |
|           |           |  | To transfer station | Tonnage by load  |  | Tonnage only at council controlled facilities |

| Inputs | Data type | Data quality  | Outputs             | Data type       | Data quality  | Notes   |
|--------|-----------|---|---------------------|-----------------|---|---|
| C&D    |           |  | To transfer station | Tonnage by load |  | Tonnage only at council controlled facilities |

|   |   |   |   |                       |                 |   |  |
|---|---|---|---|-----------------------|-----------------|---|--|
| <div style="background-color: #4a7ebb; width: 100%; height: 100%;"></div> | <div style="background-color: #7baed6; width: 100%; height: 100%;"></div> | <div style="background-color: #a6c9ec; width: 100%; height: 100%;"></div> | <div style="background-color: #556b2f; width: 100%; height: 100%;"></div> | To landfill disposal  | Tonnage by load |  |  |
|   |   |   |   | To managed fill       | Tonnage by load |  |  |
|   |   |   |   | To cleanfill disposal |                 |  |  |

### Private Collections

| Inputs | Data type                     | Data quality  | Notes   | Outputs             | Data type             | Data quality  | Notes  |
|--------|-------------------------------|---|---|---------------------|-----------------------|---|--|
| Refuse | Household or business address |  | Auckland City has records of properties opting out of their service | To transfer station | Tonnage by load       |  | Northern Alliance has good data on private collections through their licensing scheme but other TAs have limited information |
|        | # of pickups                  |  | As above  | To landfill         | Tonnage by load       |  | Northern Alliance has good data on private collections through their licensing scheme but other TAs have limited information |
|        |                               |   |   | To illegal disposal | Illegal disposal data |  |  |

| Inputs    | Data type                     | Data quality  | Notes    | Outputs             | Data type       | Data quality  | Notes  |
|-----------|-------------------------------|---|----------|---------------------|-----------------|---|--|
| Recycling | Household or business address |   | As above | To transfer station | Tonnage by load |   | Northern Alliance has good data on private collections through their licensing scheme but other TAs have limited information |
|           | # of pickups                  |  |          | To Recycler         |                 |  | Northern Alliance has good data on private collections through their licensing scheme but other TAs have limited information |

| Inputs  | Data type                     | Data quality  | Outputs                         | Data type       | Data quality  | Notes  |
|---------|-------------------------------|---|---------------------------------|-----------------|---|--|
| Organic | Household or business address |  | Green waste to transfer station | Tonnage by load |  | Northern Alliance has good data on private collections through their licensing scheme but other TAs have limited information |
|         | # of pickups                  |  | Green waste to reprocessor      | Tonnage by load |  | Northern Alliance has good data on private collections through their licensing scheme but other TAs have limited information |
|         |                               |   | Food waste to reprocessor       | Tonnage by load |  |  |

| Inputs    | Data type                     | Data quality   | Outputs             | Data type                | Data quality  | Notes  |
|-----------|-------------------------------|--|---------------------|--------------------------|---|--|
| Hazardous | Household or business address |  | To reprocessors     | Overall tonnes collected |   | Northern Alliance has good data on private collections through their licensing scheme but other TAs have limited information |
|           |                               |  | To transfer station | Tonnage by load          |  | Northern Alliance has good data on private collections through their licensing scheme. Other TAs have limited information    |

| Inputs | Data type                     | Data quality  | Outputs             | Data type       | Data quality  | Notes   |
|--------|-------------------------------|---|---------------------|-----------------|---|---|
| C&D    | Household or business address |  | To transfer station | Tonnage by load |  | Northern Alliance has good data on private collections through their licensing scheme. Other TAs have limited information |

|  |  |  |              |                 |   |   |
|--|--|--|--------------|-----------------|---|---|
|  |  |  | To landfill  | Tonnage by load |  | Northern Alliance has good data on private collections through their licensing scheme. Other TAs have limited information |
|  |  |  | Managed fill |                 |  | Northern Alliance has good data on private collections through their licensing scheme. Other TAs have limited information |
|  |  |  | Clean fill   |                 |  | Transport operators do not have to be licensed  |

#### Transfer Station: Privately Owned

| Inputs                   | Data type                     | Data quality  | Outputs             | Data type       | Data quality  |
|--------------------------|-------------------------------|---|---------------------|-----------------|---|
| Council collected Refuse | # Vehicles<br>Tonnage by load |    | To landfill         | Tonnage by load |  |
| Council collected litter | # Vehicles<br>Tonnage by load |    | To transfer station | Tonnage by load |  |
| Self Haul refuse         | # Vehicles<br>Tonnage by load |  |                     |                 |   |
| Private Refuse           | # Vehicles<br>Tonnage by load |  |                     |                 |   |

| Inputs            | Data type                            | Data quality  | Outputs       | Data type                  | Data quality  |
|-------------------|--------------------------------------|---|---------------|----------------------------|---|
| Private recycling | Operator<br># Vehicles<br>Tonnage by |  | To processors | Tonnage by load & material |  |

|                     |                               |   |        |                            |   |
|---------------------|-------------------------------|---|--------|----------------------------|---|
|                     | load                          |   |        |                            |   |
| Self haul recycling | # Vehicles<br>Tonnage by load | ★ | To MRF | Tonnage by load & material | ★ |

| Inputs            | Data type                                 | Data quality | Notes   | Outputs                  | Data type       | Data quality |
|-------------------|---|--------------|---|--------------------------|-----------------|--------------|
| Self haul Organic | # Vehicles<br>Tonnage by load             | ★            | Living Earth will provide a rough split between customer groups | Green waste to processor | Tonnage by load | ★            |
| Private organic   | Operator<br># Vehicles<br>Tonnage by load | ★            | As above  |                          |                 |              |

| Inputs                      | Data type                     | Data quality | Outputs     | Data type       | Data quality |
|-----------------------------|-------------------------------|--------------|-------------|-----------------|--------------|
| Council collected inorganic | # Vehicles<br>Tonnage by load | ★            | To landfill | Tonnage by load | ★            |
| Self haul Inorganic         | # Vehicles<br>Tonnage by load | ★            | To reuse    | Tonnage by load | ★            |

| Inputs              | Data type                     | Data quality | Outputs       | Data type       | Data quality |
|---------------------|-------------------------------|--------------|---------------|-----------------|--------------|
| Self haul Hazardous | # Vehicles<br>Tonnage by load | ★            | To processors | Tonnage by load | ★            |
| Private Hazardous   | # Vehicles<br>Tonnage by      | ★            | To disposal   | Tonnage by load | ★            |

|  |      |  |  |  |  |
|--|------|--|--|--|--|
|  | load |  |  |  |  |
|--|------|--|--|--|--|

| Inputs        | Data type                     | Data quality | Outputs         | Data type       | Data quality |
|---------------|-------------------------------|--------------|-----------------|-----------------|--------------|
| Self haul C&D | # Vehicles<br>Tonnage by load | ★            | To processors   | Tonnage by load | ★            |
| Private C&D   | # Vehicles<br>Tonnage by load | ★            | To cleanfill    | Tonnage by load | ★            |
|               |                               |              | To landfill     | Tonnage by load | ★            |
|               |                               |              | To managed fill | Tonnage by load | ★            |

**Transfer Stations: Council Owned**

| Inputs                   | Data type                            | Data quality | Outputs             | Data type       | Data quality |
|--------------------------|--------------------------------------|--------------|---------------------|-----------------|--------------|
| Council collected Refuse | # Vehicles<br>Tonnage by load        | ★            | To landfill         | Tonnage by load | ★            |
| Council collected litter | # Vehicles<br>Tonnage by load        | ★            | To transfer station | Tonnage by load | ★            |
| Self Haul refuse         | # Vehicles<br>Tonnage by load        | ★            |                     |                 |              |
| Private Refuse           | Operator<br># Vehicles<br>Tonnage by | ★            |                     |                 |              |

|  |      |  |  |  |  |
|--|------|--|--|--|--|
|  | load |  |  |  |  |
|--|------|--|--|--|--|

| Inputs              | Data type                                 | Data quality  | Outputs       | Data type                  | Data quality  |
|---------------------|---|---|---------------|----------------------------|---|
| Private recycling   | Operator<br># Vehicles<br>Tonnage by load |  | To processors | Tonnage by load & material |  |
| Self haul recycling | # Vehicles<br>Tonnage by load             |  | To MRF        | Tonnage by load & material |  |

| Inputs            | Data type                                 | Data quality   | Outputs                  | Data type       | Data quality  |
|-------------------|---|--|--------------------------|-----------------|---|
| Self haul Organic | # Vehicles<br>Tonnage by load             |   | Green waste to processor | Tonnage by load |  |
| Private organic   | Operator<br># Vehicles<br>Tonnage by load |  |                          |                 |   |

| Inputs                      | Data type                     | Data quality  | Outputs     | Data type       | Data quality  |
|-----------------------------|-------------------------------|---|-------------|-----------------|---|
| Council collected inorganic | # Vehicles<br>Tonnage by load |  | To landfill | Tonnage by load |  |
| Self haul Inorganic         | # Vehicles<br>Tonnage by load |  | To reuse    | Tonnage by load |  |

| Inputs                 | Data type                        | Data quality  | Outputs       | Data type          | Data quality  |
|------------------------|----------------------------------|---|---------------|--------------------|---|
| Self haul<br>Hazardous | # Vehicles<br>Tonnage by<br>load |  | To processors | Tonnage by<br>load |  |
| Private<br>Hazardous   | # Vehicles<br>Tonnage by<br>load |  | To disposal   | Tonnage by<br>load |  |

| Inputs           | Data type                        | Data quality  | Outputs         | Data type          | Data quality   |
|------------------|----------------------------------|---|-----------------|--------------------|--|
| Self haul<br>C&D | # Vehicles<br>Tonnage by<br>load |  | To Reprocessors | Tonnage by<br>load |   |
| Private<br>C&D   | # Vehicles<br>Tonnage by<br>load |  | To cleanfill    | Tonnage by<br>load |   |
|                  |                                  |   | To landfill     | Tonnage by<br>load |   |
|                  |                                  |   | To managed fill | Tonnage by<br>load |  |

#### Landfill: Privately Owned

| Inputs          | Data type                  | Data quality  | Notes                        |
|-----------------|----------------------------|---|------------------------------|
| Kerbside Refuse | # loads                    |  | Information from contractors |
|                 | Vehicle types &<br>weights |  | Information from Contractors |

|                            |                                    |   |   |
|----------------------------|------------------------------------|---|---|
| Transfer station refuse    | # loads<br>Vehicle types & weights |  | Only for council controlled facilities (Claris) |
| Hazardous & special wastes | # loads<br>Vehicle types & weights |  |   |
| Private refuse             | # loads<br>Vehicle types & weights |  |   |
| Clean fill type material   | # loads<br>Vehicle types & weights |  |   |

#### Landfill: Council Owned

| Inputs                     | Data type                          | Data quality  | Notes   |
|----------------------------|------------------------------------|---|---|
| Kerbside Refuse            | # loads                            |    | Information from Contractors                    |
|                            | Vehicle types & weights            |  | Information from Contractors                    |
| Transfer station refuse    | # loads<br>Vehicle types & weights |  | Only for council controlled facilities (Claris) |
| Hazardous & special wastes | # loads<br>Vehicle types & weights |  |   |
| Private refuse             | # loads<br>Vehicle types & weights |  |   |

|                          |                                    |   |  |
|--------------------------|------------------------------------|---|--|
| Clean fill type material | # loads<br>Vehicle types & weights |  |  |
|--------------------------|------------------------------------|---|--|

### Managed fill

| Inputs                    | Data type  | Data quality   | Notes  |
|---------------------------|--|--|--|
| Transfer station material | # loads<br>Vehicle types & weights/volume estimates<br><br>Load type estimates |   | ARC stipulates some data recording as part of the managed fill consenting process but this does not always include tonnage information |
| Private material          | # loads<br>Vehicle types & weights/volume estimates<br>Load type estimates     |   | ARC stipulates some data recording as part of the managed fill consenting process but this does not always include tonnage information |
| Self haul                 |  |  | ARC stipulates some data recording as part of the managed fill consenting process but this does not always include tonnage information |

### Clean fill

| Inputs                    | Data type  | Data quality   |
|---------------------------|--|--|
| Transfer station material | # loads<br>Vehicle types & weights/volume estimates<br>Load type estimates |  |
| Private material          | # loads<br>Vehicle types & weights/volume estimates                        |  |

|           |                     |  |
|-----------|---------------------|--|
|           | Load type estimates |  |
| Self haul |                     |  |

### Hazardous Waste Processors

| Inputs             | Data type                          | Data quality   | Notes                                       |
|--------------------|------------------------------------|--|---|
| HazMobile          | # loads<br>Quantities by material  |   | ARC holds detailed information on HazMobile |
| Transfer station   | # loads<br>Vehicle types & weights |   |   |
| Private collectors | # loads<br>Vehicle types & weights |   |   |
| Self haul          |                                    |  |   |

### MRFs

| Inputs                     | Data type                  | Data quality  | Outputs       | Data type       | Data quality  | Notes   |
|----------------------------|----------------------------|---|---------------|-----------------|---|---|
| Kerbside recycling         | # loads                    |  | To processors | Tonnage by load |  |   |
|                            | Vehicle types & weights    |  | To disposal   | Tonnage by load |  | Have a figure from Visy but not sure on accuracy. |
| Transfer station recycling | # loads<br>Vehicle types & |  |               |                 |   |   |

|                               |                                    |   |  |  |  |  |
|-------------------------------|------------------------------------|---|--|--|--|--|
|                               | weights                            |   |  |  |  |  |
| Private recycling collections | # loads<br>Vehicle types & weights | ★ |  |  |  |  |

**Recyclables Reprocessors**

| Inputs                        | Data type               | Data quality | Outputs     | Data type       | Data quality |
|-------------------------------|-------------------------|--------------|-------------|-----------------|--------------|
| Kerbside recycling            | # loads                 | ★            | To markets  | Tonnage by load | ★            |
|                               | Vehicle types & weights | ★            |             |                 |              |
| Transfer station recycling    | # loads                 | ★            | To disposal | Tonnage by load | ★            |
|                               | Vehicle types & weights | ★            |             |                 |              |
| Private recycling collections | # loads                 | ★            |             |                 |              |
|                               | Vehicle types & weights | ★            |             |                 |              |
| MRF sorted material           | # loads                 | ★            |             |                 |              |
|                               | Vehicle types & weights | ★            |             |                 |              |

|                     |                         |   |  |  |  |
|---------------------|-------------------------|---|--|--|--|
| Self haul recycling | # loads                 | ★ |  |  |  |
|                     | Vehicle types & weights | ★ |  |  |  |

**Organic Waste Reprocessors**

| Inputs  | Data type               | Data quality | Outputs     | Data type       | Data quality |
|---|-------------------------|--------------|-------------|-----------------|--------------|
| Transfer station material                         | # loads                 | ★            | To markets  | Tonnage by load | ★            |
|   | Vehicle types & weights | ★            |             |                 |              |
| Private green waste collections                   | # loads                 | ★            | To disposal | Tonnage by load | ★            |
|   | Vehicle types & weights | ★            |             |                 |              |
| Private food/organic processing waste collections | # loads                 | ★            |             |                 |              |
|   | Vehicle types & weights | ★            |             |                 |              |
| Self haul green waste                             | # loads                 | ★            |             |                 |              |

|  |                         |   |  |  |  |
|--|-------------------------|---|--|--|--|
|  | Vehicle types & weights |  |  |  |  |
|--|-------------------------|---|--|--|--|

**Sewerage System**

| Inputs                                       | Data type | Data quality  | Notes                                   |
|--|-----------|---|---|
| In sink disposal systems                     |           |  | Some information available from studies |
| Liquid & macerated organic processing wastes |           |  |   |