



Waimakariri District Council Waste Assessment

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Acknowledgements

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1 Introduction

This Waste Assessment has been prepared for Waimakariri District Council (Council) by Eunomia Research & Consulting in accordance with the requirements of the Waste Minimisation Act 2008 (WMA). This document provides background information and data to support the Council's waste management and minimisation planning process.

1.1 Structure of this Document

This document is arranged into a number of sections designed to help construct a picture of waste management in the Waimakariri district. The key sections are outlined below.

Introduction

The introduction covers a number of topics that set the scene. This includes clarifying the purpose of this Waste Assessment, its scope, the legislative context, and key documents that have informed the assessment.

Canterbury Region

This section presents a brief overview of key aspects of the region's geography, economy, and demographics that influence the quantities and types of waste generated and potential opportunities. It also provides an overview of regional waste facilities, and initiatives that may be of relevance to how we manage our waste.

Our District

This section presents a brief overview of key aspects of the district's geography, economy, and demographics that influence the quantities and types of waste generated and potential opportunities.

Waste Infrastructure, Services, Data and Performance Measurement

These sections examine how waste is currently managed, where waste comes from, how much there is, its composition, and where it goes.

Gap Analysis and Future Demand

This section provides an analysis of what is likely to influence demand for waste and recovery services in the district and region and identifies key gaps in current and future service provision, and in the Council's ability to promote effective and efficient waste management and minimisation.

Statement of Options & Council's Proposed Role

These sections develop options available for meeting the forecast future demand and identify the Council's proposed role in ensuring that future demand is met, and that Council is able to meet its statutory obligations.

Statement of Proposals

The statement of proposals sets out what options are available to meet the projected demand or address the key issues. The proposals will be assessed against the strategic direction for Council, and preferred options will be carried forward into the Waste Management and Minimisation Plan (WMMP).

Appendices

The appendices include the consultation response from the Medical Officer of Health as well as additional detail on the national context.

1.2 Purpose of this Waste Assessment

This Waste Assessment is intended to provide an initial step towards the development of a WMMP and sets out the information necessary to identify the key issues and priority actions that will be included in the draft WMMP.

Section 51 of the WMA outlines the requirements of a waste assessment, which must include:

- a description of the collection, recycling, recovery, treatment, and disposal services provided within the territorial authority's district;
- a forecast of future demands;
- a statement of options;
- a statement of the territorial authority's intended role in meeting demands;
- a statement of the territorial authority's proposals for meeting the forecast demands; and
- a statement about the extent to which the proposals will protect public health, and promote effective and efficient waste management and minimisation.

1.3 Legislative Context

The principal solid waste legislation in New Zealand is the Waste Minimisation Act 2008 (WMA). The stated purpose of the WMA is to:

- “encourage waste minimisation and a decrease in waste disposal in order to
- (a) protect the environment from harm; and
 - (b) provide environmental, social, economic, and cultural benefits.”

To further its aims, the WMA requires territorial authorities (TAs) to promote effective and efficient waste management and minimisation within their district. To achieve this, the WMA requires that all TAs adopt a WMMP.

The WMA requires every TA to complete a formal review of its existing waste management and minimisation plan at least every six years. The review must be consistent with WMA sections 50 and 51.

Section 50 of the WMA also requires all TAs to prepare a ‘waste assessment’ prior to reviewing its existing plan. This document has been prepared in fulfilment of that requirement. The Council’s existing Waste Assessment was produced in 2015, and the resulting WMMP was adopted in July 2016.

Further detail on key waste-related legislation is contained in Appendix A.4.0.

1.4 Scope

1.4.1 General

As well as fulfilling the statutory requirements of the WMA, this Waste Assessment will build a foundation that will enable Council to review and/or update its WMMP in an informed and effective manner, as required. In preparing this document, reference has been made to the Ministry for the Environment’s ‘Waste Management and Minimisation Planning: Guidance for Territorial Authorities’¹, while noting that this guidance dates back to 2015 and has, to an extent, been superseded through practice.

A key aspect of this Waste Assessment will be forming a clear picture of waste flows and management options in the district. The WMA requires that a waste assessment must contain:

“A description of the collection, recycling, recovery, treatment, and disposal services provided within the territorial authority’s district (whether by the territorial authority or otherwise)”.

This means that this Waste Assessment must take into consideration all waste and recycling services carried out by private waste operators as well as Council’s own services. While the Council has reliable data on the waste flows that it controls, data on those services provided by private industry is limited. Reliable, regular data on waste flows is important if the TA chooses to include waste reduction targets in their WMMP. Without data, targets cannot be readily measured.

The New Zealand Waste Strategy 2023 also repeatedly refers to central and local councils as being the key agencies by which many goals could be achieved.

1.4.2 Period of Waste Assessment

The WMA requires WMMPs to be reviewed at least every six years, but it is considered prudent to take a longer-term view. The horizon for the WMMP is not fixed but is assumed to be centred on a 10-year timeframe, in line with council long term plans (LTPs). For some assets and services, it is necessary to consider a longer timeframe and this is taken into account where appropriate. Therefore, the period of the Waste Assessment looks forward over at least the next ten years, and sometimes longer (in the case of facilities, e.g. landfill consenting).

1.4.3 Consideration of Solid, Liquid and Gaseous Wastes

The guidance provided by the Ministry for the Environment on preparing Waste Management and Minimisation Plans states that:

“Councils need to determine the scope of their WMMP in terms of which wastes and diverted materials are to be considered within the plan”.

¹ Ministry for the Environment (2015), Waste Management and Minimisation Planning: Guidance for Territorial Authorities

The guidance further suggests that liquid or gaseous wastes that are directly managed by a TA, or are disposed of to landfill, should be seriously considered for inclusion in a WMMP.

Other wastes that could potentially be within the scope of the WMMP include gas from landfills and the management of biosolids from wastewater treatment plant (WWTP) processes.

The nearest landfill to Waimakariri district is Transwaste Canterbury's Kate Valley landfill, which has a landfill gas capture system in place.

In line with the Council's previous WMMP, this Waste Assessment is focused on solid waste that is disposed of to land or diverted from land disposal, including solid waste collected and disposed of by commercial enterprise as well as waste collected by the council.

However, given the current work on restructuring water services (including waste water), this WA and any resulting WMMPs will not include management of solid wastes resulting from these activities.

1.4.4 Public Health Issues

Protecting public health is one of the original reasons for local authority involvement in waste management. Te rautaki para, the new Waste Strategy, refers to protection of human health as one of the outcomes from successful recovery of resources.

Protection of public health is currently addressed by a number of pieces of legislation. Discussion of the implications of the legislation is contained in Appendix A.4.0.

1.4.4.1 Key Waste Management Public Health Issues

Key issues that are likely to be of concern in terms of public health include the following:

- Population health profile and characteristics
- Meeting the requirements of the Health Act 1956
- Management of putrescible wastes
- Management of nappy and sanitary wastes
- Potential for dog/seagull/vermin strike
- Timely collection of material
- Locations of waste activities
- Management of spillage
- Litter and illegal dumping
- Medical waste from households and healthcare operators
- Storage of wastes
- Management of biosolids/sludges from WWTP
- Management of hazardous wastes (including asbestos, e-waste, etc.)
- Private on-site management of wastes (i.e. burning, burying)
- Closed landfill management including air and water discharges, odours and vermin
- Health and safety considerations relating to collection and handling.

1.4.4.2 Management of Public Health Issues

From a strategic perspective, the public health issues listed above are likely to apply to a greater or lesser extent to virtually all options under consideration. For example, illegal

dumping tends to take place ubiquitously, irrespective of whatever waste collection and transfer station systems are in place.

Some systems may possibly exacerbate the problem (infrequent collection, user-charges, inconveniently located facilities etc.) but, by the same token, the issues can be managed through methods such as enforcement, education and by providing convenient facilities. It is also known that illegal dumping continues to be a problem even in areas where disposal is free of charge.

In most cases, public health issues will be able to be addressed through setting appropriate performance standards for waste services. It is also important to ensure performance is monitored and reported on and that there are appropriate structures within the contracts for addressing issues that arise.

There has been an observed added emphasis on workplace health and safety under the Health and Safety at Work Act 2015. This legislation can impact on, for example, the choice of collection methodologies and working practices and the design of waste facilities.

In addition, public health impacts will be able to be managed through consideration of potential effects of planning decisions, especially for vulnerable groups. That is, potential issues will be identified prior to implementation so they can be mitigated for.

1.5 Strategic Context

1.5.1 New Zealand Waste Strategy

The 2023 New Zealand Waste Strategy is the first time New Zealand's national strategic direction for waste has been reviewed since 2002, and unsurprisingly takes quite a different approach to the previous Strategy.

The vision of the 2023 New Zealand Waste Strategy, Te rautaki para, is:

“By 2050, Aotearoa New Zealand is a low-emissions, low-waste society, built upon a circular economy.

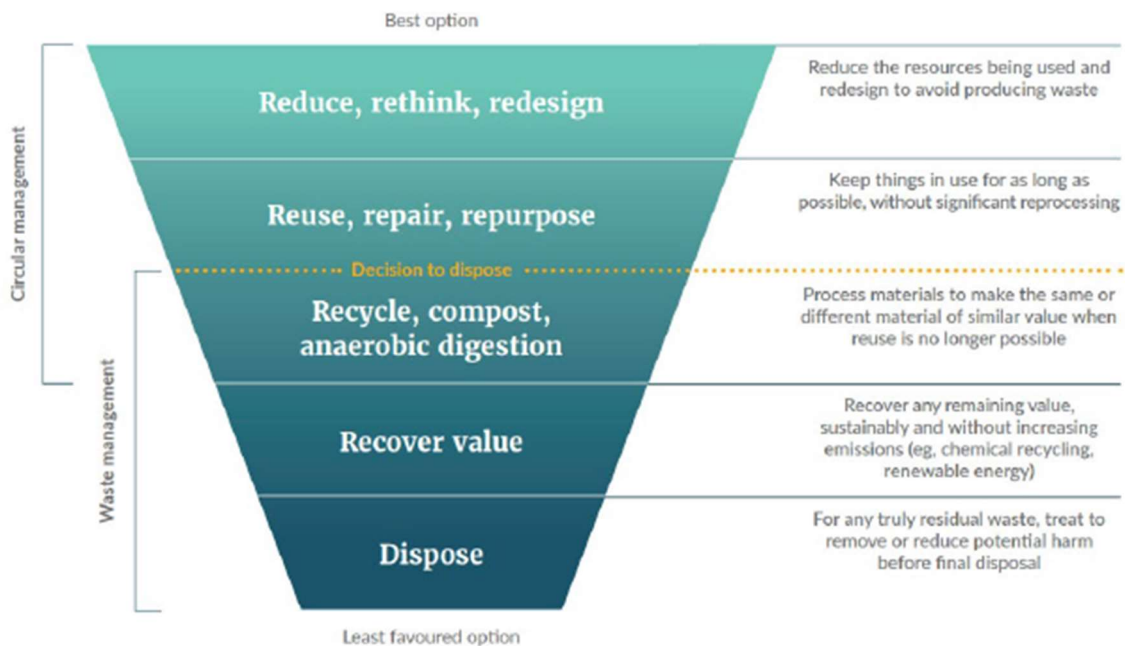
We cherish our inseparable connection with the natural environment and look after the planet's finite resources with care and responsibility”

This vision is supported by six guiding principles:

- 1) Take responsibility for how we make, use, manage and dispose of things
- 2) Apply the waste hierarchy preferences to how we manage materials
- 3) Protect and regenerate the natural environment and its systems
- 4) Deliver equitable and inclusive outcomes
- 5) Ensure our systems for using, managing and disposing of materials are financially sustainable
- 6) Think across systems, places and generations

A revised waste hierarchy is set out (shown below), intended to illustrate which options are the best, and which are least favoured. While many versions of the waste hierarchy exist, the one in the strategy is intended to be simple and easy to understand.

Figure 1: Revised Waste Hierarchy



The strategy has three phases:

- 1) Embedding circular thinking into systems (by 2030)
- 2) Expanding to make circular normal (to 2040)
- 3) Helping others do the same (by 2050)

Each of the three phases has associated goals, some of which are particularly relevant to a Waste Assessment and WMMP process; others more relevant to central government, the wider public, the community/private sector, or other local government roles such as contaminated land management.

The key role for local government is described in the Strategy as:

- getting involved in implementing the strategy and the process of developing the action and investment plan – using the strategy as a starting point for WMMPs;
- looking for opportunities to work with other councils, particularly on facilities and services that support a ‘national circular resource management network’;
- supporting local community groups and non-governmental organisations with waste reduction initiatives;
- incorporating national behaviour change programmes in local activity;
- ensuring planning and consenting processes consider the need for waste management infrastructure and services; and
- planning and resourcing contaminated land management including vulnerable landfills.

The Strategy has three targets to be achieved by 2030:

- 1) Reduce waste generation by 10% per person
- 2) Reduce waste disposal by 30% per person
- 3) Reduce biogenic methane emissions from waste by at least 30%

However, at this point no baseline has been set.

Further detail on the implications of the Waste Strategy is set out in Appendix A.4.1.

Section 44 of the WMA requires councils to have regard to the NZWS when preparing their WMMP. For the purpose of this Waste Assessment, we have given regard to the NZWS and Council's current WMMP.

These sections are discussed in more detail in Appendix A.4.0.

1.5.2 Emissions Reduction Plan

The Climate Change Commission (CCC) was established to provide impartial expert evidence to government to support initiatives that would reduce greenhouse gas emissions and address climate change mitigation and adaptation, contributing towards the goals set out in the Climate Change Response Act 2002.

The CCC reviewed the waste sector as part of its work during 2020 and 2021 and has provided its final advice to government with respect to this sector, amongst others, in the Emissions Reduction Plan (May 2022)².

The advice of the CCC is that unless waste management practices and policy settings in New Zealand change significantly, we will not meet the targets set in the 2002 Act – *“current policies will not deliver the emissions reductions we must achieve.”* Comprehensive action is required to reduce waste overall, divert waste from landfill disposal, and improve/extend landfill gas capture systems.

The main source of biogenic methane emissions from the waste sector is the anaerobic decomposition of organic wastes in landfill (94% in 2019).

The key actions for the waste sector are:

- enable households and businesses to reduce organic waste (reduction of food scraps at home and in businesses, and participation in improved kerbside collections);
- divert more organic waste from landfill (improve household kerbside collections of food and garden waste, invest in processing and recovery infrastructure for organics, require organic waste to be separated);
- reduce and divert construction and demolition waste (minimisation, sorting and processing infrastructure, separation of material);
- bans or limits for organic waste to landfill – potentially by 2030;
- increase gas capture from Class 1 landfills (regulations requiring gas capture, investigate additional gas capture); and
- improve waste data including a national operator licensing scheme (which will improve information on greenhouse gas emissions).

The Plan includes a ‘waste pathway to 2035’ which is highly consistent with the New Zealand Waste Strategy. Key actions over the next ten years include:

- 2023: organic waste prevention programmes and increased investment in resource recovery

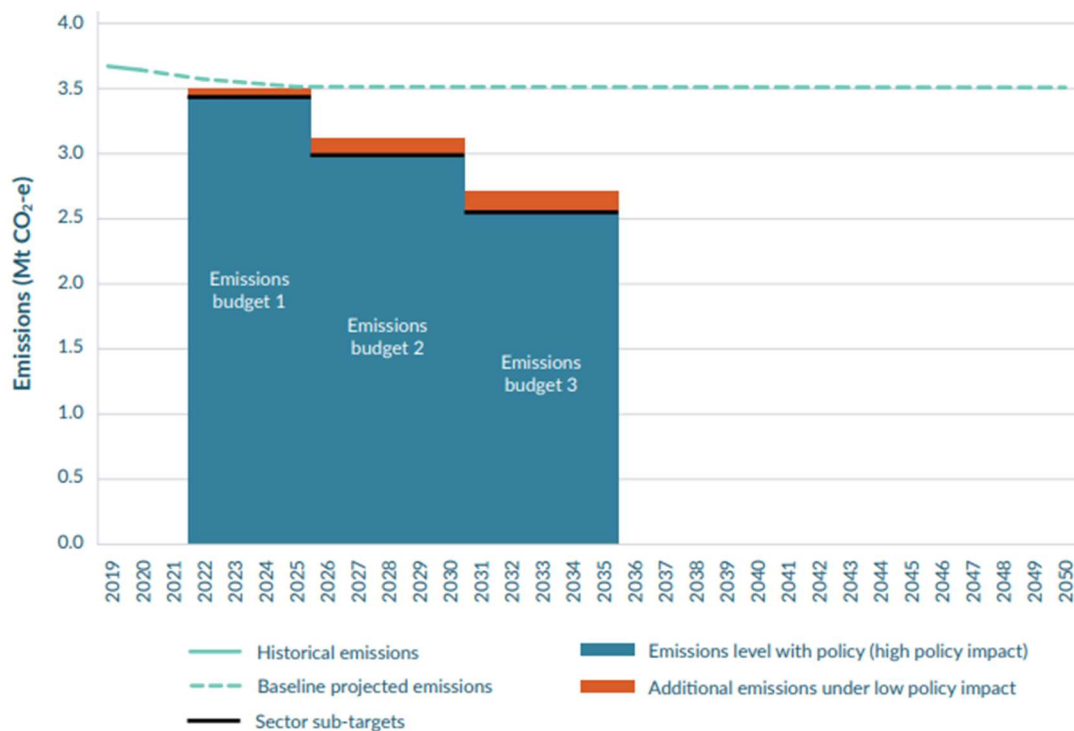
² <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>

- 2024: new waste legislation, national waste reporting, wider coverage of kerbside organics collections, more organics recovery/processing
- 2025: new regulations to drive emissions reduction, national waste licensing, all Class 1 landfills capturing gas
- To 2030: possibly organic waste landfill limits or bans
- To 2035: target of 40% reduction in biogenic methane (from 2017 levels)

New Zealand has a long-term target of net zero greenhouse gases by 2050, and a specific target for biogenic methane of 24 – 47% reduction by 2050 under the Climate Change Response Act (2002 Act).

It is worth noting that even with all of the initiatives proposed this would still fall short of achieving the first sub-target for the waste sector (2022 – 2025) but will come very close to the target in the period 2026 – 2035, as shown in the chart below:

Figure 2: Total projected methane emissions from waste showing the impact of proposed combined waste policy options



Source: Ministry for the Environment. 2022. *Te hau mārohi ki anamata | Towards a productive, sustainable, and inclusive economy*. Wellington: Ministry for the Environment. This assumes 40% of food waste diverted to composting and 60% to anaerobic digestion and 100% of green waste to composting.

1.5.3 Waste Minimisation Act 2008

As signalled during consultation and in the recently-released *Te rautaki para | New Zealand Waste Strategy*, MfE is also currently working on a review of the WMA to improve or amend provisions and consider new provisions. The provisions for use of landfill levy funds and the administrative and decision-making processes around this use will also be reviewed and improved. As for the waste strategy, consultation on possible changes took place during November/December 2021.

This review will also consider whether, and how, the Litter Act (1979) could be reviewed to better integrate with and support the WMA. In July 2023, MfE proactively released cabinet papers, a regulatory impact statement, and minutes of decisions for the initial stages of this process (occurring during March 2023). These proposals include the intention to replace the WMA and the Litter Act with a new single Act.

The WMA has been amended by the 2021 waste disposal levy regulations³, which set out the progressive increase and expansion of the landfill levy starting 1 July 2021; and supplemented by regulations banning specific items, including microbeads⁴ (2017), plastic shopping bags⁵ (2018), and numerous tranches of plastics packaging during 2022 and 2023, as described in section **Error! Reference source not found.**

Currently, the WMA provides for half of the revenue from the waste levy to be distributed to territorial authorities (Tas). These funds are provided pro rata, based on population, and must be spent on waste minimisation and in accordance with each authority’s Waste Minimisation and Management Plan (WMMP).

The waste disposal levy is outlined further in the following subsection.

1.5.4 Waste Disposal Levy and Information Reporting

In April 2021 the government introduced regulation to expand the scope of the levy from Class 1 landfills to also include classes 2-4,⁶ and to require operators of industrial 9onofils and Class 5 fills to report data on the quantity of waste received. Section 2.1 defines the different types and classes of fills.

The table below shows the timetable and rates for the new levy regime:

Table 1: Levy Rates by Disposal Facility Type and Year

DISPOSAL FACILITY CLASS	1-Jul-21	1-Jul-22	1-Jul-23	1-Jul-24
Municipal landfill (class 1)	\$20	\$30	\$50	\$60
Construction and demolition fill (class 2)		\$20	\$20	\$30
Managed fill (class 3)			\$10	\$10
Controlled fill (class 4)			\$10	\$10

<https://www.mfe.govt.nz/waste/waste-and-government>

As the landfill levy is expanded and raised, there will be an impact on the quantity of material going to the different destinations; however, the extent to which this occurs, and

³ <https://www.legislation.govt.nz/regulation/public/2021/0068/latest/LMS474556.html#LMS474591>

⁴ https://www.legislation.govt.nz/regulation/public/2017/0291/latest/DLM7490715.html?search=ts_act%40bill%40regulation%40deemedreg_microbeads_resele_25_a&p=1

⁵ <https://www.legislation.govt.nz/regulation/public/2018/0270/6.0/whole.html>

⁶ <https://www.legislation.govt.nz/regulation/public/2021/0069/latest/whole.html>

for which materials, depends on a number of other factors. The potential impacts are explored further in appendix A.4.0.

The requirement for all fills to at least report data on the quantity of waste received will provide much greater understanding of the role that all types of facilities play in waste management. These requirements take effect from the beginning of 2023 at the latest with Class 3/4 disposal facilities, cleanfills, transfer stations, and industrial monofills the last to start reporting (from 1 January 2023).

Anecdotally, there is evidence that some facilities are choosing to close rather than comply with the requirements to register and pay the levy and/or report waste quantities.

1.5.5 Emissions Trading Scheme (ETS)

Since 2013, Class 1 landfill owners have been required by the Climate Change (Emissions Trading) Amendment Act 2008 to surrender emission units to cover methane emissions. If any solid waste incineration plants are constructed, this act would also require emission units to be surrendered to cover greenhouse gas emissions from the incineration of household wastes.

The number of emissions units that needs to be surrendered is based on a calculation of how much methane is generated from a tonne of waste. As a starting point, landfills use a default emissions factor for waste (DEF). This is the methane assumed to be generated by each tonne of waste and is currently set at 0.91 tonnes of CO₂-e (CO₂ equivalent) per tonne of waste.

However, landfill operators can reduce their liabilities under the ETS through use of a unique emissions factor (UEF). The UEF is a calculation of methane released by the specific landfill. This can be done by either capturing the methane that is generated or showing (based on the type of waste going into the landfill) that the landfill generates a different amount of methane to the default.

1.5.5.1 Carbon Price

The other component of the calculation of a landfill's liability under the ETS is the price of carbon. New Zealand units (NZU)⁷ currently change hands for between \$70 and \$85, with prices at \$77.50 at the time of writing⁸.

The cost of NZUs has been increasing steadily for the last couple of years, due largely to changes made to the types of offsets that are eligible under the ETS. Class 2-5 landfills and closed landfills (along with certain other excluded landfills) are not currently covered by the ETS.

The implications of the ETS and carbon prices are explored further in appendix A.4.8.

⁷ NZUs are carbon credits that are officially accepted to offset liabilities under the NZETS

⁸ Accessed from <https://www.carbonnews.co.nz/tag.asp?tag=Carbon+prices>

1.5.6 Other Relevant Initiatives

1.5.6.1 Container Return Scheme

Container return schemes (CRS) place a deposit on all containers when sold. This deposit can then be redeemed by consumers when they return the containers. These schemes are in wide use worldwide including Australia and are designed to promote higher rates of recovery of containers and reduce littering by providing an incentive to consumers.

In 2019, a WMF-funded project led by Auckland Council and Marlborough District Council embarked on the research and design of a potential container return scheme for New Zealand. The outcomes from this project were reported to MfE, who have analysed the information and produced advice for ministers.

MfE consulted on a detailed implementation proposal for a container return scheme in New Zealand. This was included in the 'Transforming Recycling' consultation document.

The consultation document proposed a deposit of 20c per container for a wide range of beverage containers, excluding 'fresh milk' (the logic being that this product is rarely consumed outside the home). Depending on the details of the eventual CRS, and the extent to which containers may be captured in the scheme, two key effects on household kerbside recycling collections are likely:

- The quantity of containers collected in a kerbside collection would reduce; and
- The value of containers that are part of the CRS, but are still collected in a kerbside collection, will likely result in income for the 'owner' of the items. Usually, the owner is either the Council and/or its contractor.

Possible implications for Councils may be that the frequency of recycling collections could be reduced due to lower volumes of material.

In early 2023, government announced that the CRS development would be put on hold. This position has since been softened to a 'delay' but it remains unclear when, or how, a CRS would be introduced for New Zealand.

1.5.6.2 Kerbside Standardisation

In 2019, WasteMINZ was commissioned by MfE to complete a national review of kerbside collections and make recommendations as to how to achieve consistency across the country. The report was completed in 2020⁹, and MfE then considered implementing the three main recommendations:

1. A standard set of items accepted in kerbside recycling collections
2. Glass collected separately to other material streams
3. A weekly kerbside food scraps collection service for households.

⁹ <https://www.wasteminz.org.nz/wp-content/uploads/2020/08/Final-1.0-Standardising-Kerbside-Collections-in-Aotearoa.pdf>

MfE consulted on a detailed implementation proposal for kerbside standardisation in New Zealand. This was included in the 'Transforming Recycling' consultation document¹⁰.

The proposals included, alongside the points above from the original review, options to achieve the diversion of food scraps from businesses. The three possible options set out in the consultation document are:

- Phasing in source-separation of food scraps only from businesses that produce or sell food;
- Phasing in source-separation of food scraps from all businesses; or
- Prohibiting the disposal of food scraps to landfill entirely (which would also preclude disposal of food scraps from household sources).

In March 2023, MfE announced its decisions regarding kerbside standardisation alongside the release of Te rautaki para /New Zealand Waste Strategy. The key aspects are:

- Standardising materials in existing council kerbside recycling collections by 1 February 2024 to: glass bottles and jars, paper and cardboard (including pizza boxes), plastic bottles and containers grades #1, #2, and #5, and aluminium/steel tins and cans.
- Requiring council kerbside recycling to be provided to households in urban areas (defined as those with more than 1000 people¹¹) by 2027
- Council food scraps collections to be provided to households in urban areas (defined as above) by 2030, or earlier if a nearby processing option is available¹²

MfE advise it will also be working on business food scrap diversion by 2030.

Kerbside standardisation excludes tetrapak and other gabletop/liquid paperboard containers, foil, aerosols, soft plastics, polystyrene, and plastic bottles and containers other than those mentioned above. Councils will have the discretion to choose whether or not to include compostable bin liners in organics collections, and can also choose whether to collect glass separately or comingled with other materials.

Kerbside standardisation will only apply to council-provided services (either in-house or via a contractor) for now, with the hope that the private and community sector will choose to align their kerbside services with these requirements. However, MfE have indicated that they intend to provide for kerbside standardisation to be regulated more widely through the new version of the WMA.

The kerbside standardisation changes also include performance standards for household waste kerbside diversion, and reporting requirements for private waste companies.

The performance standards relate to kerbside recycling and food waste, and set an increasing proportion of all household kerbside waste (including that handled by private collections) diverted from landfill:

- 30% by July 2026

¹⁰ <https://environment.govt.nz/assets/publications/Transforming-recycling-consultation-document.pdf>

¹¹ As defined by StatsNZ as 'small urban areas', and shown on the StatsNZ Arc GIS system based on 2022 data.

¹² Defined as within 150km of a 'main centre'.

- 40% by July 2028
- 50% by July 2030

Councils that do not comply with the requirements to collect a standard set of kerbside recycling materials, and/or meet the minimum diversion requirements, can have all or part of their waste levy allocation withheld. Once withheld, this is not available at a later date (i.e. even if the council becomes compliant shortly after the due date, the levy funds will not then be released). Councils and private collectors will report their diversion figures to MfE, and MfE will advise the overall performance for the district or city.

Councils that do not comply with the requirement to provide a kerbside recycling and food scraps collection service to householders in applicable urban areas will not, at this point, have waste levy funds withheld; however, it is likely that there will be regulatory requirements introduced for these aspects at a later date, and it would be very difficult for a council to achieve the minimum diversion requirements without having these services in place.

The performance requirements will be enacted by a gazette notice under the WMA, and the two household kerbside collection provisions will be enacted by a regulation issued by the Governor-General.

Waimakariri's services are largely aligned with kerbside standardisation, except that aerosols will need to be removed from the kerbside recycling collection by 1 February 2024; and a few items will need to be removed from the food scraps and garden waste collection – paper hand towels, serviettes and (potentially) tea bags.

Areas that kerbside collections must be provided to in the district include Kaiapoi, Rangiora (both 'medium' urban areas), Pegasus, Woodend, and Oxford.

1.5.6.3 TA Performance Reporting

In addition to the proposals for a container return scheme and the standardisation of kerbside recycling, the MfE's consultation also covered a number of related issues.

One of these was the requirement for TAs to report to MfE on a number of performance standards/targets; including a minimum 50% diversion standard for dry recyclables and food scraps in kerbside collections. This is supported by a 70% high performance 'stretch target' which would be non-enforceable, but is intended to further encourage and motivate TAs.

The proposal was that the minimum standard would need to be achieved by 2030, to align with timeframes proposed in the draft New Zealand Waste Strategy and the ERP.

Some TA performance targets have now been confirmed in the outcomes from the kerbside standardisation, as discussed in the section above.

1.5.6.4 Priority Products

The WMA enables a product to be named as a 'priority product'. Once a product has been named such, an extended producer responsibility approach must be taken and a regulated product stewardship scheme development.

The first six priority products were named under the WMA in 2020 (shown below) and subsequently single-use packaging has been added. The first seven priority products named are:

1. Plastic packaging
2. Tyres
3. Electrical and electronic products (e-waste including large batteries)
4. Agrichemicals and their containers
5. Refrigerants
6. Farm plastics
7. Single-use plastic packaging

MfE has taken a ‘co-design’ approach, which involves industry developing and operating product stewardship schemes with central government oversight. Progress on the schemes, and parties involved, are summarised below.

Priority product	Progress made	Lead agency/ies
Tyres	Consultation on proposed regulations late 2021 Scheme accredited October 2020 Regulation in effect from late 2023	Tyrewise
Large batteries	Consultation on proposed regulations late 2021 Accreditation expected late 2023 Regulation in effect from 2024	Battery Industry Group
Refrigerants (and other synthetic greenhouse gases)	Consultation on regulations in late 2022 Scheme accreditation mid 2023 Regulation in effect from 2024	Synthetic Refrigerant Stewardship group
Farm plastics, agrichemicals and containers (farm waste)	Consultation on regulations planned late 2023	The Agrecovery Foundation
Electrical and electronic products (e-waste)	Scheme design in 2023 Consultation on regulations in 2024	TechCollect
Plastic packaging	Co-design underway	Packaging Forum and Food & Grocery Council

1.5.6.5 Product Bans

In April 2022, MfE announced that regulations had been passed to enable the implementation of the first tranche of bans for problematic plastic items. These regulations include:

- Plastic cotton buds;
- Plastic drink stirrers;
- Oxo- and photo-degradable plastic products;
- Certain PVC food trays and containers (pre-formed and rigid);
- Polystyrene takeaway packaging; and
- Expanded polystyrene food and beverage packaging.

The bans took effect from 1 October 2022.

From 1 July 2023 the following plastic items have been banned:

- Single-use plastic produce bags;
- Single-use plastic tableware and cutlery;
- Plastic straws¹³; and
- Non-home compostable plastic produce labels (phase-out by 2030)¹⁴.

One more ‘tranche’ of bans is planned. From mid-2025, all other PVC and polystyrene food and beverage packaging will also be banned.

1.5.6.6 Infrastructure Investment Strategy

With the increased and expanded landfill levy comes an increased pool of funds that can be invested in waste management and minimisation initiatives.

MfE is developing a proactive strategic investment plan for waste infrastructure, supported by a detailed stocktake of current infrastructure and prioritisation of possible new infrastructure. The goal of this work is to give a national view of the waste investment New Zealand needs over the next 15 years.

The outcomes will be incorporated into the action and investment plan that will supplement Te rautaki para, and will be released in the first half of 2024.

In April 2023, MfE released a summary report of the infrastructure assessment carried out by Eunomia in 2021¹⁵.

1.5.6.7 Data and Monitoring

Alongside the increase and expansion of the waste levy, MfE is developing protocols to collect data from the additional facilities that will now be paying the landfill levy (Class 2-4 landfills).

MfE has also adopted regulations that enable the collection of some data from Class 5 fills and transfer stations¹⁶, and has proposed an approach for performance reporting by TAs in the current consultation. These protocols will be included in the revised National Waste Data Framework, which will be completed in mid-2023.

¹³ Apart from sales to disabled people and those with health conditions

¹⁴ Produce labelled before 1 July 2023, and already in the supply chain, is not affected. Label adhesive, and labels on imported produce, must be home compostable by 1 July 2025.

¹⁵ Eunomia (2023) “Waste and Resource Recovery Infrastructure and Services Stocktake Summary Report”, available at www.mfe.govt.nz

¹⁶ <https://www.legislation.govt.nz/regulation/public/2021/0069/latest/whole.html>

MfE has also indicated that it is likely the new Waste Minimisation Act will also include requirements for waste operators to be licensed by a central agency, and to report data on the quantities of waste handled; and that requirements for construction site waste management plans (SWMP) will be included in a revision of the Building Act. It is not clear what the timeframes or specific requirements will be for these.

1.5.7 Resource Management Act Review

Government has resolved to replace the Resource Management Act (RMA) with two new Acts; the Spatial Planning Act, and the Natural and Built Environment Act. These are currently making their way through Parliament as Bills.

The increased abilities and requirements for spatial planning will have a positive impact on waste management; in particular infrastructure, as demand and supply of waste infrastructure will be an essential consideration under a spatial planning approach.

However, there is no specific reference to waste in the Bills, and so the extent to which waste planning will be undertaken successfully for the Canterbury region (by the applicable Regional Planning Committee) will depend on local implementation of the provisions.

The Bills both propose a more significant role for iwi in regional-scale planning, which could result in an approach that is more aligned with te ao Māori principles and a circular economy approach to waste management and minimisation.

1.5.8 International Commitments

New Zealand is party to the following key international agreements:

- 1) Montreal Protocol – to protect the ozone layer by phasing out the production of numerous substances
- 2) Basel Convention – to reduce the movement of hazardous wastes between nations
- 3) Stockholm Convention – to eliminate or restrict the production and use of persistent organic pollutants
- 4) Waigani Convention – bans export of hazardous or radioactive waste to Pacific Islands Forum countries.

These agreements are explained in more detail in appendix A.4.0.

1.6 Local and Regional Planning Context

This Waste Assessment and the resulting WMMP will have been prepared within a local and regional planning context whereby the actions and objectives identified in the Waste Assessment and WMMP reflect, intersect with, and are expressed through other planning documents. Key planning documents and waste-related goals and objectives are noted in this section.

Council is a member of the Canterbury Waste Joint Committee (CWJC), through which the nine councils of the Canterbury region collaborate on a number of waste minimisation projects. The CWJC has recently employed a regional waste projects officer.

1.6.1 Long Term Plan

Council's current LTP was adopted in June 2021, with Council's purpose stated as to "make Waimakariri a great place to be, in partnership with our Communities, guided by our outcomes".

The LTP includes a number of community outcomes, which describe how Council aims to meet the needs of the community. Relevant community outcomes for waste include that:

- Effect is given to the principles of the Treaty of Waitangi
- There is a healthy and sustainable environment for all
- Core utility services are sustainable, resilient, affordable and provided in a timely manner (with a specific point that waste, recycling, and re-use of solid waste is encouraged and residues are managed so that they minimise harm to the environment)

The LTP highlights a few demographic factors with particular impacts on solid waste management, such as:

- an increasingly elderly population could result in less waste, as smaller households with older residents tend to produce less;
- this effect could, however, be offset to an extent by an increase in age-related medical waste;
- increasing numbers of residents living in aged care facilities that use private waste services may see Council's market share decrease; and
- an increasing population and new residential areas in the district could drive demand for new facilities such as transfer stations.

Several waste-related projects are planned during the term of the LTP –

- An upgrade of the Southbrook Resource Recovery Park (SRRP) reuse and recycling area and education centre during 2021 – 2024;
- An upgrade of the SRRP disposal pit in two stages between 2021 and 2025; and
- A further expansion of the SRRP indicated during 2037 – 2039.

The LTP also specifically notes the landfill levy expansion and increase, and the impact this will have on Council's solid waste charges; and that proposed new reporting requirements may necessitate some capital works and operational changes at the Oxford refuse transfer station (RTS) and two other disposal sites. The LTP indicates that the cost of these upgrades could potentially be funded from Council's levy funding.

The principal goal for solid waste management is "to provide an effective and efficient service for households and businesses to dispose of waste at an affordable cost, and encourage practices that minimise waste generation".

1.6.2 Canterbury Regional Council

The Canterbury Regional Policy Statement (CRPS) became operative on 15 January 2013. The CRPS provides an overview of the resource management issues in the Canterbury region, and the objectives, policies and methods to achieve integrated management of natural and physical resources. Other Regional Plans and District Plans cannot be inconsistent with the CRPS.

Chapter 19, Waste Minimisation and Management, contains objectives and policies for waste management in the region and methods to achieve them.

Objective 19.2.1 – Minimise the generation of waste

Adverse effects on the environment are avoided by minimising the generation of waste.

Objective 19.2.2 – Minimise adverse effects of waste

Adverse effects on the environment caused by residual waste and its management are avoided, remedied or mitigated.

Policy 19.3.1 – Waste management hierarchy

To apply the principles of the 5Rs (Reduce, Reuse, Recycle, Recover, Residual waste management) hierarchy to the management of all waste streams.

This policy implements the following objectives: Objective 19.2.1, Objective 19.2.2

Methods:

The Canterbury Regional Council:

Will: (1) Set out objectives and policies, and may include methods in regional plans to manage the disposal of residual waste through the control of disposal processes and practices. (2) Set out objectives and policies, and may include methods in regional plans that will require consideration of the adverse waste effects with regard to discharges to land, air and water and in any land-use over which a regional plan has control.¹⁷

Should: (3) Advocate the implementation of the 5Rs principles throughout the Canterbury region. (4) Support product stewardship programmes aimed at the reduction of waste. (5) Advocate for and encourage the reuse of materials, particularly in industry.

Territorial authorities:

Should: (6) Set out objectives and policies, and may include methods in district plans specifically seeking to reduce the potential waste generated as a result of the use of land. (7) Take into account the 5Rs hierarchy when considering waste management options and plans (including, but not limited to district plans) for their districts.

Local authorities:

Will: (8) Engage with Ngāi Tahu as tāngata whenua and use iwi management plans to assist in informing them of Ngāi Tahu values associated with the management of waste, and of methods to avoid conflict with particular values in the application of the 5Rs principles.

Policy 19.3.2 – Reduce waste at the source

Promote a change in behaviour that will result in the reduction of waste at the source.

This policy implements the following objectives: Objective 19.2.1, Objective 19.2.2

Methods:

¹⁷ Both the Canterbury Land & Water Regional Plan and the Canterbury Air Regional Plan address some of the adverse waste effects.

The Canterbury Regional Council:

Should: (1) Develop public education initiatives throughout Canterbury that endorse the 5Rs, with particular focus on reduction of waste through consumer choice. (2) Advocate for stronger national guidance and incentive for reducing waste, particularly at the manufacture/ production/import stage.

Policy 19.3.3 – Integrated management of waste

Promote an integrated approach to waste management in the region.

This policy implements the following objective: Objective 19.2.2

Methods:

The Canterbury Regional Council:

Should: (1) Support territorial authorities to maintain an integrated approach to management of waste in the region. (2) Advocate, to, and cooperate and coordinate, with territorial authorities, central government, Kāi Tahu and industry, to achieve an integrated approach to the management of waste.

Policy 19.3.4 – Establish community waste transfer facilities

Enable the establishment and use of appropriate community facilities and services such as waste-transfer facilities and recycling centres throughout the region.

This policy implements the following objective: Objective 19.2.2

Methods:

The Canterbury Regional Council:

Should: (1) Encourage the use of community waste-transfer facilities and recycling centres through education and, where appropriate, enforcement action. (2) Support Government and industry-led product stewardship programmes

Territorial authorities:

Will: (3) Set out objectives and policies, and may include methods in district plans to enable the establishment of waste transfer facilities in appropriate locations. Should: (4) Encourage and promote the use of community waste transfer facilities.

The regional council has also adopted a Land and Water Regional Plan which was last significantly updated in 2018.

There are several relevant points from the Plan with respect to waste management:

- Disposal of less than 50m³ to land that is not excavated to more than 5 metres in depth is a permitted activity
- Disposal of more than 50m³ to land to land that is excavated more than 5 metres in depth is a controlled activity, provided the material is cleanfill (which is aligned with nationally-accepted definitions of cleanfill)

This essentially makes the majority of true cleanfills (Class 5) in the region a controlled activity.

1.7 Our District

This section presents a brief overview of key aspects of the district's geography, economy, and demographics. These key aspects influence the quantities and types of waste generated and potential opportunities for the Council to manage and minimise these wastes in an effective and efficient manner.

The figure below shows the Waimakariri district, and its location within the wider Canterbury region.

Figure 3: The Canterbury Region



Rangiora is the district's principal settlement, and along with other towns nearby Kaiapoi, Pegasus, and Woodend accounts for more than 80% of the population. Oxford, to the west, is the other main town in the district. The district also has a number of smaller villages and four coastal settlements. All towns of the district are within commuting distance of Christchurch.

The 2021 LTP estimated the 2020 population of the district to be 64,700 (around 25,000 households), with strong population growth a key demographic feature; with the population expected to exceed 80,000 by 2033.

The number of households is forecast to increase slightly faster than population, which will then result in a reduced average household size from 2.59 currently, and compared to the national average of 2.7 people per household.

Waimakariri's population is also ageing, with the proportion of the population aged over 65 years increasing from 19.0% in 2018 to 19.8% in 2020; and the district's median age is slightly higher than the national average.

1.7.1 Tangata Whenua

The area now known as the Waimakariri district historically hosted the primary pa of Kāi Tahu, in what is now known as Kaiapoi. The local hapu is Kai Tūāhuriri, which signed a memorandum of understanding with Council in 2003 (renewed in 2012).

Council and the Runanga hold annual hui, covering a number of issues including consideration of possible long-term plan and annual plan content.

A joint development committee, Mahi Tahi, was established in 2019 to enable joint decision-making about issues that impact both organisations, with three representatives from Te Kāi Tūāhuriri Runanga and three from Council. This is supported by bi-monthly forums.

2 Waste Infrastructure

The facilities available in Waimakariri are a combination of those owned, operated and/or managed by Council, and those that are owned and/or operated by commercial entities or community groups.

This inventory is not to be considered exhaustive, particularly with respect to the commercial waste industry as these services are subject to change. It is also recognised that there are many small private operators and second-hand goods dealers that are not specifically listed. However, the data is considered accurate enough for the purposes of determining future strategy and to meet the needs of the WMA.

2.1 Disposal Facilities

In 2021, MfE adopted regulations to extend the landfill levy and apply information requirements to facilities that do not pay the landfill levy. These regulations also established legal definitions for disposal facilities.

Previously, disposal facilities had been categorised according to the 2016 Waste Management Institute of New Zealand (WasteMINZ) Technical Guidelines for Disposal to Land.¹⁸ As there are differences, albeit slight, between the two; the legal definitions take precedence¹⁹.

The definitions of the six classes of disposal facilities in the regulations are summarised below.

Class 1 - Municipal Disposal Facility

Accept any of the following:

- Household waste
- Waste from commercial or industrial sources
- Waste from institutional sources
- Green waste
- Waste that is not accepted at Class 2-5 disposal facilities.

Class 2 – Construction and Demolition Disposal Facility

Accepts waste from construction and demolition activities. Does not accept Class 1 waste.

Classes 3 and 4 – Managed or Controlled Fill Disposal Facility

Accepts any of the following:

- Inert waste material from construction and demolition activities
- Inert waste material from earthworks or site remediation

Does not accept Class 2 waste.

¹⁸ www.wasteminz.org.nz/pubs/technical-guidelines-for-disposal-to-land-april-2016/

¹⁹ www.legislation.govt.nz; It is likely that the Technical Guidelines will be revised so it is aligned as closely as possible with the MfE definitions.

Class 5 – Cleanfill

Accepts only virgin excavated natural material (such as clay, soil, or rock) for disposal

Industrial Monofill

A facility that accepts disposal waste that:

- Discharges or could discharge contaminants or emissions
- Is generated from a single industrial process (e.g. steel or aluminium making, or pulp and paper making) carried out in one or more locations.

The actual wording used in the regulations and examples of types of waste accepted at each facility is provided in Appendix A.4.0.

The regulations also define a transfer station as a facility that receives waste and where waste is then transferred to a final disposal site or for further processing. Significantly, if a site does not accept waste that is then transferred to a final disposal site (i.e. residual waste), it is not a transfer station (but is instead a recycling drop-off site or similar) and isn't required to report data.

2.1.1 Class 1 Disposal Facilities

There are no Class 1 disposal facilities within the district.

Waste from the district is disposed of at Kate Valley landfill in the Waipara area of Hurunui District. The landfill facility is currently consented to 2040. The landfill facility and transportation of waste to the facility is operated by Transwaste Canterbury Ltd.

The Waimakariri District Council is a shareholder in Transwaste Canterbury Ltd, a joint venture company with four other Canterbury Councils (50% shareholding), and Canterbury Waste Services Ltd (50% shareholding). Canterbury Waste Services is 100% owned by Waste Management NZ Ltd. Transwaste Canterbury have had a gas capture unique emissions factor (UEF) in place since 2017 of 0.119 which, compared to the national average, suggests the maximum 'allowable' gas capture under the emissions trading scheme of 90%.

Particularly given the council's involvement in the ownership and governance of Kate Valley landfill, it is considered that this is a reliable disposal avenue that will be available for some time into the future.

2.1.2 Transfer Stations and Recycling Drop-off Points

Refuse transfer stations or resource recovery parks (RRPs) and recycling drop-off points (RDOPs) provide for those that can't or choose not to make the journey to a disposal facility. Waste can be dropped off at these sites by the public and commercial collectors after paying a gate fee, and the waste is subsequently compacted before transport to a Class 1 disposal facility.

Council operates two RTS, located in Rangiora (part of SRRP) and Oxford, which are operated by Waste Management Ltd under contract to Council. Waste from Oxford RTS is transported to the RTS at SRRP and then to Kate Valley landfill.

A private RTS opened in Rangiora in July 2023, which accepts kerbside rubbish and bulk waste and bulks this for transport to Kate Valley.

The SRRP is a well laid-out and maintained site. A wide range of materials can be diverted through the SRRP, including:

- usual household recyclables;
- whiteware and scrap metal;
- electronic and electrical equipment (charges apply);
- greenwaste (at a charge);
- household hazardous waste (up to 20 litres or 20kg) including chemicals, fuels, oil, paint, household batteries and CFL bulbs;
- large lead-acid batteries;
- reusable items including household goods and furniture;
- clean polystyrene packaging (a charge applies to large loads);
- child safety restraint recycling (charges apply);
- cleanfill (at a charge); and
- laminated window glass (at a charge).

There is a reuse shop at the SRRP.

There is a smaller RTS in Oxford which accepts a smaller range of items –

- usual household recyclables;
- whiteware and scrap metal;
- electronic and electrical equipment (charges apply);
- greenwaste (only branches suitable for mulching); and
- household hazardous waste (up to 20 litres or 20kg) including chemicals, fuels, oil, paint, household batteries and CFL bulbs.

There is also a small RDOP provided by Council in Cust, for rural residents who live in the vicinity, which accepts the usual household recyclables.

2.1.3 Closed Landfills

Council manages five closed landfills at Rangiora, Kaiapoi, Oxford, Mandeville, and Cust. Landfill management plans are in place for the sites, which ensure consent compliance and identification/monitoring of potential risks including those to public health.

2.1.4 Class 2-5 Landfills

Research estimates that waste disposed of to land other than in Class 1 landfills accounts for approximately 70% of all waste disposed of, and these operators are not required currently to pay the waste levy to central government and some have only recently started reporting waste quantity data.²⁰ Other disposal sites include Class 2-5 fills and farm dumps.

The Waimakariri District Plan²¹ defines cleanfill:

²⁰ Ministry for the Environment (2014) Review of the Effectiveness of the Waste Disposal Levy. The report estimates 56% of material disposed to land goes to non-levied facilities, 15% to farm dumps and 29% to levied facilities.

²¹ OPERATIVE DISTRICT PLAN August 2014

“includes any natural material which is free of: combustible, putrescible, degradable or leachable components or materials likely to create leachate by means of biological breakdown; hazardous substances or any products or materials derived from hazardous waste treatment, stabilisation or disposal practices; contaminated soil or other contaminated materials; medical or veterinary waste; asbestos or radioactive substances. It includes (but is not limited to) clay, rock, concrete and bricks”

This definition is very similar to, but not exactly the same as, the Ministry for the Environment’s Cleanfill Guidelines which also exclude liquid waste.²²

The District Plan has defined various Permitted Activities including:

Deposition of clean fill, not including deposition of any demolition material; limited to:

- *the Rural A and B zones, and*
- *a maximum of 200m³ on any one site per annum.*

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.”*

Class 2-5 landfills can be an issue for effective and efficient waste management as, for some materials, these disposal sites are competing directly with other options such as composting sites and Class 1 landfills. However, Class 2-5 landfills are much less costly than Class 1 landfills to establish and require much lower levels of engineering investment to prevent discharges into the environment. Class 2-5 landfills also have much lower compliance costs than Class 1 landfills and are not required to pay the waste levy at this time. Because of these differing cost structures, Class 2 landfills charge markedly less for disposal than Class 1 landfills.

From 1 July 2022, Class 2 disposal facilities have been required to pay the levy at a rate of \$20 per tonne (going up to \$40 per tonne in 2024). Class 3 and 4 disposal facilities will be required to pay the levy from 1 July 2023 at a rate of \$10 per tonne. True Class 5 disposal facilities (accepting VENM only) will not be required to pay the levy, but have been required to report on quantities from 1 January 2023.

²² Ministry for the Environment (2002) ‘A Guide to the Management of Cleanfills’.

Class 2 disposal sites and RTS were required to start reporting data on waste quantities from 1 January 2022.

Following these changes, MfE will hold data on the quantities of waste disposed of at these sites and are in the process of developing a database of Class 2-5 facilities around the country. This data indicates that, so far, five sites have been identified in the Waimakariri district (three owned by Council, and two privately owned).

Of the three Council sites, two are operational managed landfills (classified as Class 3/4) located at West Eyreton ('Garterys Pit') and Fernside ('Sutherlands Pit') which are only available to customers registered with Council. All three Council-owned sites, including 'Woodstock Pit', are active quarry sites, and the road maintenance contractor is also consented to dispose of materials arising from their road maintenance works: these quantities are included in the monthly reporting figures.

Council is required to report to MfE on the quantities of waste disposed of at these sites, which is challenging under current operational practices with data based on self-reporting and converting volumes to weight. At some stage, Council is likely to also need to report on the activity sources of waste.

In some parts of New Zealand, Class 2/3/4 landfills are indicating that they will close before the deadline to register and pay the levy of 1 July 2022. There has been no indication as yet that any of the sites in Waimakariri would close.

2.2 Hazardous Waste Facilities and Services

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 waste 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.

A range of treatment processes are used before hazardous wastes can be safely disposed.

Most disposal is either to Class 1 landfills 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 require exporting for treatment.

These include polychlorinated biphenyls, pesticides, and persistent organic pollutants.

There are four participants in the local hazardous waste market; EnviroNZ Technical Services, Waste Management Technical Services, Prime Environmental, and Charlie's

Takeaways. Agrecovery provides hazardous waste management services for agricultural properties.

Household hazardous waste can be taken to the Southbrook and Oxford RTSs.

2.3 Waste Water Treatment

As outlined earlier in this report, waste water treatment is considered where it results in waste being managed through solid waste systems.

Wastewater management is covered by the wastewater activity plan, last updated in 2021.

Council manages four wastewater schemes supported by seven waste water treatment plants (WWTPs). The remainder of the properties in the district largely manage their wastewater through domestic septic tank systems, which can be serviced by one of a number of operators based in or near the district.

Sludges from the Oxford WWTP is dewatered and transported to Bromley WWTP in Christchurch, which then sends screenings to Kate Valley landfill. Sludges from settlement ponds are pumped into BioBags²³ and held in bunded areas while composting; with any leachate pumped back into the ponds. Once processing is complete, the contents of the BioBags will either be used as planted bunding (if heavy metal levels are too high) or used on site as topsoil (if heavy metal levels are low enough).

The future of wastewater management in the district, as across New Zealand, is currently somewhat uncertain depending on the implementation of the national three waters management proposals.

2.4 Recycling and Reprocessing Facilities

The main facility is the SRRP, with a more limited range of diversion options available at the Oxford RTS.

There are a number of other recycling and reprocessing facilities that accept material from the Waimakariri district. The key facilities are listed below.

Table 2: Other Recycling and Reprocessing Facilities

Name/Operator	Key services/waste streams	Location
5R	Window glass and colour-separated glass bottles and jars	Christchurch
Canterbury Landscape Supplies	Green waste	Kainga, Waimakariri District
Daltons	Various organic wastes	Christchurch

²³ <https://biobagworld.com/environment/biobag-waste-management/>

Eco Central	Comingled kerbside recycling from Council collections	Christchurch
Waste Management NZ Ltd	Commercial fibre (paper/cardboard), some plastics, polystyrene	Bromley, Christchurch
Living Earth	Garden waste (alongside waste from Christchurch City Council's and Waimakariri District Council's organic waste collections)	Christchurch
Multiple providers	Truck/tractor tyres, some smaller tyres	Christchurch
OJI Fibre Solutions	Recovered paper/cardboard fibre	Auckland
WasteCo	Some timber construction and demolition wastes	Christchurch
EnviroNZ	Industrial wastes and commercial recycling	Bromley, Christchurch
Various scrap metal recovery providers	Wide range of scrap metal; shredders located at MetalCorp and SIMS	Christchurch
Various e-waste recycling providers	Wide range of electronic and electrical waste	Christchurch, Amberley, Auckland, Wellington
Product stewardship	Agricultural plastic, containers, and chemicals	Various locations

In addition, there are a large number of charity shops, second-hand stores, and smaller scrap metal recyclers that have a role in diverting material from landfill disposal.

While many material types are transported out of the district and even out of the region for recycling and reprocessing, this is not an unusual situation in New Zealand and particularly in the lower South Island.

The availability of infrastructure that is accessible directly by residents and businesses, as opposed to by Council and its contractors, is not as extensive. However, SRRP offers a comprehensive range of services at a site with sufficient capacity for current material flows.

2.5 Assessment of Infrastructure

The Waimakariri district has reasonable access to infrastructure, particularly with the EcoCentral MRF located not far away and the regional landfill Kate Valley.

There is a lack of processing infrastructure for mixed C&D waste – provision for this material stream is poor nationally, outside of Auckland and, to a lesser extent, central Wellington.

If a natural disaster affected the three main facilities used out of the district (landfill disposal at Kate Valley, mixed organics processing at Living Earth, and recyclables processing at

EcoCentral) alternative sites are at a significant distance – the nearest landfill is in Marlborough or Dunedin, and recyclables and organics could be sent to an EnviroNZ facility in Redruth, near Timaru.

3 Waste Services

3.1 Council-provided Waste Services

A range of services are provided by Council to residents and businesses in the district.

3.1.1 Collection Services

Council provides collection services to just over 70% of occupied households in the district. These households are mainly located within towns and villages, but households located on the roads between these areas are also able to receive kerbside collections.

In 2019, Council made significant changes to kerbside collection services. Up till this point, kerbside services had included a weekly collection of bagged rubbish, from pre-paid bags, and a fortnightly rates-funded kerbside recycling collection for all areas that received the kerbside rubbish collection, with the addition of Ohoka.

Services offered now include:

- the bag-based kerbside rubbish collection service augmented by a weekly 80L or 140L wheeled bin collection, with bins charged through rates;
- all rubbish collections are now fortnightly, alternating with the recycling collection;
- in addition to the 240L recycling bins, 80L and 140L bins are available; and
- an optional, user-pays weekly organics collection is available, once again from 80L, 140L or 240L wheeled bins, charged through rates. This service is for food scraps and garden waste and is not available in rural Ohoka.

The charges for these services for the 2023/24 financial year are:

Service Type	Small	Medium	Large
Rubbish	\$3.70 per bag or around \$3.60 for twenty-five or more	80L bin \$108	140L bin \$144
Recycling	\$113/rural \$103		
Organics	80L \$90	140L \$122	240L \$174

Charges also apply for changes in service during the year, and it is possible to pay for additional recycling and organics services.

All three kerbside collection services are available to commercial properties; however, this is a domestic service and is not always able to provide the levels of service required by commercial customers. Schools are provided additional recycling bins (maximum one for every three classes) on request at no charge and can request additional rubbish and organics bins at the standard rate.

These services are provided on behalf of Council by Waste Management NZ Ltd.

Roughly 19,900 properties can access recycling and rubbish bin collection services, and the split of preferred services is shown below. Some properties have multiple dwellings and can

receive and be rated for additional recycling bins, with organics and rubbish bins also available to these additional dwellings.

Service Type	Small (bag-based rubbish collection)	Medium (80L for rubbish)	Large (140L for rubbish)
Rubbish	3,163	4,394	11,330
Recycling	21,224		
Organics	4,109	5,267	3,726

This shows that over 65% of the households that have kerbside organics services available to them have chosen to subscribe to this service, and 75% of the households with kerbside rubbish bin services available to them have opted in to using the rubbish collection service.

3.1.2 Other Council Services

In addition to the services described above, there are other waste-related programmes and services provided by Council e.g. removal of illegal dumping, and provision of litter bins.

Council also operates the two RRP in Southbrook and Oxford.

3.1.3 Waste Education and Minimisation Programmes

Council provides a range of communication and education initiatives to inform ratepayers, schools and services users of the available waste services and to promote waste minimisation. Key communication and education initiatives that Council supports include:

- Waste minimisation education for businesses
- Zero waste education for schools and the community
- EnviroSchools programme for participating district schools
- Love Food, Hate Waste (national WasteMINZ-led initiative)

3.1.4 Solid Waste Bylaws

In addition to key strategic waste infrastructure assets, the Council also has responsibilities and powers as regulators through the statutory obligations placed upon them by the WMA. The Council operates in the role of regulator with respect to:

- management of litter and illegal dumping under the Litter Act 1979
- trade waste requirements
- nuisance related bylaws.

Council adopted its Solid Waste Management and Minimisation Bylaw in 2016²⁴, under the WMA (amongst other Acts). This means that the bylaw doesn't need to be reviewed until 2026.

The bylaw defines a 'waste operation' as "land or buildings to which waste is delivered for consolidation or for compaction and consolidation before being taken away for disposal; or any other land or buildings at which more than 30 tonnes of waste per annum is delivered and/or stored and then sent for disposal within the Council's district, or sent for further processing and/or disposal other than to Kate Valley Regional Landfill".

Waste operators require a licence from Council and operate according to terms and conditions of that licence – which includes the requirement to record data and report to Council.

The bylaw also includes:

- various minimum standards of handling and managing wastes from any property; and
- a number of other provisions intended to ensure waste is managed in a way that protects public health.

3.1.5 Summary of Council Services

Council's kerbside services are a fairly unusual combination of user-pays bags and bins, fortnightly recycling, and a mixed food scraps and garden organics (FOGO) collection. Few non-residential customers have access to these collections.

Over 65% of households have chosen to subscribe to the organics collection service, which is a high number for an optional service. A rates-funded organic waste collection service might be expected to achieve around 65-70% participation (usually defined as a household using the service at least once every four to six weeks). The proportion of households opting to subscribe to the organics collection service is considered to be analogous to a participation rate, on the assumption that a household would not pay for a service and then not use it at least once every few weeks.

A recent review of the provision of user-pays rubbish collection services by Auckland Council concluded that there was no significant waste reduction advantage in charging for residual waste collections as a user-pays service, rather than rates-funded. It appears that the main mechanism by which waste reduction can be encouraged is through restricting the capacity of residual waste collections, by providing smaller containers or by collecting less frequently.

This Council currently has the best of both worlds, by providing a user-pays bag service for households that only require a low capacity collection, while also providing a wheeled bin collection service that is apparently achieving a relatively high market share.

²⁴ https://www.waimakariri.govt.nz/_data/assets/pdf_file/0023/127094/Solid-Waste-and-Waste-Handling-Licensing-Bylaw-2016-Terms-and-Conditions-Amended-2019.PDF

Council's current approach of only providing smaller rubbish collection bins is likely to encourage the preferred behaviours such as recycling and other waste diversion, as long as restrictions remain in place on residual waste collection capacity.

3.2 Non-Council Services

Council does not provide kerbside collection services to businesses, unless they are eligible for the household kerbside collection service. Exceptions are made for schools which are provided additional recycling bins on request at no charge and can request additional rubbish and organics bins at the standard rate.

Instead, businesses can organise a rubbish collection service from one of the local private operators, or take rubbish directly to one of the RRP's for disposal. Private collection services are available from a number of private operators, but the market is dominated by Waste Management. Collections can be made from a range of containers ranging from drums and wheeled bins to large skip bins.

Several private operators also offer rubbish collection services to businesses and householders from 240L wheeled bins; such as Rangiora Rubbish Removal Ltd, Laffey Bins, Waimak Bins, WasteCo Ltd, and Waste Management.

Rural residents that are not able to access the Council's kerbside collection service can also have waste collected by private waste collection operators, as above.

3.3 Assessment of Services

The Council services include a number of variations on container types and sizes, which mean that customers have a high level of choice while still gaining the benefit of using Council-contracted services (usually better value than the private sector, due to economies of scale gains).

Some customers still use private kerbside rubbish collections, probably because they prefer to have a 240L wheeled bin provided. Based on data from elsewhere and previous surveys in the Waimakariri district, these customers are probably not diverting as much recyclables or organics as households that use smaller wheeled bins or bags for rubbish collections. In fact, the few 240L wheeled bins that were found in the recent audit contained around three quarters garden waste. These private kerbside services will also be used by rural properties that prefer a collection; although Council's service is available to a high proportion of households in the district (around 71%).

There are several companies providing commercial refuse collections, but only limited recycling collections focusing on common materials such as paper/cardboard and glass.

Council's FOGO collection is offered on a subscription or opt-in basis; even so, there is a reasonable level of uptake of the service. Changing the service to an opt-out service (where the service is provided to all eligible properties, apart from those that are exempted for reasons such as access or density) *may* result in a slight increase in capture of organic waste, through slightly increased participation. MfE is currently indicating that compliance with food scraps collection requirements will involve an opt-out service.

The kerbside recycling collection is currently fully comingled, as are all kerbside collections that feed into the EcoCentral MRF. Collecting glass separately could result in less loss of

recyclables through contamination; however, it would make sense for all councils using the EcoCentral MRF to make the decision to change the service structure cooperatively, with Christchurch being by far the biggest customer (and owner of EcoCentral as a CCO).

4 Situation Review

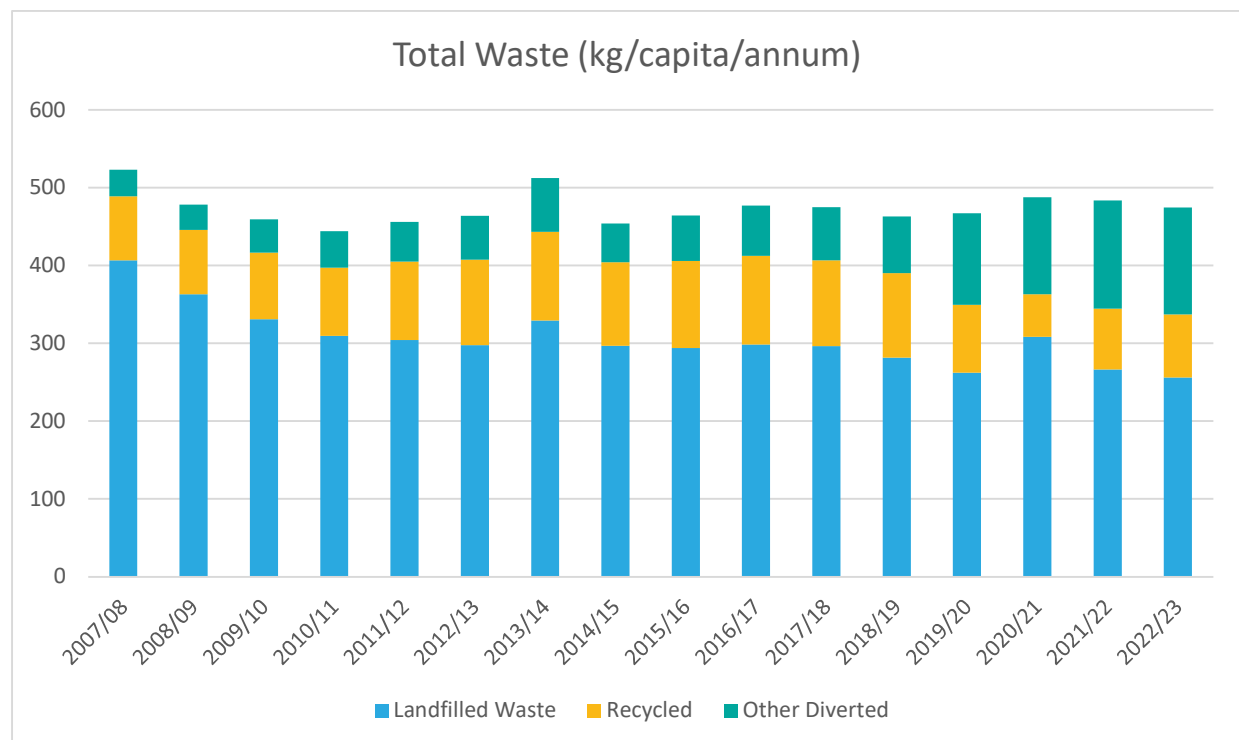
4.1 Waste to Class 1-5 Disposal

The terminology that is used in this section to distinguish sites where waste is disposed of to land are taken from the relevant MfE regulations, as discussed earlier in section 2.1.

4.1.1 Waste to Class 1 Disposal

The figure below summarises the historical waste flows in Waimakariri district, based on Council's records.

Figure 4: Waimakariri Waste Flows (2007 - 2021) (kg/capita)



The total waste to landfill from the district is roughly analogous to the quantity sent to Kate Valley landfill from the Southbrook RTS, shown below:

Table 3: Waste to Kate Valley Landfill from Southbrook RTS

Year	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023
Waste to landfill (tonnes)	14,761	16,800	16,136	16,582	17,258	17,545	17,080	16,464	19,953	17,658	17,394

There are several things to note:

- 1) There has been a notable increase in 'other diverted' since 2018/19, when the kerbside organics service started;

- 2) The increase in landfilled waste in 2020 related to ‘special wastes’, which in this case was contaminated kerbside recycling;
- 3) In July 2022 a private transfer station opened in the district and some waste, particularly ICI and C&D, will be reaching Kate Valley via this facility, estimated at 280 tonnes per month;
- 4) Overall, total waste quantities, per capita, have been reducing (apart from 2020).

It is estimated that, overall, another 65 tonnes of waste per week now reaches Kate Valley landfill without going through the Council’s facility first. This includes the waste sent to landfill from the new private RTS, and two collection companies collecting waste at the kerbside and disposing of this to facilities in Christchurch.

4.1.2 Waste to Class 2-5 Fills

There are no known Class 2 disposal facilities or industrial monofills in Waimakariri district, but five Class 3/4 landfills.

As discussed earlier in this report, there is very little information available regarding most cleanfilled waste as the Canterbury Regional Council considers these to be a controlled activity and does not require reporting on waste quantities.

A 2011 MfE report on non-levied disposal facilities stated:²⁵

No information about cleanfill quantities was compiled for this report because the few sites with available data are unlikely to be indicative of what is happening around the country.

Several other studies have attempted to quantify the disposal of waste to Class 2-5 fills, often on a per capita basis, with widely-varying results. In practical terms, the lack of precise data about disposal of waste to Class 2-5 landfills makes it impossible to reliably monitor any changes over time in the disposal of major waste streams, such as construction and demolition waste.

4.2 Composition of Waste

In September 2022, Waimakariri’s waste was surveyed on behalf by Waste Not Consulting Ltd. The composition data presented here is largely taken from the report presenting the results of the survey, completed in February 2023.

4.2.1 Composition to Class 1 Disposal

The composition of the overall waste stream being disposed of at Kate Valley from Waimakariri district (via Southbrook RTS and Oxford RTS) is shown below.

Table 4: Composition of All Waste to Class 1 Landfill

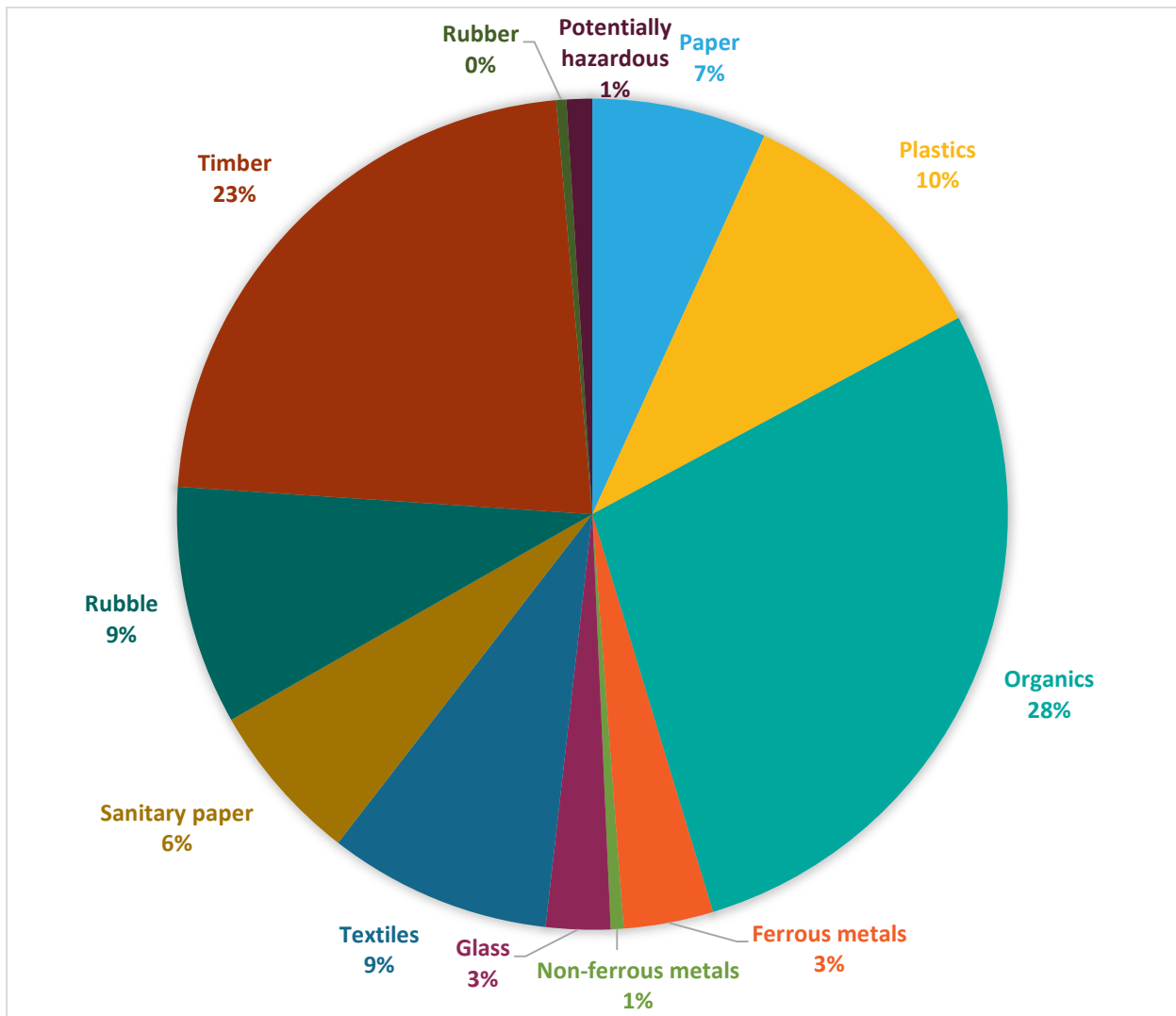
8 August – 18 September 2022	
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²⁵ Ministry for the Environment (2011) *Consented Non-levied Cleanfills and Landfills in New Zealand: Project Report*. Wellington: Ministry for the Environment

Southbrook and Oxford RTS – all waste to landfill	% of weight (%)	Tonnes/week (tonnes)	Tonnes per annum (indicative only, tonnes)
Paper	6.8	18	917
Plastics	10.4	27	1,404
Organics	28.2	73	3,809
Ferrous metals	3.5	9	479
Non-ferrous metals	0.5	1	65
Glass	2.5	6	331
Textiles	8.7	23	1,173
Sanitary paper	6.3	16	848
Rubble	9.3	24	1,251
Timber	22.6	59	3,051
Rubber	0.4	1	52
Potentially hazardous	1.0	3	131
TOTAL	100.0	259	13,510

The annual composition is an estimate only, as it is extrapolated from weighbridge records for the period 8 August – 18 September 2022.

Figure 5: Composition of All Waste to Class 1 Landfill



4.2.2 Composition of Kerbside Waste

4.2.2.1 Composition of Council-collected kerbside rubbish

The composition of kerbside waste collected in the council collection was also surveyed, and these surveys were split between the different containers i.e. bags, small, and medium wheelie bins.

The table below shows the relatively weights of materials in each container (in kg). As many households put out more than one rubbish bag per week, the weights per bag and per household are shown (the average number of bags set out by a household each week is 1.35).

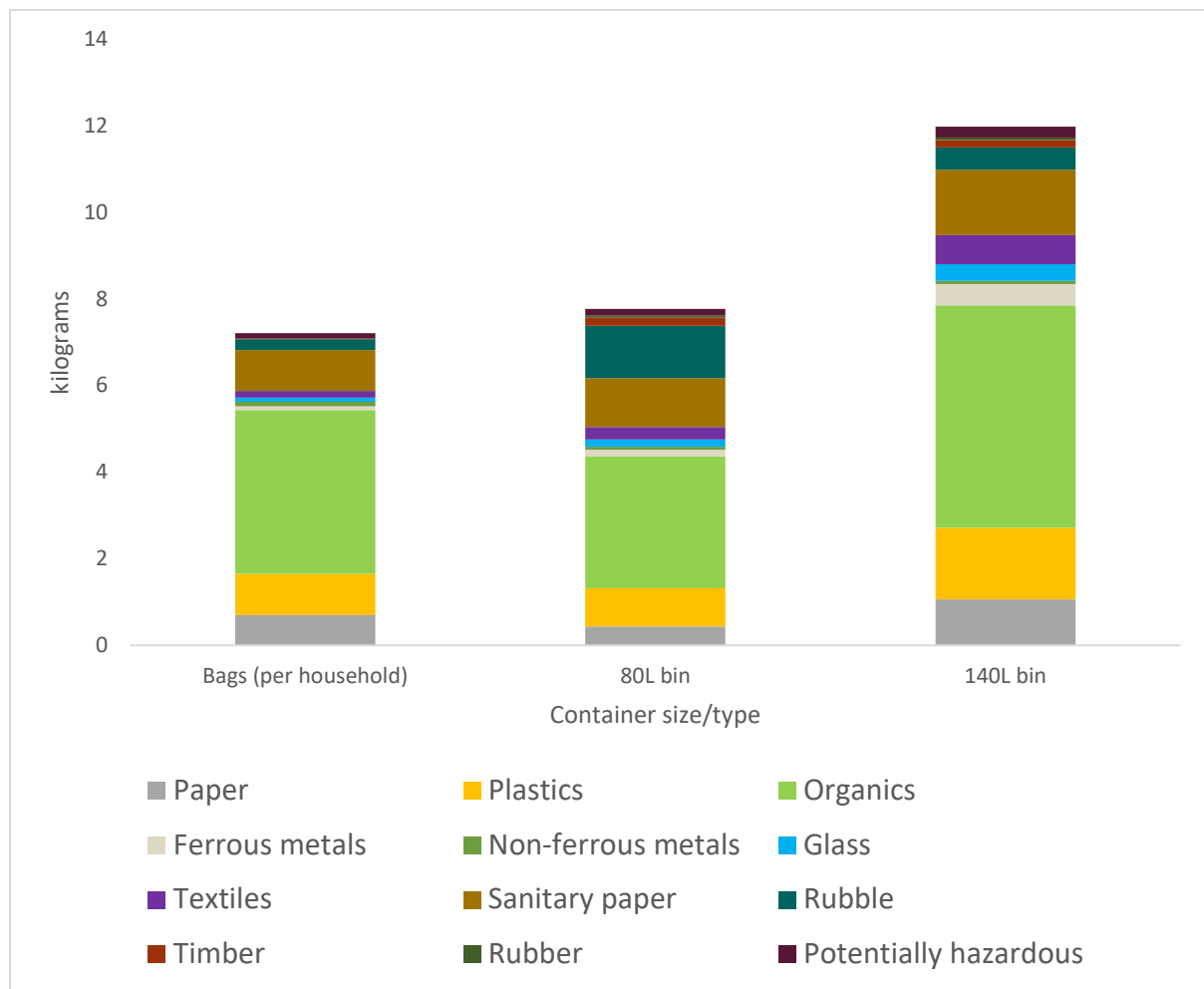
Table 5: Composition of residual waste containers (by weight, kg)

Material type	Bags (per bag)	Bags (per household)	80L bin	140L bin
Paper	0.51	0.70	0.43	1.06

Plastics	0.70	0.95	0.89	1.65
Organics	2.79	3.78	3.04	5.14
Ferrous metals	0.07	0.09	0.16	0.49
Non-ferrous metals	0.07	0.10	0.06	0.08
Glass	0.07	0.10	0.17	0.38
Textiles	0.11	0.15	0.29	0.67
Sanitary paper	0.70	0.95	1.13	1.51
Rubble	0.18	0.25	1.21	0.52
Timber	0.01	0.01	0.19	0.17
Rubber	0.00	0.00	0.04	0.06
Potentially hazardous	0.10	0.13	0.16	0.25
TOTAL	5.32	7.19	7.77	11.97

The figure below shows the weights on a per household basis for each container type/size.

Figure 6: Material weights in kerbside rubbish (per household)

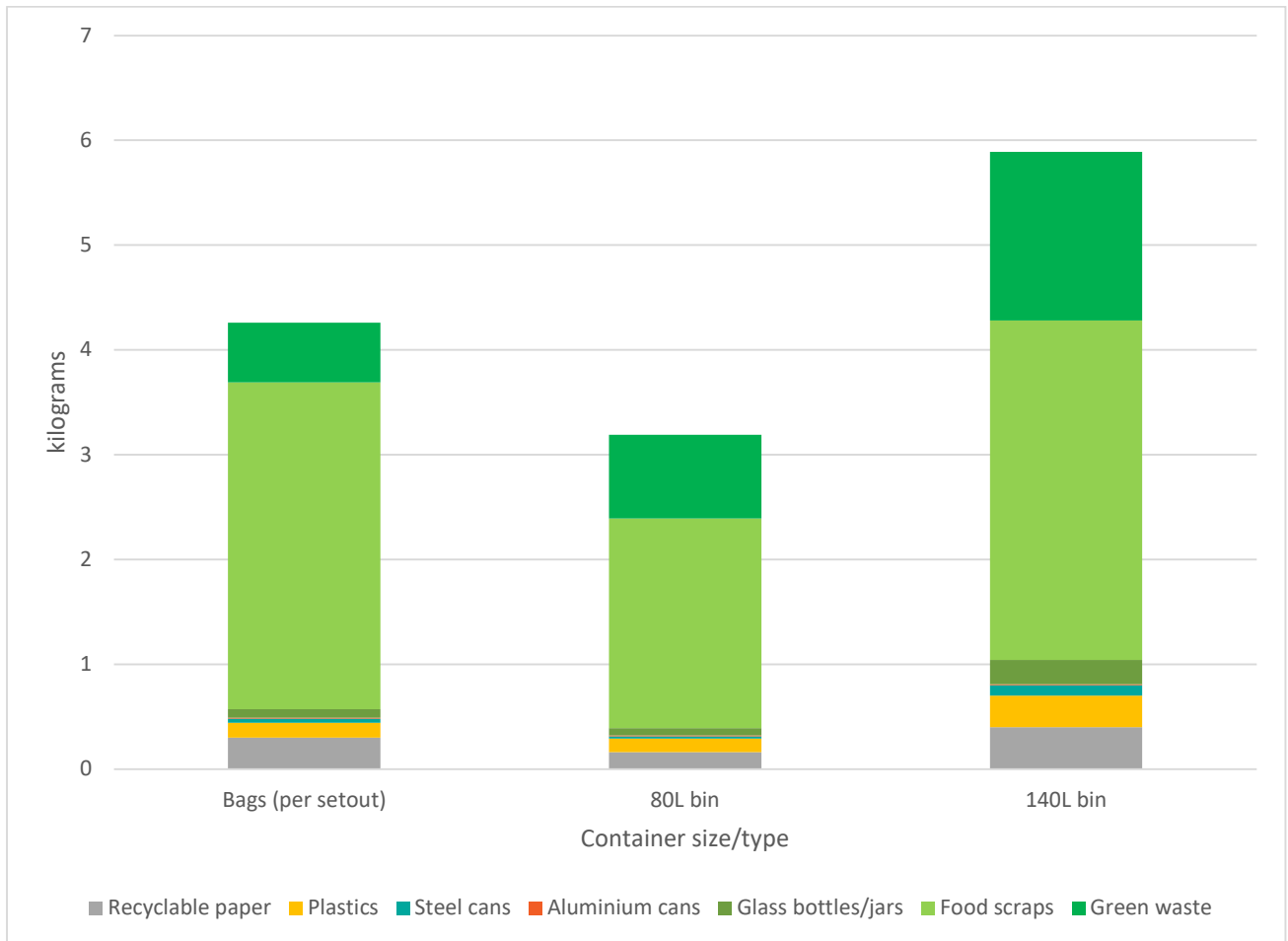


These categories can be broken down further to show potentially divertible material.

Material type	Bags (per setout)	80L bin	140L bin
Recyclable paper	4.1%, 0.30kg	2.0%, 0.16kg	3.3%, 0.40kg
Plastics	1.9%, 0.14kg	1.7%, 0.13kg	2.5%, 0.30kg
Steel cans	0.6%, 0.04	0.3%, 0.02kg	0.8%, 0.10kg
Aluminium cans	0.2%, 0.01kg	0.1%, 0.01kg	0.1%, 0.01kg
Glass bottles/jars	1.1%, 0.08kg	0.9%, 0.07kg	1.9%, 0.23kg
Food scraps	43.4%, 3.12kg	25.7%, 2.00kg	27.1%, 3.24kg
Green waste	8.0%, 0.57kg	10.3%, 0.80kg	13.4%, 1.61kg
Total	59.3%, 4.27kg	40.9%, 3.18kg	49.1%, 5.87kg

The figure below shows the different containers in comparison.

Figure 7: Potentially divertible material weights in kerbside rubbish (per household)



This shows that those using bags or 80L bins are similar in their waste diversion habits, although households using bags tend to throw out more food scraps and households using bins tend to throw out slightly more garden waste. A 140L bin, however, has more of all materials, especially food scraps and garden waste.

4.2.2.2 Composition of all kerbside waste

Council’s kerbside rubbish collections accounts for around 80% of all household kerbside waste disposed of to landfill through the Southbrook RTS.

Surveying kerbside waste at the RTS enables comparisons to be made of the council-collected kerbside waste and privately-collected kerbside waste. This is shown below in Table 6.

Insufficient large (privately-collected) wheelie bins were located during the survey to provide reliable figures, and so data from the 2017 audit was used. It is worth noting that the four private collector bins that were weighed in this survey contained 74% greenwaste by weight.

Table 6: Comparison of Composition - Private vs Council Rubbish Collection

Kerbside rubbish disposed of at Southbrook RTS – August, September 2022	Privately-collected kerbside rubbish		Council kerbside rubbish collection	
	Percentage of total (%)	Tonnes per week	Percentage of total (%)	Tonnes per week
Paper	7.1	2	8.3	8
Plastics	8.0	2	13.3	12
Organics	56.9	13	43.1	40
Ferrous metals	1.9	0	3.4	3
Non-ferrous metals	0.7	0	0.7	1
Glass	7.9	2	2.8	3
Textiles	1.5	0	4.9	5
Sanitary paper	4.0	1	13.0	12
Rubble	3.7	1	6.4	6
Timber	6.1	1	1.5	1
Rubber	0.1	0	0.4	0
Potentially hazardous	2.2	0	2.1	2
TOTAL	100.0	23	100.0	94

The most notable variance here is in organics, with private-collected kerbside rubbish containing 56.9% compared to 43.1% in council containers. Private-collected kerbside rubbish also tends to contain less recyclables overall, with the exception of glass which is much higher (7.9% compared to 2.8%).

The table below shows the quantity of potentially divertible material in the overall kerbside-collected waste stream.

Table 7: Diversion Potential of Kerbside Waste

All kerbside-collected rubbish – August/September 2022	Percentage of total (%)	Tonnes per week (T)
Material recyclable through kerbside collections		

Paper	3.1	4
Plastics (#1, #2, and #5 containers)	2.2	3
Steel cans	0.6	1
Aluminium cans	0.1	0
Glass bottles/jars	1.6	2
Subtotal	7.6	9
Compostable materials		
Food scraps	25.6	30
Garden waste	19.6	23
Subtotal	45.2	53
TOTAL	52.8	61

Around half of the material collected through kerbside collections could have been recycled through existing services or composted.

4.3 Kerbside Organics Material Composition

The material collected in the Council kerbside organics collection was also audited at the time. This is one of the first detailed audits of a mixed organics collection (food and garden organics, or FOGO) in New Zealand.

The material was divided into ‘acceptable’ material types (those that are formally accepted in the service) and ‘unacceptable’ materials which may be non-compostable (such as plastic, and non-compostable garden waste) or are unwanted for other reasons (compostable packaging, timber, soil).

The results of the survey are shown below, for each size of organics collection container.

Table 8: Composition of FOGO Collection Containers

Material type – percentage of total (%)	80L wheeled bins	140L wheeled bins	240L wheeled bins
Compostable garden waste	69.1	74.6	79.3
Food scraps	15.7	10.0	7.8
Compostable paper	0.9	0.5	0.9
Subtotal	86.0	85.0	88.0

Non-compostable garden waste	3.9	0.0	2.3
Compostable packaging	0.0	0.0	0.0
Timber	0.0	0.0	0.0
Soil	7.5	10.9	7.0
Plastic	0.3	0.1	0.2
Other	2.7	3.9	2.5
Subtotal	14.4	14.9	12.0
TOTAL	100	100	100

Soil was categorised as ‘contamination’, and was the most common contaminant in all three sizes of bin.

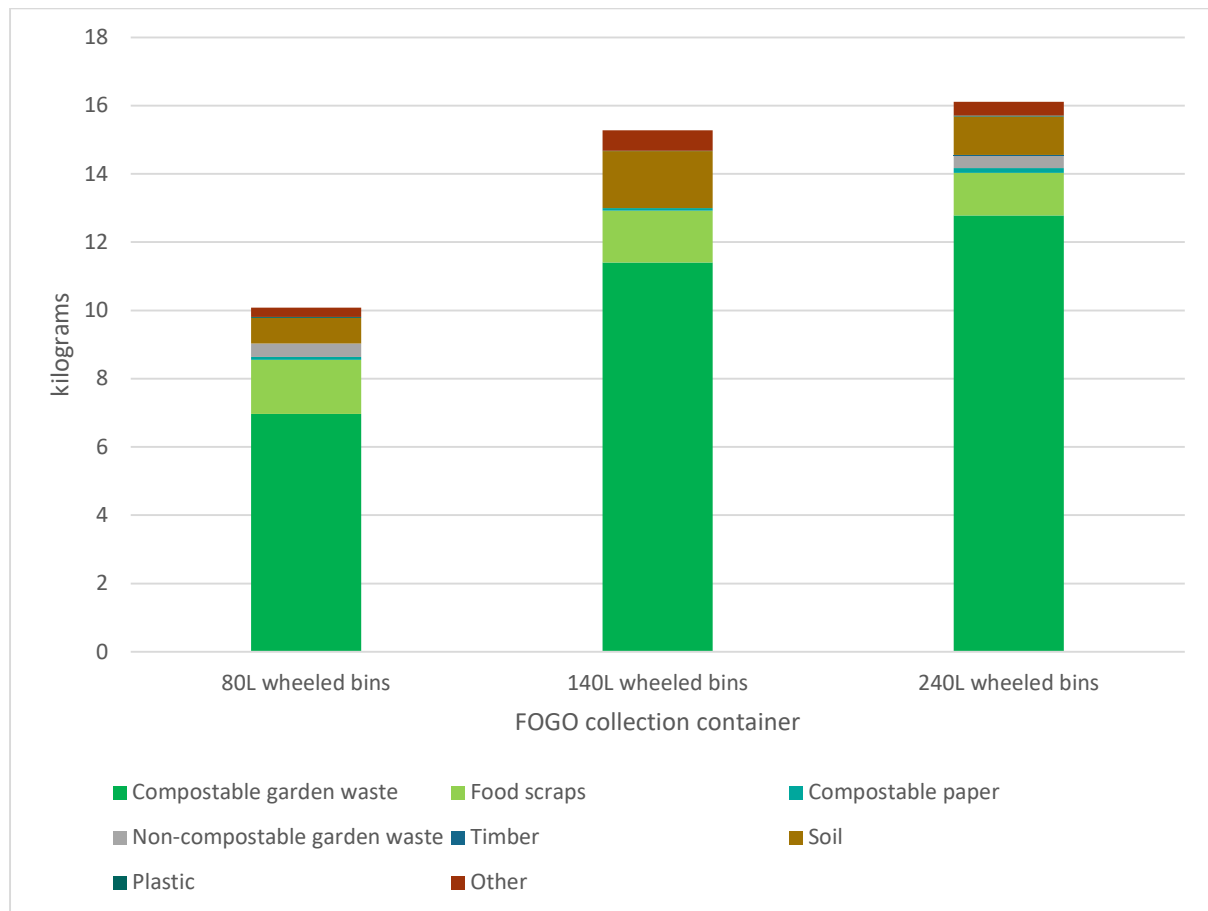
The table below shows the same data, by weight rather than proportion.

Table 9: Composition of FOGO Collection Containers (by weight)

Material type – weight (kg)	80L wheeled bins	140L wheeled bins	240L wheeled bins
Compostable garden waste	6.97	11.40	12.78
Food scraps	1.58	1.52	1.25
Compostable paper	0.09	0.08	0.14
Subtotal	8.64	13.00	14.18
Non-compostable garden waste	0.39	0.00	0.38
Compostable packaging	0.00	0.00	0.0
Timber	0.00	0.00	0.01
Soil	0.75	1.67	1.12
Plastic	0.03	0.01	0.03
Other	0.27	0.60	0.40
Subtotal	1.44	2.28	1.94
TOTAL	10.08	13.00	14.18

The figure below compares the three containers (material types with very small weights are not visible).

Figure 8: Composition of FOGO Collection Containers (by weight)



It is apparent from this figure that soil (categorised as unwanted contamination) is around the same weight as food scraps, a targeted material.

However, contamination overall is reasonably low, at around 13%; compared to contamination rates often experienced in comingled recycling collection containers; and soil makes up the majority of this 'contamination' at 7% to 11%. It is likely that many users of the service consider 'soil' to be a type of garden or organic waste, and therefore this is largely to be an issue for communication and education.

4.4 Overall Diversion Potential

Various materials are diverted from landfill in Waimakariri through recycling, reuse, and recovery. Services available include Council's kerbside recycling collection, recycling drop-off points, and the two RTS.

As well as the various drop-off options, greenwaste and food scraps can also be composted at home, or collected in a private green waste collection service.

Table 10 below shows the proportion of the general waste currently disposed of to landfill that could potentially be diverted using existing systems and available options. The table also shows the tonnes per week of each material that could have been diverted. The data on the individual materials has been taken from the Waste Not Consulting SWAP surveys.

Table 10: Diversion Potential of Waimakariri’s Landfill Waste Stream – 2022

Southbrook transfer station - Divertable materials - By activity source - 8 August - 18 September 2022	C&D	ICI	Landscaping & earthworks	Residential	Council kerbside rubbish	Private kerbside rubbish
	Tonnes per week					
Paper - Recyclable	0.0	0.4	0.0	1.5	2.6	0.6
Paper - Cardboard	1.1	2.3	0.0	2.4	0.3	0.1
Plastic - Recyclable	0.0	0.1	0.0	0.2	2.1	0.4
Food waste	0.0	0.7	0.1	5.1	26.4	3.4
Compostable greenwaste	0.1	0.5	2.4	1.8	10.4	10.1
Ferrous metals	0.5	1.1	0.1	3.8	3.2	0.3
Non-ferrous metals	0.1	0.1	0.0	0.3	0.7	0.1
Glass - Recyclable	0.0	0.2	0.0	0.4	1.5	0.4
Textiles - Clothing	0.0	1.3	0.0	1.0	2.3	0.2
Rubble - Cleanfill	1.1	0.1	0.2	0.1	0.0	0.0
New plasterboard	6.2	0.0	0.0	0.0	0.0	0.0
Timber - Reusable	2.0	0.3	0.0	0.1	0.0	0.0
Timber - Untreated/unpainted	2.0	1.7	0.2	1.1	0.0	0.0
TOTAL	13.1	8.8	3.1	17.7	49.7	15.5

4.5 Comparison with Previous Surveys

The data from Waste Not’s SWAP audit demonstrates that there has been an impact from the recent service changes.

Table 11: Comparison of Composition Over Time

Comparison of overall waste composition – 2010, 2012, 2017, 2020, and 2022	Waimakariri District 2010	Waimakariri District 2012	Waimakariri District 2017	Waimakariri District 2020	Southbrook transfer station 2022
Paper	8.8%	7.4%	6.5%	9.7%	6.8%
Plastics	9.4%	9.6%	10.6%	11.2%	10.4%
<i>Food waste</i>	19.9%	12.5%	13.7%	14.7%	13.9%
<i>Greenwaste & other organics</i>	21.5%	23.5%	23.5%	15.7%	14.3%
Organics - subtotal	41.4%	36.0%	37.2%	30.4%	28.2%

Ferrous metals	2.1%	2.7%	2.9%	2.6%	3.5%
Non-ferrous metals	0.4%	0.5%	0.5%	0.6%	0.5%
Glass	2.4%	1.2%	2.2%	4.3%	2.5%
Textiles	4.7%	7.6%	6.0%	7.0%	8.7%
Sanitary paper	5.3%	4.0%	5.4%	6.3%	6.3%
Rubble	10.1%	11.8%	9.3%	9.5%	9.3%
Timber	14.5%	18.3%	18.0%	17.3%	22.6%
Rubber	0.1%	0.2%	0.7%	0.4%	0.4%
Potentially hazardous	0.7%	0.6%	0.7%	0.9%	1.0%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%
Tonnes per annum to landfill	15,770 T/annum	15,121 T/annum	17,201 T/annum	18,827 T/annum	13,510 T/annum

A few things to note:

- 1) The impact of Council's new organics services, and associated changes, can be seen in the reduction of green waste in 2020 and 2022. There has been no measurable decrease in food waste.
- 2) More recyclable material (glass, paper, plastics) were sent to landfill in 2020 due to disposal of contaminated recycling.
- 3) The overall tonnage has decreased in 2022 primarily due to the presence of the private transfer station.

To elaborate on the last point; the opening of the new private RTS in the district appears to have diverted around 44 tonnes per week from Council's Southbrook RTS. The majority of this is made up of compactor and gantry trucks. An assumed 70% recovery rate from the gantry truck waste would result in an overall quantity of around 33 tonnes per week going to Kate Valley landfill from the RRR RTS.

5 Performance Measurement

5.1 Current Performance Measurement

This section provides comparisons of several waste metrics between Waimakariri and other territorial authorities. The data from the other districts has been taken from a variety of research projects undertaken by Waste Not and Eunomia.

5.1.1 Per Capita Waste to Class 1 Landfills

The total quantity of waste disposed of at Class 1 landfills in a given area is related to a number of factors, including:

- the size and levels of affluence of the population
- the extent and nature of waste collection and disposal activities and services
- the extent and nature of resource recovery activities and services
- the level and types of economic activity
- the relationship between the costs of landfill disposal and the value of recovered materials
- the availability and cost of disposal alternatives, such as Class 2-5 fills
- seasonal fluctuations in population (including tourism).

By combining Statistics NZ population estimates and the Class 1 landfill waste data in section 4.1.1, the per capita per annum waste to landfill in 2022/23 from Waimakariri can be calculated as in Table 12 below. The estimate includes special wastes but excludes non-levied cleanfill materials.

Table 12: Waste Disposal per Capita

Calculation of per capita waste to Class 1 landfills	
Population (2022)	67,900
Total waste to Class 1 landfill	17,394
Tonnes/capita/annum of waste to Class 1 landfills 2020	0.256

This figure varies significantly throughout New Zealand. The table below compares the 2022 figure for Waimakariri with other local authorities, and with the result for Waimakariri from Waste Not's previous surveys.

Table 13: Comparative Per Capita Disposal Rates²⁶

Overall waste to Class 1 landfills including special wastes	Kg per capita per annum
<i>Waimakariri District 2022</i>	256
<i>Waimakariri District 2020</i>	291
Gisborne District 2017	296
<i>Waimakariri District 2012</i>	311
<i>Waimakariri District 2017</i>	325
<i>Waimakariri District 2010</i>	336
Ashburton District 2021	384
Invercargill City 2018	528
Palmerston North 2017	545
Kapiti Coast District 2017	546
Dunedin City 2018	554
Tauranga and Western Bay 2020	560
Napier/Hastings 2022	595
New Zealand (2021)	685
Taupō District 2022	716
Hamilton City 2017	718
Queenstown Lakes District 2020	833
Auckland region 2016	1,053

Areas with lower per capita waste generation tend to be rural areas, or urban areas with relatively low levels of manufacturing activity. The areas with the highest per capita waste generation are those with significant primary manufacturing activity and/or with large numbers of tourists.

Waimakariri has a consistently low rate of waste disposal to landfill. The accuracy of these estimates relies greatly on how accurately the non-Council-controlled waste quantities have been estimated.

Table 14: Waste Disposal per Capita

Calculation of per capita waste in kerbside collections	
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²⁶ Estimate provided by Waste Not Consulting based on a number of datasets held

Population (2022)	67,900
Total kerbside waste	7,684
Tonnes/capita/annum of kerbside waste	113

Table 15: Kerbside-Collected Rubbish per capita

District and year of survey	Kg/capita/annum	Kerbside rubbish services used
Christchurch City 2011	110	Rates-funded fortnightly 140-litre wheelie bins (with weekly organic)
Waimakariri District 2022	113	User-pays rubbish bags + Council wheelie bins + private wheelie bins (with weekly organic)
Waimakariri District 2020	113	User-pays rubbish bags + Council wheelie bins + private wheelie bins (with weekly organic)
Waimakariri District 2016/17	147	User-pays rubbish bags + private wheelie bins
Whangarei District 2017	153	User-pays rubbish bags + private wheelie bins
Auckland Council 2016	156	User-pays rubbish bags + rates-funded wheelie bin + private wheelie bins
Taupo District 2022	183	User-pays rubbish bags + private wheelie bins
Tauranga/WBOP 2019	192	User-pays rubbish bags + private wheelie bins
Hastings District/Napier City 2022	197	Rates-funded 120-litre wheelie bins + private wheelie bins
Hamilton City 2017	197	Rates-funded bags (2 per h/h max)
Palmerston North 2022	215	User-pays rubbish bags + private wheelie bins

The per capita disposal rate of kerbside rubbish from Waimakariri District in 2022 is the same as that estimated in the 2020 survey. The disposal rate decreased 23% between 2016/17 and 2022. This decrease in the disposal rate is associated with Council offering a user-pays organic collection and a Council rubbish wheelie bin service. The three lowest disposal rates shown are from areas where a kerbside organics collection is available.

5.1.2 Performance of Food Waste Capture

With the composition of the organic material collected in the FOGO bins known, it is possible to calculate how well the service is performing in diverting food scraps from rubbish bins.

Key figures used include:

- 1) Food scraps in kerbside organics collection – 10 tonnes per week
- 2) Food scraps in kerbside waste through Southbrook and RRR RTS – 34 tonnes per week
- 3) Total food scraps in kerbside collections – 44 tonnes per week
- 4) Food scraps capture as a percentage of total food scraps – 22.4%

Another useful benchmark is to compare the amount of food waste collected in Council's FOGO collections with other councils, which mostly have a food waste-only collection.

There are two key figures to consider; firstly the amount of food waste in each FOGO container (1.25kg to 1.58kg; an average of 9.9 tonnes per week), and the amount collected **per household served**. In Waimakariri, this latter figure is essentially the number of subscribers to the service; in 2022, 12,203.

Table 16: Food Scraps Collected Per Household Served Per Week

Council	Food scraps collected (per week per household served)
Waimakariri District Council	0.82
Council A (urban/suburban mix)	0.67
Council B (urban)	0.71
Council C (urban)	1.19

The three comparison councils have a range of other services in place, shown below (all have a weekly food scraps-only collection from 23L kerbside bins):

Council	Rubbish	Recycling	Greenwaste
Council A	Weekly user-pays collection from a 140L wheeled bin using pre-paid tags	Fortnightly collection of comingled recyclables from a 240L wheeled bin, and glass from a crate	No council service
Council B	Fortnightly rates-funded collection from a 140L wheeled bin (other sizes possible)	As above	User-pays fortnightly or 4-weekly collection from a 240L wheeled bin

Council C	Fortnightly rates-funded collection from a 120L wheeled bin	As above	No council service
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It is also useful to understand what impact the FOGO collection has had on the composition of residual waste – i.e. how much of the captured food scraps was previously being sent to landfill through the kerbside rubbish collection.

In the 2017 audit, the quantity of food scraps collected in kerbside rubbish going to landfill was around 38 tonnes per week. The 2022 audit estimated that this has reduced to 34 tonnes per week, over a period when the population of the district grew by 17% - so the 38 tonnes in 2017 might have been expected to increase proportionally to around 44.5 tonnes per week. The balance between these two is roughly 10 tonnes, which is the quantity of food scraps currently collected in the FOGO collection. Therefore, it is reasonable to assume that all of the food scraps now collected through the FOGO service was previously going to landfill.

5.1.3 Performance of Garden Waste Capture

With the composition of the organic material collected in the FOGO bins known, it is also possible to calculate how well the service is performing in diverting garden waste from rubbish bins.

Key figures used include:

- 1) Garden waste in kerbside organics collection – 70 tonnes per week
- 2) Garden waste in kerbside waste through Southbrook and RRR RTS – 35 tonnes per week
- 3) Total garden waste in kerbside collections – 106 tonnes per week
- 4) Garden waste capture as a percentage of total garden waste – 66.4%

It is also possible to complete a similar analysis for the impact of the FOGO service, as done for food scraps above. In the case of garden waste, there has been a reduction in garden waste collected in kerbside rubbish collections from 52 tonnes (60 tonnes adjusted for population) to 35 tonnes per week in 2022.

However, there has also been a significant **increase** in the overall quantity of garden waste in the kerbside-collected stream – 52 tonnes per week in 2017 (adjusted for population growth to 2022, 60 tonnes) compared to 106 tonnes in 2022; an increase of between 54 to 46 tonnes.

Some of this material may have been previously diverted through the Southbrook RTS; the remainder will have been managed in other ways such as home composting. The quantities of greenwaste collected at Southbrook RTS have decreased, as shown below:

Table 17: Tonnes of greenwaste diverted at Southbrook RRP

Year	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Tonnes to SRRP	1,241	1,574	1,737	2,224	1,417	1,541	1,580

Tonnes change		333	163	487	-807	124	39
% change		27%	10%	28%	-36%	9%	3%

A significant decrease was noted in the 2019/20 financial year; the same year the FOGO service was introduced. This suggests that a large proportion of the greenwaste now collected at the kerbside has been diverted from the Southbrook RRP; along with a reduction of around 25 tonnes per week that was previously going to landfill through kerbside rubbish collections.

5.2 Compliance with MfE Requirements

MfE have introduced a number of requirements that TAs will be required to comply with or meet. These include kerbside standardisation requirements, with a specified range of materials able to be collected in kerbside recycling and organics collections, and diversion targets for kerbside collections.

Waimakariri is already largely compliant with the requirements of kerbside standardisation, with the exception of needing to remove aerosol cans from kerbside recycling, and paper/cardboard items (such as pizza boxes) from the FOGO collection.

MfE's diversion targets are 30% by 1 July 2026, 40% by 1 July 2028, and 50% by 1 July 2030. Waimakariri's current diversion rate (calculated on council data alone) is currently almost at the 1 July 2030 target of 50%.

Table 18: Kerbside Collection Diversion, 2021/22 Financial Year, Council Only

Waste stream	Quantity (2021/22 financial year, tonnes)	Percentage of total
Kerbside rubbish	4,648.1	50.8%
Kerbside recycling	3,841.3	42.0%
Kerbside food scraps (10.1% on average of total FOGO collection)	666.9	7.2%
TOTAL	9,156.2	100.0%

However, MfE's diversion calculations will include privately-collected kerbside rubbish also. While it is not known how much (if any) kerbside waste is diverted through private collections, the quantity of privately-collected kerbside waste is known. Including this quantity changes the kerbside diversion performance as shown below, meaning that the district is reaching the 1 July 2028 target of 40%, but is further off the 1 July 2030 target of 50%.

Table 19: Kerbside Collection Diversion, 2021/22 Financial Year, Including Private Kerbside Waste

Waste stream	Quantity (2021/22 financial year, tonnes)	Percentage of total
Kerbside rubbish	5,844.1	56.4%
Kerbside recycling	3,841.3	37.1%
Kerbside food scraps (10.1% on average of total FOGO collection)	666.9	6.4%
TOTAL	10,352.2	100.0%

These calculations may not be accurate as the privately-collected kerbside waste may include some non-household waste; and it is not known if any privately-collected kerbside waste is diverted. However, it is clear that, to meet the 2030 target of 50% diversion, the district needs to either make better use of the kerbside recycling and FOGO service (which is absolutely possible, given the quantities of divertible materials still in the rubbish stream) and/or regulate the private market to ensure that more diversion occurs through these services.

6 Review of the 2018 Waste Management and Minimisation Plan

As required by the WMA, Council has carried out a review of their last WMMP, which was adopted in July 2018. This followed a Waste Assessment which was adopted as complete in October 2017, meaning this review and Waste Assessment needs to be adopted as complete by October 2023.

This WMMP had a vision for the future “to value resources and eliminate waste and its harm to the environment”. This vision was supported by two goals, which directly reflected those in the New Zealand Waste Strategy 2002, with further detail in objectives and policies.

Goal	Objectives
G1: Improving the efficiency of resource use	<p>O1: Our community has opportunities for avoiding or reducing waste at source.</p> <p>O2: The Council works with other councils, central government, industry and other parties to improve product stewardship (i.e. aiming to reduce the environmental impact of the life cycle of products)</p> <p>O3: Our community has opportunity to maximise the diversion of material for reuse, recycling or recovery</p> <p>O4: The range of diverted material will be improved and the quality of these materials enhanced</p>
G2: Reducing the Harmful Effects of Waste	<p>O5: Our community has access to services for efficient and effective management of waste that comply with current environmental and health practices</p> <p>O6: The disposal of sewage treatment residuals complies with current environmental and health practices</p> <p>O7: Our community is informed and educated regarding issues regarding hazardous waste and residual waste</p>

The 2018 WMMP targets reflected the adoption of the ‘advanced option’ for improved services and waste minimisation, and were to:

1. reduce annual per capita waste to landfill from 294 kg per capita in 2015/16 to 236kg per capita over a ten year period; and
2. increase the annual per capita quantity of materials diverted from 170kg per capita in 2015/16 to 228 kg per capita over a ten year period.

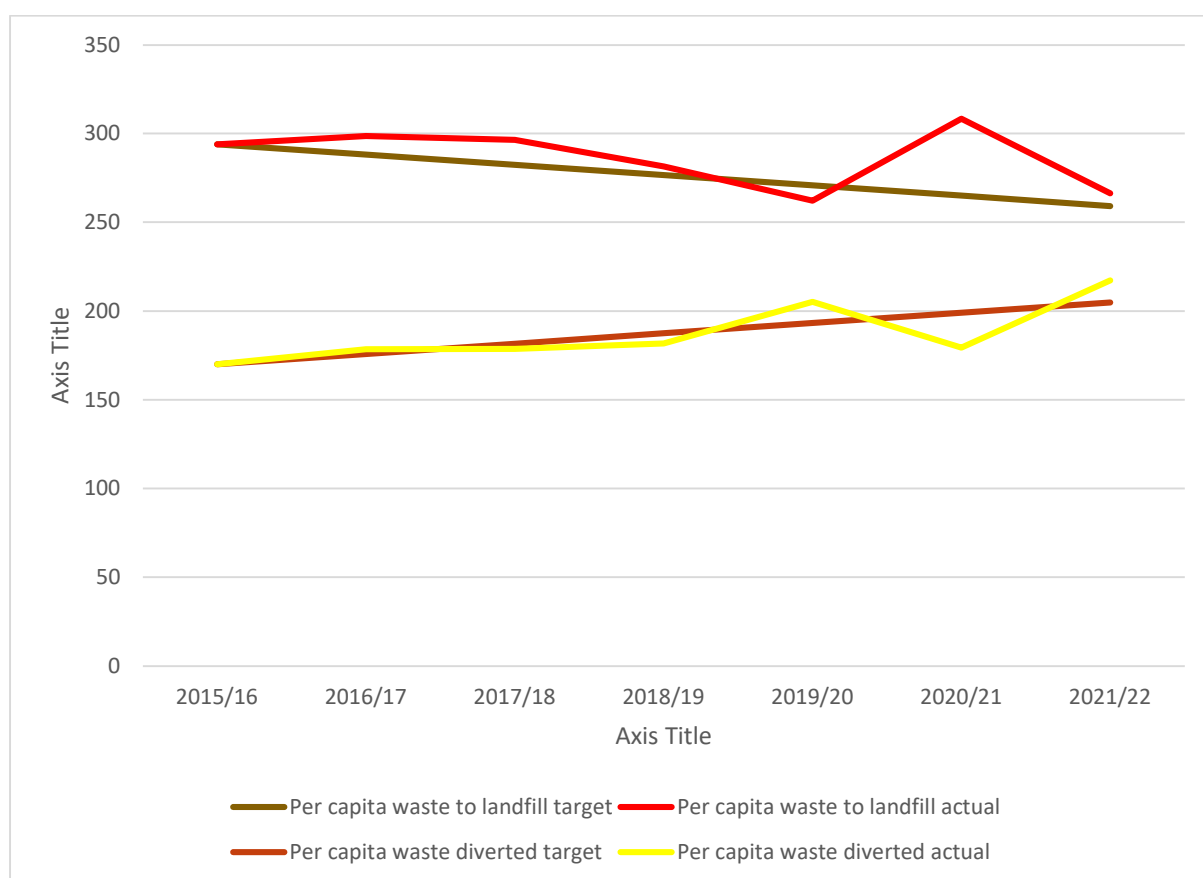
The targets are simple, easy for the public to understand, and reflect both disposal and diversion. Ongoing monitoring and reporting is undertaken to track progress against the targets.

Table 20: 2018 WMMP Targets and Baseline

Year	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
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Per capita waste to landfill	Target	294kg (baseline)	288.2kg	282.4kg	276.6kg	270.8kg	265.0kg	259.2kg
	Actual		298.6kg	296.4kg	281.4kg	262.2kg	308.4kg	266.3kg
Per capita waste diverted	Target	170kg (baseline)	175.8kg	181.6kg	187.4kg	193.2kg	199kg	204.8kg
	Actual		178.5kg	178.6kg	181.7kg	205.1kg	179.4kg	217.4kg

Figure 9: Progress Towards 2018 WMMP Targets



The figure above shows that, up until 2020/21 financial year, good progress was being made towards meeting or even exceeding the targets. However, performance was then affected by significant disruptions to services as a result of COVID-19 pandemic management (such as cancelled collections, and short-term issues with unusually high levels of contamination in recycling and organics collections). The 2021/22 year has shown an impressive rebound in performance to meet or exceed the targets again.

The nature of waste services and infrastructure means that progress towards a target is rarely linear; instead, improvements tend to be visible as leaps in performance with a period of stagnation until the next improvement is implemented.

The issues identified for waste management and minimisation in the district were:

- a high volume of domestic divertible material is going to landfill;

- the need to meet the differing needs of rural and urban households and businesses;
- lack of capacity at Southbrook Resource Recovery Park;
- inappropriate farm waste/rural disposal practices resulting in damage to the environment;
- a high volume and increasing proportion of construction and demolition waste going to landfill; and
- the inappropriate disposal of e-waste and hazardous waste.

More detail on the issues and a high-level assessment of all options to address the issues was included in the Waste Assessment.

In particular, Council considered a range of options for amending the kerbside collection services offered, to address the issues in all or part. Two preferred options were identified ('enhanced' or 'advanced'), and public consultation was carried out. Of the two preferred options, the 'advanced' option was taken forward to the WMMP action plan.

The table below comments on the vision, goals, objectives, and target.

2018 Plan	Commentary
Vision	<p>The previous vision reflected some zero waste principles and te ao Māori, in treating 'waste' as a valuable resource, and was very reflective of the New Zealand Waste Strategy at the time.</p> <p>Recent years have seen a global focus on the concept of a 'circular economy' which incorporates many zero waste principles, and raises the importance of 'circularity' in waste systems. There is also a growing awareness of the environmental impacts (especially GHG emissions) of waste management practices.</p> <p>The recently released Te rautaki para Waste Strategy has a circular economy-based vision, and WMMPs are required to reflect this.</p> <p>For these reasons, it is proposed that a new vision be developed for the next WMMP.</p>
Goals	<p>The goals are heavily reflective of the previous New Zealand Waste Strategy, and these should be revised to reflect Te rautaki para.</p>
Objectives	<p>Similarly, the objectives need reviewing alongside the goals particularly in the context of Te rautaki para. Additional objectives could be included to reflect the wider circular economy approach, focus on emissions and more aligned with the direction of Te rautaki para.</p>
Target	<p>The targets are considered appropriate and fit for purpose.</p>

6.1 Actions

The table below shows the key actions from the previous WMMP, and a brief comment on the extent to which each has been achieved.

Table 21: Review of the Previous WMMP Action Plan (actions with contribution towards targets)

Action	Existing or new action, timeframes	Progress
Community has opportunities for avoiding or reducing waste at source		
Circulate educational information to promote Council’s waste management and minimisation services	Existing, ongoing	The kerbside recycling information brochure was updated in mid-2020 and delivered to all residents within collection areas. Ongoing media adverts were used to inform residents of correct use of recycling and organics bins. Recycling bin audits were carried out in 2020 and 2021, with educational material placed in residents’ letterboxes as necessary, resulting in contamination levels reverting to around 5%. Recycling bin audits are ongoing.
Provide educational programmes and support other programmes aimed at waste management and minimisation and sustainability e.g. boomerang bags and ‘no plastic straw’ campaign	Existing, ongoing	School and community education services are continuing via Eco Educate (EE) and Enviroschools Canterbury. Sustainable Living Education Programme resources are available to residents, and the educator has the ability to facilitate the programme. This year, Council has supported extending waste education at some events, with EE staffing wastes station to divert event waste.
Establish an educational facility for promotion of waste management and minimisation at the Southbrook RRP as part of the planned upgrade of the Southbrook RRP	New, by 2022/23	The education centre is a key component of the site upgrades, which have been delayed. Council is providing access to a bookable facility for use as temporary classroom by the education provider.
Support organisations leading litter clean-up and campaigns at raising awareness of waste minimisation, potentially by means of grants	Existing, ongoing	Funding has been increased in response to larger number of groups carrying out clean-ups, particularly along rivers and in estuaries after flood events.

Collaborate with other councils, to promote waste management and minimisation and waste acceptance criteria in a regionally and nationally consistent way	Existing, ongoing	Council works with other Canterbury Councils via the Canterbury Waste Joint Committee; participates in national Council waste staff meetings and webinars; provides funds for LFHW and the TAO Collaborative Fund which are coordinated by WasteMINZ.
Promote and support existing waste minimisation and resource efficiency initiatives targeting local industry	Existing, ongoing	Information provided on Council website
Council works with other councils, central government, industry and other parties to improve product stewardship		
Advocate to government, possibly via a coordinated approach with other organisations, such as Canterbury Waste Joint Committee, Local Government New Zealand and WasteMINZ	Existing, ongoing	Council participates actively in government consultations, submitting individually, and provides input into WasteMINZ, LGNZ, CWJC and Canterbury Mayoral Forum submissions
Promote and support product stewardship programmes operating in-district	Existing, ongoing	Information provided on Council website
Our community has opportunities to maximise the diversion of material for reuse, recycling or recovery		
Refine and publish Council's policy regarding the extent of kerbside collection service, both the urban/rural boundaries and the residential/commercial extent of services.	New, 2018/19	Bylaw updated in 2019 to reflect new services and collection area expansions
Improve RRP and Transfer Station facilities (Oxford TS and Southbrook RRP) to expand associated services for diverted material.	Existing, ongoing	Taking advantage of new opportunities as well as we can within current site constraints: new battery recycling drop-offs; recycle mobile phones and toner cartridges through product stewardship schemes; implemented PVC pipe recycling and trialling plasterboard diversion.

Upgrade Southbrook RRP and Oxford TS facilities to increase capacity when required.	New, 2018 – 2022	Consultant engaged to assist with concept plans for Southbrook RRP expansion and upgrades; initial high-level advice being sought in relation to Oxford TS levels of service and potential diversion activities.
Optimise the separation of diverted material at the RRP and TS facilities through procurement processes and contractual agreements	New, 2018/19 and ongoing	Council is working with our contractor to undertake more diversion activities; they currently divert larger items from pit and encourage customers to separate loads to reduce landfill.
Use financial incentives to encourage the separation of reusable and recyclable materials from the waste stream.	Existing, ongoing	Continuing to provide free disposal for re-sellable second hand goods and most recyclables; lower charges for green waste, hardfill/rubble.
Investigate the feasibility of providing recycling bins alongside litter bins in the district, and implement where appropriate.	Existing, ongoing	Not progressed: barrier to this is levels of contamination from dirty materials and non-recyclables being placed in recycling bins.
Maintain existing drop-off points for diverted material in beach townships and investigate the feasibility of establishing recycling drop-off points at suitable locations for rural resident use, including trialling new locations.	Existing, ongoing	Recycling drop-offs provided in beach settlements (fixed bins plus larger recycling skips over summer periods); Council supporting availability of recycling at some campgrounds (provision of signage, etc.); Cust is still the only rural recycling facility.
The range of diverted material will be improved and the quality of these materials enhanced		
Continue monitoring the composition of waste going to landfill through SWAP studies and investigate further waste minimisation measures when warranted.	Existing, ongoing	3-yearly SWAP audits undertaken – COVID disrupted the planned 2019/20 audits, and only a visual audit was undertaken at Southbrook RRP, with consultants unable to carry out kerbside bag/bin audits as planned. The full suite of SWAP audits was undertaken in September 2022.
Our community has access to services for effective and efficient management of waste that complies with current environmental and health practices		

Continue to provide litter collection bins at certain locations throughout the district	Existing, ongoing	Provided
Ensure that littering and illegal dumping in public places is managed effectively	Existing, ongoing	Managed by various Council departments (Greenspaces, Drainage, Roding, Environmental Services) depending on where illegal dumping has occurred.
Maintain existing RRP and Transfer Station facilities (Oxford TS and Southbrook RRP) and associated services for waste disposal, including domestic hazardous waste disposal.	Existing, ongoing	COVID disrupted services in 2019/20 with essential waste-only accepted for lock-down periods; otherwise all services available with minor disruptions owing to a few unplanned closures relating to strong winds (partial closures only), fires at the site, asbestos disposed of in scrap metal and pit areas, etc. These closures have been reported quarterly and annually as they are non-financial KPIs.
Ensure all resource consent requirements for Council owned solid waste services, facilities and closed landfills are complied with	Existing, ongoing	Continuing to work toward full compliance
The disposal of sewage treatment residuals complies with current environmental and health practices		
Disposal of screenings from the Council's wastewater treatment plant (WWTP) at Kate Valley landfill and dewatered sewage sludge at Christchurch City Council's Bromley WWTP, or alternative facility or site if feasible.	Existing, ongoing	No changes made. Some WWTP sludge bagged on-site (in biobags) to dewater
Our community is informed and educated about hazardous waste and residual waste		
Carry out educational campaigns to raise awareness about littering, including larger scale illegal dumping, when warranted.	Existing, ongoing	Generate articles and stories via Council website, social media and to newspapers in relation to clean-ups, generally in association with KNZB Clean-up week

Not only has Council completed the majority of the planned actions, in some cases the outcome of the planned action has subsequently been implemented. An example is the implementation of council-contracted kerbside collection services.

Significant progress has been made on other actions, such as public education and engagement, and these will continue to be a core part of solid waste activities for Council.

For these reasons, and due to the changes already implemented and due to be implemented in national policy, regulations and work programmes; it is recommended that Council adopt a new WMMP that reflects these changes, with an appropriate vision and supporting goals and objectives.

7 Future Demand and Gap Analysis

7.1 Future Demand

There are a wide range of factors that are likely to affect future demand for waste minimisation and management. The extent to which these influence demand could vary over time and in different localities. This means that predicting future demand has inherent uncertainties. Key factors are likely to include the following:

- Overall population growth
- Economic activity
- Changes in lifestyle and consumption
- Changes in waste management approaches

In general, the factors that have the greatest influence on potential demand for waste and resource recovery services are population and household growth, construction and demolition activity, economic growth, and changes in the collection service or recovery of materials.

7.1.1 Population

Population projections are shown in the following table:

Table 22: Population Projections to 2048²⁷

Projection	2018	2023	2028	2033	2038	2043	2048	Change 2021 – 2048: number	Change 2018 – 2048: average annual percent
Low		65,000	67,200	68,800	70,000	70,700	70,900	5,900	0.3%
Medium	61,300	66,800	70,800	74,400	77,600	80,500	83,000	16,200	0.8%
High		68,600	74,500	80,200	85,500	90,700	95,500	26,900	1.3%

The district’s estimated population in 2020 was 64,700, and for planning purposes Council uses a population forecast that sits somewhere between the StatsNZ medium and high projections. Building consent numbers continue to be high, and so a population growth forecast on the higher side is considered appropriate. Priority areas for planned growth are Rangiora, Woodend/Pegasus, and Kaiapoi; but significant growth is also expected around Oxford and in rural areas. Commercial growth is largely centred around Southbrook,

²⁷ StatsNZ population forecasts

although Ravenswood in Woodend has land zoned for commercial development and this is being developed in parallel with the residential areas.

The demographics of the district are expected to change as the impacts of an ageing population and the impacts of immigration are felt. With the elderly more likely to live alone, contributing further to a national trend towards smaller households, the average household size is likely to reduce. This may be balanced, to an extent, by increasing quantities of medical waste associated with aged care. There may also be increasing numbers of elderly living in various forms of supported care. Retirement villages and care homes are more likely to manage waste and recycling through private services rather than make use of council kerbside services; and there are a number of these developments planned or underway in the district.

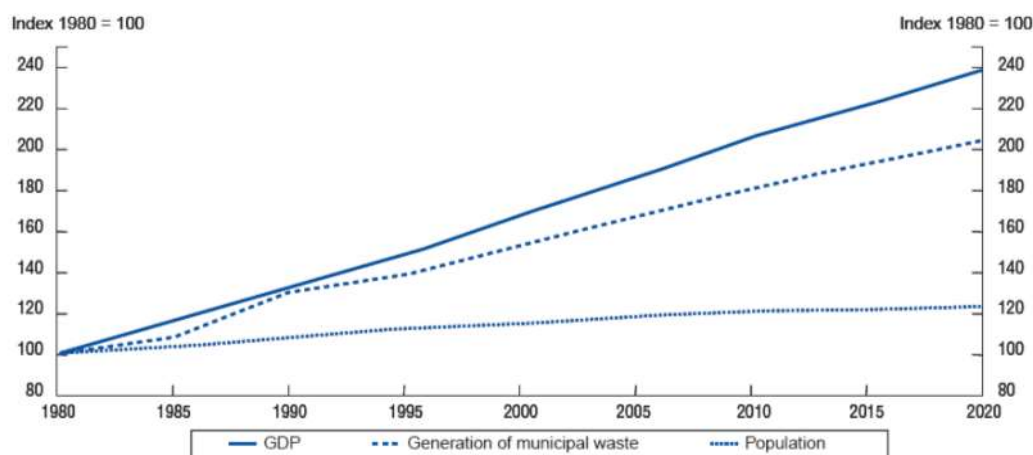
7.1.2 Economic Activity

The Waimakariri district continues to experience strong economic growth; currently the 11th fastest area in the country at 3.7% in the year to March 2023.

GDP has a strong relationship with waste generation, and so this strong growth is likely to result in ongoing increases in consumption and hence waste generation.

For reference, Figure 10 below shows the growth in municipal waste in the OECD plotted against GDP and population.

Figure 10: Municipal Waste Generation, GDP and Population in OECD 1980 - 2020



Source: OECD 2001.

Research from the UK²⁸ and USA²⁹ suggests that underlying the longer-term pattern of household waste growth is an increase in the quantity of materials consumed by the average household and that this in turn is driven by rising levels of household expenditure.

²⁸ Eunomia (2007), *Household Waste Prevention Policy Side Research Programme*, Final Report for Defra, London, England

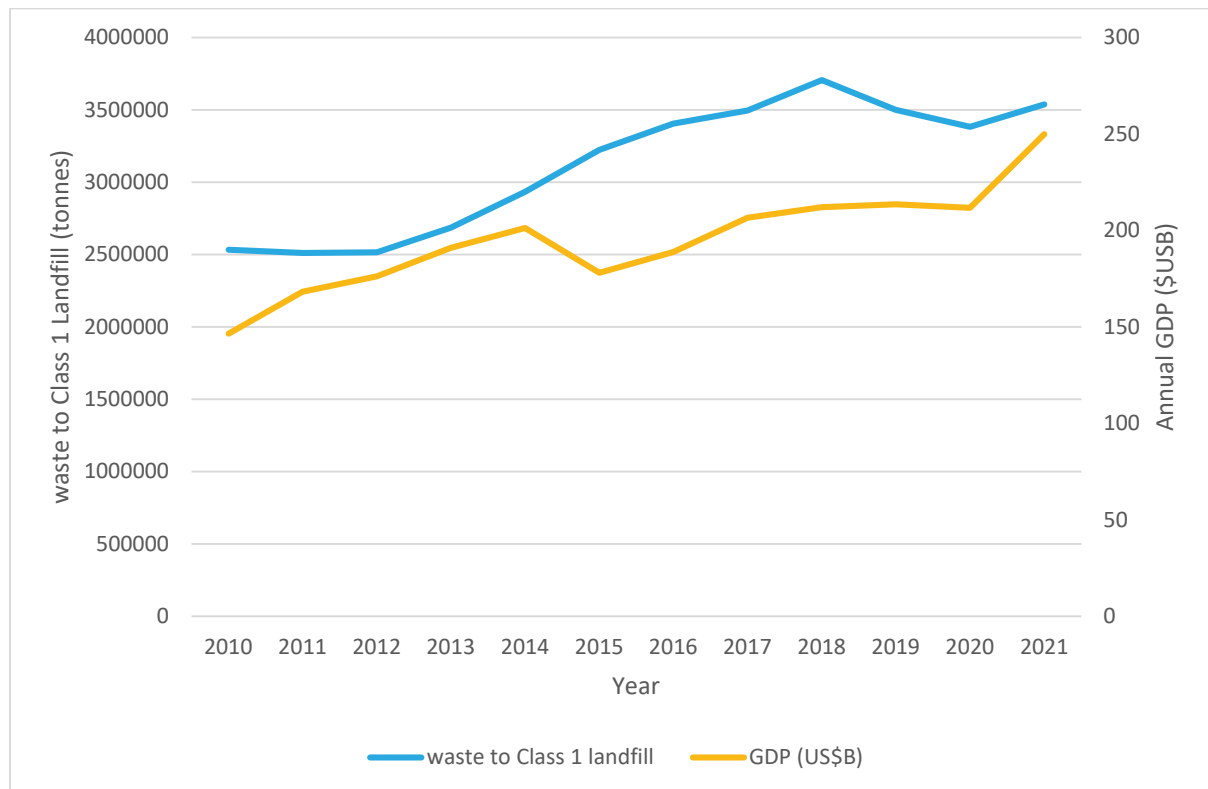
²⁹ EPA, 1999. *National Source Reduction Characterisation Report For Municipal Solid Waste in the United States*

The relationship between population, GDP, and waste seems intuitively sound, as an increased number of people will generate increased quantities of waste and greater economic activity is linked to the production and consumption of goods which, in turn, generates waste.

Total GDP is also a useful measure as it takes account of the effects of population growth as well as changes in economic activity. The chart suggests that municipal solid waste growth tracks above population growth but below GDP. The exact relationship between GDP, population, and waste growth will vary according to local economic, demographic, and social factors.

Figure 11 below shows the annual tonnes sent to Class 1 landfill disposal, against the annual GDP of New Zealand (in billions of US\$). This relationship is not a complete picture, as Class 1 landfills tonnes are a subset of all waste disposed of in New Zealand, and this further does not represent waste produced, but only waste disposed of to Class 1 landfills. This data also can only be shown from 2010, as this was the first time that waste to Class 1 landfill disposal was measured accurately.

Figure 11: Waste to Class 1 Disposal and GDP (2010 - 2021)



As Waimakariri district’s population is anticipated to experience steady growth, alongside economic growth, it is likely that the district will experience an approximately similar increase in waste generated assuming no change to waste behaviour or resource recovery rates.

7.1.3 Changes in Lifestyle and Consumption

Consumption habits affect the waste and recyclables generation rates. For example, there has been a national trend related to the decline in newsprint. In New Zealand, the production of newsprint has been in decline since 2005, when it hit a peak of 377,000

tonnes, falling to 276,000 tonnes in 2011.³⁰ Anecdotally, this has been accompanied by an increase in the use of printed direct mail ('junk mail') both in real terms and proportionally. This presents challenges for fibre recycling as this is a less desirable recycling commodity.

The ongoing growth in electronic devices will ensure that e-waste continues to be a growing waste stream, with (for example) data showing that households now tend to access the internet through multiple devices within the home and out, rather than a single home computer³¹.

7.1.4 Changes in Waste Management Approaches

There are a range of drivers that mean methods and priorities for waste management are likely to continue to evolve, with an increasing emphasis on diversion of waste from landfill and recovery of material value. These drivers include:

- Te rautaki para / New Zealand Waste Strategy – with a strong focus on reducing emissions and waste, to achieve a more circular economy
- New Zealand's first Emissions Reduction Plan with a number of actions for the waste sector including reducing the amount of organic going to landfill, including C&D, and a potential ban or limits on organic waste to landfill; along with improving waste data and landfill gas capture
- Infrastructure investment - an increased landfill levy and other funding sources will drive increased investment in waste infrastructure. MfE are currently working a long-term strategic waste infrastructure investment plan.
- Increased cost of landfill - landfill costs have risen in the past due to higher environmental standards under the RMA, introduction of the Waste Disposal Levy (currently \$50 per tonne for Class 1 disposal facilities) and the New Zealand Emissions Trading Scheme. The current price for carbon credits, and the ongoing increases in the landfill levy, will make disposal prices a more significant consideration in waste management practices.
- Kerbside standardisation now requires that a standard list of materials is collected in kerbside recycling (including glass) and that kerbside food scraps collections are introduced, with associated performance standards for TAs based on kerbside diversion; this will increase existing community demand for kerbside services where they don't already exist.
- Waste industry capabilities - as the nature of the waste sector continues to evolve, the waste industry is changing to reflect a greater emphasis on recovery and is developing models and ways of working that will help enable effective waste minimisation in cost-effective ways. COVID-19 pandemic management presents ongoing challenges in resourcing, both staff and vehicles, and logistics.
- Local policy drivers, including actions and targets in the WMMP, bylaws, and licensing.

³⁰ http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=10833117

³¹ Data from www.stats.govt.nz 'Household Use of Information and Communication Technology' accessed September 2018

- Recycling and recovered materials markets - recovery of materials from the waste stream for recycling and reuse is heavily dependent on the recovered materials having an economic value. This particularly holds true for recovery of materials by the private sector. Markets for recycled commodities are influenced by prevailing economic conditions, by commodity prices for the equivalent virgin materials, and by market controls in key destinations such as China. The risk is linked to the wider global economy through international markets, and the impact of the China National Sword policies has demonstrated this.

7.1.5 Summary of Demand Factors

The analysis of factors driving demand for waste services in the future suggests that demand will increase over time as a result largely of population growth and economic activity. It is likely that some new waste management approaches will be introduced as a result of the central government work programme, which could create demand in specific areas. Initial indications are that, for Waimakariri, this new demand is likely to be largely related to efforts towards possible business food waste diversion and recovery of construction wastes.

There is also likely to be an increasing focus and demand in other waste activities and types, including:

- disaster waste – recent events have highlighted the need for proactive disaster waste management plans, particularly with respect to local resilience where there is reliance on waste infrastructure located elsewhere in the region, or outside the region;
- smaller but difficult waste streams such as soft plastics, packaging that isn't accepted in kerbside recycling collections, compostable packaging as replacements for what will become banned packaging items, farm wastes, vape waste; and
- the impact of a possible future container return scheme.

7.2 Future Demand – Gap Analysis

The aim of waste planning at a territorial authority level is to achieve effective and efficient waste management and minimisation. The following high level 'gaps' or key issues have been identified. These are discussed in more detail in the sections below.

- significant quantities of organic waste going to landfill, which is predominately food waste from household sources; despite the provision of a subscription FOGO service;
- central government requirements for kerbside services such as standardised materials and performance targets;
- improved management of waste from construction and demolition, particularly diversion of new plasterboard and timber;
- rural waste streams are poorly understood and would probably benefit from more proactive management;
- other materials going to landfill such as cardboard, paper, and textiles from both residential and ICI sources;
- reduced influence over waste resulting from the new private RTS;
- increased requirements to monitor waste flows;
- more intensive management required for Class 3/4 fills to meet reporting requirements and encourage better waste management;

- ensuring waste infrastructure accommodates growth in the district; and
- proactive disaster and medical waste management.

7.2.1 Organic Waste Diversion

Despite the introduction of Council's subscription household FOGO service, the results of the SWAP audits show that residents are not using this service well for food scraps; and there are still significant quantities of food scraps and garden waste going to landfill through kerbside collections and (in the case of food scraps) through residential loads taken directly to the Southbrook RRP.

Changing the service to a rates-funded service may increase participation somewhat, but is unlikely to increase the set-out rate and will not have any effect on the quantity of food scraps each household puts out for collection.

Recent research funded by the MfE has analysed a number of practical service and behaviour change approaches that can improve the capture of food scraps and present a number of options Council could try to improve capture and set-out rates.

7.2.2 Construction and Demolition Waste

While some C&D waste is being diverted through Southbrook RRP, many building sites do not lend themselves easily to on-site separation of materials, which can make diversion of construction wastes difficult. Recovering C&D waste from these sites really requires some kind of sorting facility. There are currently significant quantities of clean plasterboard and reusable or untreated timber going to landfill, which could both be diverted to beneficial use if separated from other construction wastes.

7.2.3 Rural waste management

Nationally, rural wastes are estimated to account for up to 12% of waste disposed of.³² Waste streams from rural areas are not well understood, and current management practices of farm wastes probably include a number of less desirable methods such as on-property burning and burial.

Rural wastes are most commonly managed on-farm with material stockpiled, burned, and/or buried. There are very few controls over waste disposal on farm sites, and much of the material which is currently managed informally could be recycled or recovered, or properly disposed of.

The key issue is that current management methods are essentially no-cost and relatively convenient for farmers. Little to no sorting is required; services that collect non-natural materials for recovery or proper disposal are likely to be costly due to the distances involved and remoteness from processing and consolidation points, and require farmers to sort different materials into a number of different containers for collection.

³²Ministry for the Environment. 2019. *Reducing waste: a more effective landfill levy – consultation document*. Wellington: Ministry for the Environment.

Current product stewardship programmes such as Agrecovery and Plasback apply charges to farmers that participate in the schemes.

There have been a number of trials of farm waste collection services nationally. In addition, there are steps being taken to develop regulated product stewardship schemes for farm plastics and agricultural chemicals and their containers, which will provide a more comprehensive approach with (potentially) no direct charges to the end-user at end of life. There may be an opportunity to leverage these initiatives to support on-farm collection services for non-natural rural wastes that offers a high-quality collection service at below cost.

7.2.4 Recyclables

Despite the household kerbside services provided by Council, and the ability to recycle separated material at the Southbrook RRP, there are still quantities of recyclables going to landfill; especially cardboard and paper.

7.2.5 Textiles

Textiles are a material stream that has historically had a very low profile nationally. The recent focus on carbon reduction through waste management has increased this profile as textiles can contribute significantly to carbon impact assessments. Various national programmes exist to divert specific textile types (such as socks and cotton clothing) but these are capturing very small quantities and are unlikely to have the ability to cope with large quantities.

7.2.6 Private Sector Involvement

Non-household collection services are provided by the private sector, along with a proportion of household collection services. A private RTS also recently opened in the district.

Private sector involvement in the waste industry is not uncommon. However, private operators will, unsurprisingly, make service provision and investment decisions based on commercial realities. These decisions may not be in alignment with Council's preferred waste management approach or infrastructure priorities.

This issue will become increasingly important as performance reporting for household kerbside collections will include data reported by private operators. Although this will be reported directly to MfE, it may not necessarily be accessible by the councils in which areas the services are provided.

7.2.7 Monitoring and Performance Targets

Council will be subject to increasing requirements to report data on the use of facilities and services to MfE. This is a particular issue when it comes to the operation of the two 'cleanfills' in the district, as the current operation of these sites makes it difficult to accurately monitor the types and quantities of wastes. Introducing equipment and methodologies to monitor the facilities more accurately is very likely to result in a higher charge for use of the sites. An alternative is to restrict the use of the sites only to waste sources that can be measured in other ways, such as Council contracts for construction and maintenance.

7.2.8 Waste Infrastructure

As growth continues in the district, there will be a need to expand and increase waste infrastructure accordingly to accommodate this growth.

This is a particular issue for the Southbrook RRP, which is currently being expanded to occupy the full space available at the current site. Oxford transfer station also requires improvements and expansions to accommodate the anticipated growth in this part of the district.

The circular economy focus of Te rautaki para | Waste Strategy gives the impetus and mandate to consider waste infrastructure in a slightly different way, with more of an emphasis on encouraging and providing for circular material flows.

7.2.9 Medical Waste

Medical waste can be an issue at home and in medical facilities. Generally, it is comprised of:

- Hazardous waste (which can be sharps, such as needles, or non-sharps such as infectious waste or radioactive);
- Controlled waste (such as potentially infectious bodily fluids); and
- Non-hazardous waste (which is general waste or recyclables).

At home, non-hazardous waste can generally be managed through usual general refuse and recycling services (although there are some exceptions through either the size of the item, or the sheer quantity). However, the management of hazardous and controlled wastes at home can be difficult, and with the increasing prevalence of in-home medical care, this is becoming a more significant problem.

Anecdotally, a significant proportion of in-home medical waste is disposed of through general waste and recycling systems³³. This could result in significant health and safety concerns for the collection and processing staff.

Ideally, in-home medical care would include provision for appropriate handling and disposal of medical wastes. However, for various reasons such as lack of awareness or cost, this is not always the case.

For healthcare in medical facilities, The Pharmacy Practice Handbook states:³⁴

4.1.16 Disposal of Unused, Returned or Expired Medicines

Members of the public should be encouraged to return unused and expired medicines to their local pharmacy for disposal. Medicines, and devices such as diabetic needles and syringes, should not be disposed of as part of normal household refuse because of the potential for misuse and because municipal waste disposal in landfills is not the disposal method of choice for many pharmaceutical types. Handling and disposal

³³ Of 7,145 patients cared for at home by Capital & Coast DHB staff in 2016, only 200 had a specific medical waste collection service in place. <https://www.stuff.co.nz/dominion-post/news/93705822/needles-sanitary-waste-and-pharmaceuticals-putting-waste-workers-at-risk>

³⁴ <https://nzpharmacy.wordpress.com/2009/06/09/disposal-of-unwanted-medicines/>

should comply with the guidelines in NZ Standard 4304:2002 – Management of Healthcare Waste.

While Council is not responsible for the provision of medical waste management services for either home-based care or medical facilities, it would be beneficial for Council to work proactively with Te Whatu Waitaha - Canterbury and other medical service providers to ensure that appropriate services are being offered and put in place; efforts to do so via the CWJC are ongoing.

7.2.9.1 Disaster Waste

Disaster waste is increasingly becoming an issue, as climate change drives more extreme weather events such as flooding and slips, along with other natural disasters (such as earthquakes). A regional approach to this might strengthen a response to events that are likely to have regional scale impact.

8 Statement of Options and Proposals

This section sets out the range of options available to Council to address the key issues that have been identified in the previous section of this Waste Assessment. Options presented in this section would need to be fully researched and the cost implications understood, before being implemented through Council's WMMP action plans and respective LTP/Annual Plan. Addressing these issues will ensure that Council is meeting their statutory obligations, and improving waste management and minimisation in the Waimakariri district.

8.1 Circular Resource Networks

A core principle incorporated in the options table following is that of the 'circular resource network'. This is a concept first developed in work carried out by Eunomia for the Ministry for Environment in 2021, and is included in the recently released 'National Resource Recovery – Infrastructure and Services Stocktake and Gap Analysis' referenced previously.

This concept is a way of implementing Circular Economy principles, which are a key part of Te rautaki para, in a practical resource recovery network infrastructure approach.

While the Circular Resource Network concept is explained in detail in appendix A.5.0, the key components of the system are explained here.

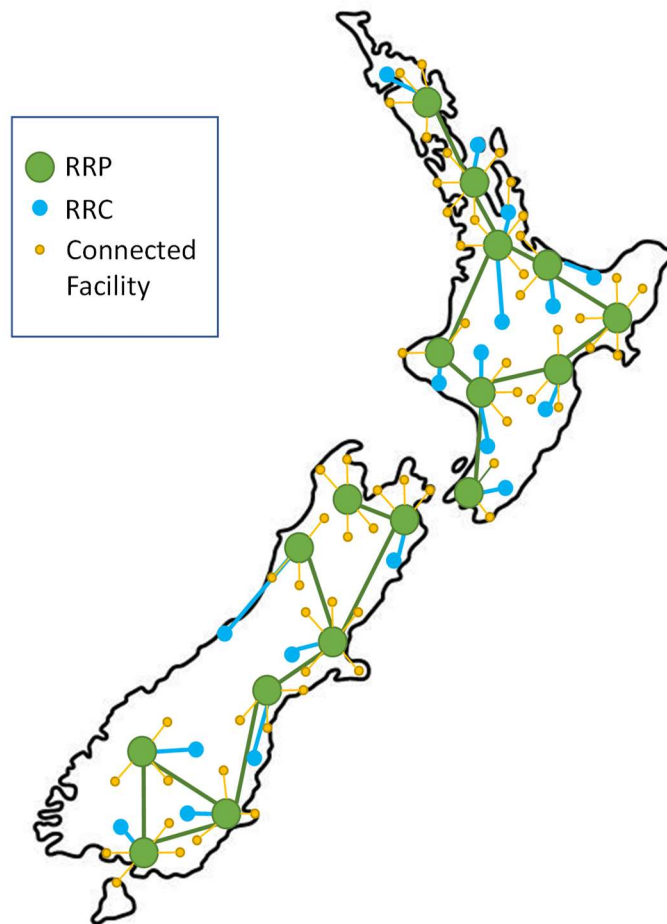
Figure 19: Concept Map of Circular Resource Network below shows a high-level visual representation of a national resource recovery network.

The large green dots represent regional RR Parks that consolidate and process material at a regional level. Depending on the material stream, materials could also be transported between the regional hubs (for example glass being consolidated in Christchurch for shipping to Auckland for manufacture). Regional hubs could also specialise in processing certain materials and swap materials accordingly.

The mid-sized blue dots represent local RR Centres that accept a full range of materials and send to the regional RR Parks for bulking (or to Connected Facilities for local processing). Not shown are smaller drop off sites.

The small yellow dots represent the potentially hundreds of facilities that are not co-located at an RR Park or RR Centre but are linked and operate to the standards of the network. These facilities could accept materials from the RR Park or RR Centres for processing, or supply materials to these sites.

Figure 12: Concept Map of Circular Resource Network



The key roles and components of the system are:

RR Parks – Regional Hubs: The heart of each regional network consists of one or two large RR Parks, where a range of key functions are co-located. The purpose of the RR Park is to provide a ‘hub’ for the efficient regional consolidation of a wide range of materials collected at the RR Centre and Connected Facilities, as well as those that may be collected at the RR Park itself.

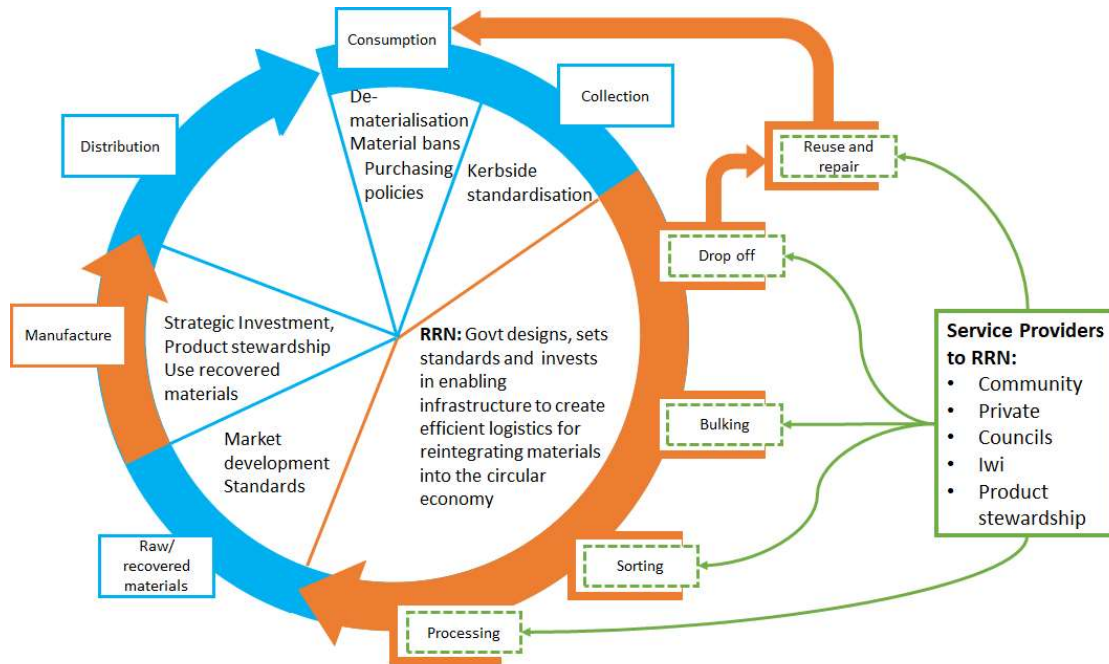
Local RR Centres: While the RR Parks are the hub of the regional networks, the RR Centre form the primary nodes, where the majority of material is dropped off and consolidated locally. Many RR Centres will start off as local transfer station sites that are upgraded and re-purposed to have a predominant focus on resource recovery.

Connected Facilities: While the heart of the circular resource network is the RR Park and RR Centre, a key feature of the circular resource network concept is the connection of potentially all resource recovery operations to the network. A range of resource recovery businesses that are not/do not need to be co-located at a network site are connected virtually. The facilities could be owned or operated by regional or national agencies, TAs, private sector, iwi, or community sector or through partnerships. As noted earlier, these

facilities would operate to the same standards as co-located facilities and could participate in the logistics and virtual network arrangements.

The figure below illustrates how the roles and functions of a national resource recovery network could integrate to provide key reverse logistics functions in the circular economy. The orange elements of the circle are the parts that form the circular resource network.

Figure 13: Roles and Functions of a Circular Recovery Network in the Circular Economy



In the above chart material flows around in a clockwise direction. The arrows represent the material flows. The boxes indicate the key steps within the value chain. The graphic shows how different providers to the can deliver all of the key functions, but within an overall connected framework (that is established and overseen by central/regional/local government).

8.2 Options Categorised by Work Area

These sections present the high-level options to address the key issues described above, broken down into the categories of regulation, measuring/monitoring, education/engagement, collections/services, infrastructure, and leadership/management. Options are presented this way as the role of TAs is likely to be fairly consistent within each of these categories and one option may address a number of key issues; also this enables the options to show a progression of options in one category with (for example) an increasing level of circular economy alignment.

The Council’s roles could be:

Strategic: Simply identify the need at a strategic level, with other sectors able to respond to the need as they wish

Facilitation/Leadership: Take a facilitation and leadership role in addressing the need, such as by creating working groups focusing on a particular material e.g. construction waste

Regulator: Use regulatory tools available to councils to create an environment that encourages solutions, such as requiring construction site waste management plans, banning certain materials from landfill, etc.

Funder: Influence the way gaps addressed by others by making funding available for specific initiatives that address the need in some way

Provider: Take direct action by providing services or facilities that address the need.

8.2.1 Regulation

Ref	Option	Issues Addressed	Impact on Current/Future Demand Alignment with Te rautaki para	Council’s Role
R1	Expand the solid waste bylaw provisions to increase regulation of the private waste sector – e.g. use of 240L wheeled bins; event waste management, construction site waste management plans, material bans in kerbside collections	<p>Large quantities of organic waste and some recyclables still going to landfill.</p> <p>Poor understanding of rural waste streams, construction and demolition waste.</p> <p>Increase monitoring and reporting required by central government.</p>	<p>Having access to better data enables better management of waste streams and future identification of issues.</p> <p>Preventing the use of 240L wheeled bins for household rubbish collections will improve waste diversion.</p> <p>Te rautaki para goal 1 priority 1.1</p>	Regulator

8.2.2 Measuring and Monitoring

Ref	Option	Issues Addressed	Impact on Current/Future Demand Alignment with Te rautaki para	Council's Role
M1	Collect participation and set out rates for all services by locality to identify any areas where this is a particular issue	Organic waste and recyclables going to landfill, despite dedicated kerbside services for these waste streams.	Will enable Council to identify localities where there is low participation in services, or high contamination, and target education and engagement accordingly. Te rautaki para goal 1, priority 1.3	Provider
M2	Introduce proactive monitoring of contamination in recycling bins and a warning system for excess contamination	Organic waste and recyclables going to landfill, despite dedicated kerbside services for these waste streams – potentially as a result of poor understanding of what materials are accepted.	Will enable Council to identify localities where there is high contamination, and target education and engagement accordingly. Te rautaki para goal 1, priority 1.3	Regulator, Provider
M3	Increase monitoring and surveying of rural wastes going to landfill; e.g. quantities and material types	More understanding and proactive management required for rural wastes – both from rural households, and from agricultural properties.	Better understanding across the board of non-household waste management and opportunities to move up the hierarchy. Te rautaki para goal 1, priority 1.5; goal 2, priority 2.4	Regulator, Provider
M4	Identify and introduce appropriate systems to Class 3/4 fills to enable types, quantities, and sources of waste to be monitored	More intensive management required for Class 3/4 fills to meet reporting requirements and encourage better waste management.	Closer monitoring will ensure that users are being charged appropriately; that materials comply with acceptance criteria, and that Council can fulfil central government reporting requirements accurately.	Regulator, Provider

Te rautaki para goal 1, priority 1.5;
goal 2, priority 2.4

8.2.3 Education and Engagement

Ref	Option	Issues Addressed	Impact on Current/Future Demand Alignment with Te rautaki para	Council's Role
EE1	Identify opportunities for consistent, targeted, direct engagement that can be delivered where there is low participation in recycling and/or organic waste services, and/or high contamination.	Large quantities of household organic waste and some household recyclables still going to landfill.	Need for education/ engagement (i.e. demand) is proactively identified and addressed. Te rautaki para goal 3, priorities 3.1 and 3.2	Provider
EE2	Continue to seek wider engagement with industry, community, and other agencies through regional and national waste action groups (e.g., C&D, health, retail, industry).	<p>Improve the management of specific materials, moving up the hierarchy, by engaging with the sources – C&D waste, non-household recyclables, agricultural wastes, vapes, etc.</p> <p>Kerbside diversion performance standards and reporting requirements set by central government require changes in management for wastes outside Council's direct control.</p> <p>High proportion of event waste from public events could be diverted by improved waste management and diversion practices</p> <p>Reduced influence over the management of some wastes resulting from the new private RTS.</p> <p>Proactive disaster and medical waste management.</p>	<p>Improved understanding of needs in the region and service gaps, and who is best to address them.</p> <p>Collaborate with the community and industry would improve their engagement, understanding, and awareness of waste issues, and enable closer relationships with other agencies such as Te Whatu Ora.</p> <p>Increased responsibility taken by various sectors for waste management within the community.</p> <p>Better understanding across the board of non-household waste management and opportunities to move up the hierarchy.</p>	<p>Facilitation/Leadership, Funder, Provider.</p> <p>Council could initiate groups and facilitate, possibly with low-level funding for project work.</p> <p>Council could provide options that support these other sectors in moving up the hierarchy.</p> <p>Ideally this would continue to be progressed through the CWJC.</p>

			Te rautaki para goal 1, priority 1.5; goal 2, priority 2.4	
EE3	Work closely with mana whenua, community groups, social enterprise, non-government organisations etc to develop and enable locally-led waste minimisation engagement and education, and support existing initiatives locally such as Sharewaste and Foodprint.	<p>Large quantities of household organic waste and some household recyclables still going to landfill, suggesting lack of understanding of waste issues and what the services are for.</p> <p>High levels of contamination in recycling and FOGO bins.</p> <p>Encourage participation in services such as kerbside recycling and FOGO collections.</p> <p>E&E can be targeted in areas where it is needed and delivered locally.</p> <p>High proportion of event waste from public events could be diverted by improved waste management and diversion practices.</p> <p>Management of specific materials needs to be improved, especially moving up the hierarchy, by engaging with the sources – C&D waste, non-household recyclables, agricultural wastes, medical wastes etc. and reducing environmental harm.</p>	<p>Need for education/ engagement (i.e. demand) is proactively identified and addressed.</p> <p>Collaborate with the community and industry would improve their engagement, understanding, and awareness of waste issues.</p> <p>Increased responsibility taken by various sectors for waste management within the community.</p> <p>Better understanding across the board of non-household waste management and opportunities to move up the hierarchy.</p> <p>Te rautaki para goal 1 priority 1.5; goal 3 priority 3.1 and 3.2</p>	<p>Facilitation/Leadership, Funder, Provider.</p> <p>Council should identify and facilitate collaboration with and between local groups to enable waste minimisation education and engagement.</p>

8.2.4 Collection & Services

Ref	Option	Issues Addressed	Impact on Current/Future Demand Alignment with Te rautaki para	Council's Role
CS1	Alter kerbside services as necessary to comply with government's kerbside standardisation requirements.	Central government requirements for kerbside services such as standardised materials and performance targets.	Kerbside services would be aligned with central government's kerbside standardisation requirements.	Provider

			Te rautaki para goal 2, priority 2.1; goal 5 priorities 5.2 and 5.3	
CS2	Work with other Canterbury councils to identify and implement any additional improvements to kerbside recycling collections – e.g., a transition to glass-out collections.	Central government requirements for kerbside services such as standardised materials and performance targets.	<p>Kerbside services would be aligned with central government’s kerbside standardisation requirements.</p> <p>Te rautaki para goal 2, priority 2.1; goal 5 priorities 5.2 and 5.3</p>	Provider
CS3	Support/introduce virtual trading marketplaces e.g., freecycle pages, Civilshare.	Management of specific materials needs to be improved, especially moving up the hierarchy, by engaging with the sources – C&D waste, non-household recyclables, etc. and reducing environmental harm.	<p>Meets demand for materials, and demand for increased reuse.</p> <p>Te rautaki para goal 1, priority 1.5; goal 2, priority 2.4; goal 3 priority 3.2, goal 4 priority 4.1 and 4.3</p>	Facilitate/leadership, and/or provision
CS4	Work with local providers (private, iwi and community groups) to implement and/or encourage improved commercial service provision – e.g., recyclables, construction waste.	<p>Management of specific materials needs to be improved, especially moving up the hierarchy, by engaging with the sources – C&D waste, non-household recyclables, agricultural wastes, medical wastes etc. and reducing environmental harm.</p> <p>Other materials going to landfill such as cardboard, paper, and textiles from both residential and ICI sources.</p>	Te rautaki para goal 2, priority 2.3, 2.4; goal 4 priority 4.1; goal 5 priority 5.3; goal 6 priority 6.1; goal 7 priority 7.2 (where C&D waste is organic in nature)	Provider or Facilitation – ideally as a regional initiative
CS5	Work with product stewardship providers to encourage better service provision and awareness raising for key materials such as farm waste (containers and wrap), textiles, polystyrene.	<p>Management of specific materials needs to be improved, especially moving up the hierarchy, by engaging with the sources – C&D waste, non-household recyclables, agricultural wastes, medical wastes etc. and reducing environmental harm.</p> <p>Other materials going to landfill such as cardboard, paper, and textiles from both residential and ICI sources.</p>	Te rautaki para goal 2, priority 2.3, 2.4; goal 4 priority 4.1; goal 5 priority 5.3; goal 6 priority 6.1;	Facilitation – ideally as a regional initiative

8.2.5 Infrastructure

Infrastructure options have been categorised into infrastructure that addresses a specific material (such as C&D, or organic waste) and then into progressively increasing levels of alignment with circular economy principles and achieving a Circular Resource Network.

Ref	Option	Issues Addressed	Impact on Current/Future Demand Alignment with Te rautaki para	Council's Role
<i>Infrastructure for specific materials</i>				
IN1	Processing for ICI and C&D waste and provision for C&D deconstruction; potentially in partnership with private sector.	<p>Management of specific materials needs to be improved, especially moving up the hierarchy, by engaging with the sources – C&D waste, non-household recyclables, agricultural wastes, medical wastes etc. and reducing environmental harm.</p> <p>Other materials going to landfill such as cardboard, paper, and textiles from both residential and ICI sources.</p>	<p>Meet demand for C&D waste diversion.</p> <p>Te rautaki para goal 2, priority 2.3, 2.4; goal 4 priority 4.1; goal 5 priority 5.3; goal 6 priority 6.1; goal 7 priority 7.2 (where C&D waste is organic in nature).</p>	Strategic and/or facilitation/leadership and/or funder and/or provider
IN2	Processing for difficult materials e.g., soft plastics, agricultural containers.	<p>Management of specific materials needs to be improved, especially moving up the hierarchy, by engaging with the sources – C&D waste, non-household recyclables, agricultural wastes, medical wastes etc. and reducing environmental harm.</p> <p>Other materials going to landfill such as cardboard, paper, and textiles from both residential and ICI sources.</p>	<p>Meet demand for regional processing of difficult materials.</p> <p>Te rautaki para goal 2, priority 2.3 and 2.4; goal 4 priority 4.1; goal 5 priority 5.3</p>	Strategic and/or facilitation/leadership and/or funder and/or provider
<i>Circular Resource Network – First steps</i>				
Te rautaki para goal 1 priority 1.5; goal 2 priorities 2.1, 2.3, 2.4; goal 4 priorities 4.1 and 4.3; goal 5 priority 5.3; goal 7 priority 7.2				

Ref	Option	Issues Addressed	Impact on Current/Future Demand Alignment with Te rautaki para	Council's Role
IN3	Provide for repair sites, community workshops, demonstrations, and courses at key network sites.	Improving diversion for a range of materials.	There will be better access to infrastructure across the district, with consistent provision of the various facilities, materials accepted, and education/engagement undertaken.	Collaborate and/or facilitate/leadership and/or provision. Deliver regionally where possible.
IN4	Standardised signs and branding, material acceptance and quality standards, customer service.	Supports many other initiatives.	Supports actions to meet many key issues.	Facilitate/leadership – direct provision
IN5	Provide space for product stewardship schemes collection points at network sites.	Supports and enables diversion of several difficult materials. Could support focus on higher levels of waste hierarchy (depending on PS system).	Enables better management of many difficult materials.	Facilitate/leadership – direct provision
IN6	Provide for container reuse at network sites (e.g., collection space).	Supports focus on higher levels of waste hierarchy. Supports better management of some difficult materials.	Increases reuse of materials.	Facilitate/leadership – direct provision
<i>Circular Resource Network – Extended</i>				
Te rautaki para (in addition to above) goal 2 priorities 2.2 (and more strongly supports 2.1, 2.3 and 2.4 than above); goal 4 priorities 4.2 (more strongly supports 4.1 and 4.3 than above); goal 5 priorities 5.2 and 5.4				
IN7	Expand regional hub provision by expanding existing site, or splitting activities across multiple sites – e.g., focusing services for householders at one site, and commercial services at another (potentially in partnership with private sector).	Supports wider RR network, enables better material diversion.	Provides an infrastructure hub for the efficient local consolidation of a wide range of materials such as soft plastics, plastics excluded from kerbside recycling, bulky and reusable items, soft plastics, e-waste.	Facilitate/leadership – direct provision

Ref	Option	Issues Addressed	Impact on Current/Future Demand Alignment with Te rautaki para	Council's Role
IN8	Provide for product stewardship programmes within network sites for bulking and processing.	Supports and enables diversion of several difficult materials. Could support focus on higher levels of waste hierarchy (depending on product stewardship system).	Provides for better management of many difficult materials.	Facilitate/leadership – direct provision
IN9	Use standard containers and logistics across all network sites.	Supports and enables a number of other options by making capturing and diverting materials more straightforward and effective.	Makes it easier for customers to use sites and increases the efficiency of capturing materials for recovery and transferring them between different parts of the Circular Resource Network.	Facilitate/leadership – direct provision
IN10	Provide for container reuse at network sites (e.g., washing facilities).	Supports focus on higher levels of waste hierarchy. Supports better management of some difficult materials.	Increases reuse of materials.	Facilitate/leadership – direct provision
<i>Circular Resource Network – Full</i>				
Te rautaki para – all of above, to a greater extent				
IN11	Centralised coordination of network.	Maximises efficiencies and consistency, supporting better management of a wide range of materials.	TAs actively work towards having a comprehensive network of facilities supporting the collection and circular management of products and materials that supports a national network .	Facilitate/leadership – direct provision
IN12	Collaboration on inter-regional logistics.	Maximises efficiencies and consistency, supporting better management of a wide range of materials.	Provides for better management of many materials.	Facilitate/leadership – direct provision

Ref	Option	Issues Addressed	Impact on Current/Future Demand Alignment with Te rautaki para	Council's Role
IN13	Identify off-site re-processors and manufacturers and ensure that these parties are fully integrated and considered in the network design.	Maximises efficiencies and consistency, supporting better management of a wide range of materials.	Maximise the material types and quantities that can be diverted by ensuring that re-processors and manufacturers are fully considered in network design.	Facilitate/leadership – direct provision
IN14	Extend the Circular Resource Network to include industrial symbiosis parks.	Maximises efficiencies and consistency, supporting better management of a wide range of materials.	Provides for better management of more materials by facilitating the co-location and development of more waste management options, particularly those further up the waste hierarchy.	Facilitate/leadership – direct provision
IN15	Work with manufacturers & institutions to develop circular material models (e.g., product design, leasing systems etc.).	Maximises efficiencies and consistency, supporting better management of a wide range of materials.	Supports the development and implementation of circular resource networks; locally, across the region, and supporting national work; moves up the waste hierarchy by supporting prevention and reduction of waste at source.	Facilitate/leadership – direct provision

8.2.6 Leadership and Management

Ref	Option	Issues Addressed	Impact on Current/Future Demand Alignment with Te rautaki para	Council's Role
LM1	Advocate to central government for extended producer responsibility.	Implementation of product stewardship addresses problem waste streams at the source, such as vape waste.	Using the provisions in the WMA will help to ensure that the true cost of	Facilitate/leadership - advocate to central government for stronger

			<p>waste management of a product is reflected in its price.</p> <p>Product stewardship schemes for difficult waste streams such as e-waste and tyres will help Council provide management options for these waste streams.</p> <p>Te rautaki para goal 1 priority 1.1; goal 4 priorities 4.1, 4.2 and 4.3; goal 5 priorities 5.1 and 5.3; goal 7 priority 7.1</p>	<p>regulation and extended producer responsibility.</p> <p>Work with other councils and agencies to support similar lobbying efforts.</p>
LM2	Respond to central government consultations, engagements, technical advisory groups, and information sharing opportunities.	Waimakariri-specific issues are considered and reflected in national strategies, plans, regulation, and actions.	<p>Ensures that central government work supports local/regional work, and that local/regional issues are recognised.</p> <p>Te rautaki para goal 1; goal 2 priorities 2.1 and 2.4</p>	Facilitate/leadership - advocate to central government
LM3	Work closely with mana whenua, community groups, and the private sector to progress opportunities for increased waste reduction and diversion.	TAs, mana whenua, community groups and the private sector working together will increase waste reduction and diversion.	<p>Encourage the community to be more involved in waste minimisation, and potentially reduce waste and increase waste diversion.</p> <p>Te rautaki para goal 1 priority 1.5; goal 2 priority 2.4; goal 4; goal 5 priorities 5.2, 5.3 and 5.4; goal 7 priority 7.1</p>	Facilitate/leadership, funder: coordinate and support initiatives.
LM4	Continue to develop regional collaborative projects and work towards increasingly formal collaborative arrangements.	Many key issues would be more effectively resolved through regional collaboration.	<p>Puts in place collaboration arrangements that are appropriate to the collaborative work agreed.</p> <p>Te rautaki para goal 1 priority 1.5</p>	Facilitate/leadership - negotiate and agree collaborative working arrangements

<p>LM5</p> <p>Support regional and national initiatives and organisations campaigning for better waste management and minimisation such as WasteMINZ sector groups and the TAO Waste Manifesto.</p>	<p>Waimakariri/Canterbury-specific issues are considered and reflected in industry work programmes and Canterbury councils are aware and informed of work at the national scale.</p>	<p>Ensures that national scale work supports local/regional work, and that Canterbury councils are well positioned to make the most of opportunities from these national initiatives and organisations.</p> <p>Te rautaki para goal 1 priorities 1.1 and 1.5; goal 2 priorities 2.1, 2.2 and 2.3; goal 4 priorities 4.1, 4.2 and 4.3; goal 5 priorities 5.1 and 5.3; goal 7 priority 7.1</p>	<p>Facilitate/leadership: be involved, coordinate and support initiatives.</p>
<p>LM6</p> <p>Support regional and national projects improving waste management planning in disaster situations.</p>	<p>Proactive planning in place for disaster waste.</p>	<p>Proactive planning in place for disaster waste.</p> <p>Te rautaki para goal 1 priority 1.5</p>	<p>Facilitate/leadership - provide information as requested, and any other input required.</p>
<p>LM7</p> <p>Support national sector organisations in lobbying for better vocational training and to encourage new recruits to the sector.</p>	<p>Relevant issues relating to staff and vehicle resources are incorporated in national-level work and addressed at a national level.</p>	<p>Ensures that Waimakariri/Canterbury -focused issues are incorporated in national-level work on these issues.</p> <p>Te rautaki para goal 1 priority 1.5; goal 2 priority 2.1; goal 5 priority 5.2</p>	<p>Facilitate/leadership – provide support and information to national sector organisations.</p>

The options identified and Council's possible role in meeting forecast demand comprise a range of proposals. The specific actions and timeframes for delivery will be identified through the development of draft Waste Management and Minimisation Plans, and will be dependent on the strategic direction preferred by each TA; the extent of collaboration that is desirable and possible; and the resources available to each TA.

It is expected that the implementation of the preferred options from these proposals, as will be set out in Council's draft WMMP, will meet forecast demand as well as support Council's goals and objectives for waste management and minimisation and the phase 1, 2 and 3 goals of Te rautaki para. These goals and objectives will be confirmed as part of the development and adoption of the draft WMMP.

8.3 Statement of Extent

In accordance with section 51 (f), a Waste Assessment must include a statement about the extent to which the proposals will (i) ensure that public health is adequately protected, (ii) promote effective and efficient waste management and minimisation.

8.3.1 Protection of Public Health

The Health Act 1956 requires councils to ensure the provision of waste services adequately protects public health. The Waste Assessment has identified potential public health issues, and appropriate mechanisms to manage these risks would be a part of any implementation programme.

In respect of Council-provided waste and recycling services, public health issues are and will continue to be addressed through setting appropriate performance standards for waste service contracts and ensuring performance is monitored and reported on, and that there are appropriate structures within the contracts for addressing issues that arise.

Privately-provided services can be regulated through local bylaws where necessary.

Uncontrolled disposal of waste, for example in rural areas and in cleanfills, can be regulated at a local, regional and central government level. Recent regulation adopted by government has extended both levy requirements and information reporting requirements to a wider range of facilities, and TAs will work with the regional council to ensure that waste issues are reflected appropriately in the developing regional plan/s.

It is considered that, subject to any further issues identified by the Medical Officer of Health, the proposals would adequately protect public health.

8.3.2 Effective and Efficient Waste Management and Minimisation

The Waste Assessment has investigated current and future quantities of waste and diverted material, and outlines Council's potential roles in meeting the forecast demand for services.'

It is considered that the process of forecasting has been robust, and that Council's intended role in meeting these demands is appropriate in the context of the overall statutory planning framework.

Therefore, it is considered that the proposals would promote effective and efficient waste management and minimisation.

9 Statement of Council's Intended Role

9.1 Statutory Obligations and Powers

Councils have a number of statutory obligations and powers in respect of the planning and provision of waste services. These include the following:

- Under the WMA each Council “must promote effective and efficient waste management and minimisation within its district” (s 42). The WMA requires TAs to develop and adopt a Waste Management and Minimisation Plan (WMMP).³⁵
- The WMA also requires TAs to have regard to the New Zealand Waste Strategy, Te rautaki para.
- Under Section 17A of the Local Government Act 2002 (LGA) local authorities must review the provision of services and must consider options for the governance, funding and delivery of infrastructure, local public services and local regulation. There is substantial cross over between the section 17A requirements and those of the WMMP process in particular in relation to local authority service provision.
- Under the Local Government Act 2002 (LGA) Councils must consult the public about their plans for managing waste.
- Under the Resource Management Act 1991 (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.
- Under the Litter Act 1979 TAs have powers to make bylaws, issue infringement notices, and require the clean-up of litter from land.
- The Health Act 1956. Health Act provisions for the removal of refuse by local authorities have been repealed by local government legislation.
- The Hazardous Substances and New Organisms Act 1996 (the HSNO Act). 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

³⁵ The development of a WMMP in the WMA is a requirement modified from Part 31 of the LGA 1974, but with even greater emphasis on waste minimisation.

more stringent controls relating to the use of land for storing, using, disposing of or transporting hazardous substances.

- Under current legislation and the new Health and Safety at Work Act the Council has a duty to ensure that its contractors are operating in a safe manner.

Council, in determining their role, needs to ensure that their statutory obligations, including those noted above, are met.

9.2 Overall Strategic Direction and Role

The role taken by Councils in implementing the options described in the previous section can vary significantly, for example Councils can:

- simply identify the need at a strategic level, with other sectors able to respond to the need as they wish;
- take a facilitation and leadership role in addressing the need, such as by creating working groups focusing on a particular material e.g., construction waste;
- regulator - use regulatory tools available to Councils to create an environment that encourages solutions, such as requiring construction site waste management plans, banning certain materials from landfill, etc.;
- influence the way gaps are addressed by others by making funding available for specific initiatives that address the need in some way; and
- take direct action by providing services or facilities that address the need.

The overall strategic direction and role is presented in the Waste Management and Minimisation Plan.

10 Statement of Proposals

Based on the options identified in this Waste Assessment and the Council's intended role in meeting forecast demand a range of proposals have been put forward in section 8. Actions and timeframes for delivery of priority proposals are identified in the Draft Waste Management and Minimisation Plan.

It is expected that the implementation of these proposals will meet forecast demand for services as well as support the Council's goals and objectives for waste management and minimisation. These goals and objectives will be confirmed as part of the development and adoption of the Waste Management and Minimisation Plan.

10.1 Statement of Extent

In accordance with section 51 (f), a Waste Assessment must include a statement about the extent to which the proposals will (i) ensure that public health is adequately protected, (ii) promote effective and efficient waste management and minimisation.

10.1.1 Protection of Public Health

The Health Act 1956 requires the Council to ensure the provision of waste services adequately protects public health.

The Waste Assessment has identified potential public health issues associated with each of the options, and appropriate initiatives to manage these risks would be a part of any implementation programme.

In respect of Council-provided waste and recycling services, public health issues will be able to be addressed through setting appropriate performance standards for waste service contracts and ensuring performance is monitored and reported on, and that there are appropriate structures within the contracts for addressing issues that arise.

Privately-provided services will be regulated through local bylaws.

Uncontrolled disposal of waste, for example in rural areas and in cleanfills, will be regulated through local and regional bylaws.

It is considered that, subject to any further issues identified by the Medical Officer of Health, the proposals would adequately protect public health.

10.1.2 Effective and Efficient Waste Management and Minimisation

The Waste Assessment has investigated current and future quantities of waste and diverted material, and outlines the Council's role in meeting the forecast demand for services.

It is considered that the process of forecasting has been robust, and that the Council's intended role in meeting these demands is appropriate in the context of the overall statutory planning framework for the Council.

Therefore, it is considered that the proposals would promote effective and efficient waste management and minimisation.

A.1.0 Medical Officer of Health Statement

Note: minor edits were made to the draft Waste Assessment following receipt of the Statement from the Medical Officer of Health.

9 November 2023

Lisa Eve
Principal Consultant
Eunomia Research & Consulting (NZ)

Dear Lisa

The Waste Minimisation Act 2008 requires that each Territorial Local Authority (TLA) must review its Waste Management and Minimisation Plan (WMMP) every 6 years. In doing so, it must make a waste assessment before conducting the review (s50 (2)).

A waste assessment must contain, amongst other things (s1(f)(i)) a statement about the extent to which the proposals contained in it will ensure that public health is adequately protected. The TLA must consider the following methods of waste management and minimisation; reduction, reuse, recycling, recovery, treatment and disposal (s44).

The feedback below is provided by the Medical Officer of Health on the Draft Waste Assessment, July 2023, prepared by Eunomia on behalf of the Waimakariri District Council. This feedback is in response to the requirement in S51 (5) (b) *In making a waste assessment the TLA must consult the Medical Officer of Health.*

1.0 Key Waste Management Public Health Issues

The Medical Officer of Health considers that the Waimakariri Draft Waste Assessment is comprehensive and has adequately identified the significant issues that are likely to be of concern in terms of public health as follows:

- Identification of the various types of wastes and collection/disposal methods
- Satisfactory collection and disposal of waste so that public health risks are controlled and mitigated
- Addressing the particular issues of hazardous waste, including medical wastes, asbestos waste and electronic waste (e-waste)
- Consideration of future population demands and consumption rates on the current system and mitigation strategies in place
- Regional co-ordination of waste management and waste minimisation

- Ensuring that a waste disposal service is available to all residents/ratepayers
- Legislative and cost barriers that inhibit mitigation of public health issues related to waste
- The health impacts of climate change and the contribution that effective waste management and waste minimisation can make to reduction in greenhouse gas emissions

2.0 Assessment of Waste Quantities and Composition

The data presented in the assessment of waste quantities and composition suggest that measurement is sufficiently detailed and regular. It is pleasing to see that the proportion of waste-flows sent to landfill has continued to decrease from 2007-2021.

The Medical Officer of Health recommends that Council plan to continue to conduct regular standardised data collection and analysis of the composition and volume of the waste stream generated in the Waimakariri District, where this material ends up, and how it is managed over the long term.

3.0 Collection Services

It is positive to see the changes to kerbside collection that were proposed in the 2015/2025 LTP have now been achieved. A regular waste collection service reduces the likelihood of illegal dumping and prevents the accumulation of waste that may attract pests and create unpleasant odours, in turn leading to improved public health outcomes.

4.0 Food Scraps and Garden Organics Scheme

The Draft Waste Assessment notes that “over 65% of households have chosen to subscribe to the organics collection service, which is a high number for an optional service.” Despite this, the data presented in the Waste Assessment show that organics make up over a quarter of all waste sent to landfill, and that the proportion for kerbside collected rubbish is higher still. The predominant source of greenhouse gas emissions from waste disposal is the decomposition of organic wastes such as food scraps and organic waste in the anaerobic environment of a landfill that create leachate and methane, both being deleterious to public health.

Council is encouraged to consider replacing the optional Food Scraps and Garden Organics (FOGO) scheme with a universal provision scheme in order to further encourage and enable reduction of the FOGO component of the waste stream sent to landfill.

5.0 Medical Waste

As mentioned in the Waste Assessment, a significant proportion of in-home medical waste is currently disposed of through general waste systems and this could result in significant health and safety concerns for the collection and processing staff. The Council is encouraged to work with Te Whatu Ora Waitaha - Canterbury and medical waste service providers to ensure appropriate services are put in place to protect staff involved in the collection and processing of domestic medical waste.

6.0 Diverted Waste Streams

Diversion of reusable materials from waste streams and the provision of public collection points for product stewardship schemes are both positive actions that promote environmental protections which in turn support health. It is pleasing to see a commitment to identifying and engaging in opportunities in this space. However, the Medical Officer of Health cautions that diverted and collected materials that are stockpiled in the absence of a complete management pathway can constitute public health hazards if not carefully managed. Consolidation/bulking services must minimise fire, vermin, odour and other risks associated with stockpiled materials. Circular resource networks, as described in section

8.1, require careful assessment for true circularity prior to initiation, lest the receptive capacity be misaligned with input demand, resulting in the formation of unwieldy stockpiles which can quickly become public health threats.

7.0 Management of Historic Waste Disposal Sites

Council manages five closed landfills at Rangiora, Kaiapoi, Oxford, Mandeville, and Cust. The Waste Assessment also notes that on-farm waste burial is a practise that has been (and may still be) used in the region.

The Medical Officer of Health encourages Council to consider how hazards to public health from these sites, such as leachate contamination of groundwater, are identified, monitored and managed.

8.0 Waste Education and Minimisation Programmes

The Medical Officer of Health commends Council on their ongoing commitment to communication and education initiatives in their effort to reduce waste. Education is an important part of empowering individuals and communities in making informed decisions and changing behaviours that in turn support policy. It is encouraging to see this collaborative approach has identified mana whenua as being significant to this process.

Section 8.2.3 Education and Engagement focusses on the options and proposals for

Council to deliver education to communities “where there is low participation in recycling and/or organic waste services, and/or high contamination”. The Medical Officer of Health encourages Council to consider why participation is low or contamination high and to engage with these communities to discover this. A lack of education may not necessarily be the most important barrier to their participation. The Medical Officer of Health supports bi-directional engagement with the public, with specific strategies developed for ensuring Māori, as well as other groups’ aspirations, priorities, and needs are understood and provided for.

9.0 Currency and Correctness of Waste Assessment

There are some inconsistencies relating to the public health content which we suggest be corrected in the final version of the document:

- Section 7.9.2 Medical Waste refers to potential benefits of Council working with DHBs and other medical service providers. Please note that DHBs have been disestablished under the Pae Ora (Healthy Futures) Act 2022. The local health authority is now Te Whatu Ora Waitaha - Canterbury.
- Section 9.1 Statutory Obligations and Powers states: “The Public Health Bill is currently progressing through Parliament.” Please note that this Bill was discharged in 2015 without ever having become law. We suggest that the currency of all legislation referenced in the Waste Assessment is checked to ensure that legal obligations and powers are fully understood and addressed.

Thank you for the opportunity to comment on the Waimakariri District Council’s Draft Waste Assessment.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'C Brunton', with a long horizontal stroke extending to the right.

Dr Cheryl Brunton
Medical Officer of Health
Te Mana Ora | National Public Health Service
Waitaha | Canterbury

A.2.0 Glossary of Terms

Class 1-5 disposal facilities	Classification system for facilities where disposal to land takes place. The classification system is provided in 0 below for reference.
Cleanfill	A cleanfill (properly referred to as a Class 5 landfill) is any disposal facility that accepts only cleanfill material. This is defined as material that, when buried, will have no adverse environmental effect on people or the environment.
C&D Waste	Waste generated from the construction or demolition of a building including the preparation and/or clearance of the property or site. This excludes materials such as clay, soil and rock when those materials are associated with infrastructure such as road construction and maintenance, but includes building-related infrastructure.
Diverted Material	Anything 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 domestic activity in households.
ETS	Emissions Trading Scheme
ICI	Industrial, Commercial, Institutional
Landfill	A type of disposal facility as defined in S.7 of the Waste Minimisation Act 2008, excluding incineration. Includes, by definition in the WMA, only those facilities that accept 'household waste'. Also referred to as a Class 1 landfill.
LGA	Local Government Act 2002
Managed Fill	A Class 3 disposal site requiring a resource consent to accept well-defined types of non-household waste, e.g. low-level contaminated soils or industrial by-products, such as sewage by-products.
MfE	Ministry for the Environment

MRF	Materials Recovery Facility
MSW	Municipal Solid Waste
NZ	New Zealand
NZWS	New Zealand Waste Strategy
PS	Product Stewardship programmes
Putrescible, garden, greenwaste	Plant based material and other bio-degradable material that can be recovered through composting, digestion or other similar processes.
RRP	Resource Recovery Park
RTS	Refuse Transfer Station
Service Delivery Review	As defined by s17A of the LGA 2002. Councils are required to review the cost-effectiveness of current arrangements for meeting the needs of communities within its district or region for good-quality local infrastructure, local public services, and performance of regulatory functions. A review under subsection (1) must consider options for the governance, funding, and delivery of infrastructure, services, and regulatory functions.
TA	Territorial Authority (a city or district council)
Waste	Means, according to the WMA: <ul style="list-style-type: none"> a) Anything disposed of or discarded, and 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 c) To avoid doubt, includes any component or element of diverted material, if the component or element is disposed of or discarded.
WA	Waste Assessment as defined by s51 of the Waste Minimisation Act 2008. A Waste Assessment must be completed whenever a WMMP is reviewed
WMA	Waste Minimisation Act 2008

WMMP

A Waste Management and Minimisation Plan as defined by s43 of the Waste Minimisation Act 2008

WWTP

Wastewater treatment plant

A.3.0 Classifications for Disposal to Land

MfE have classified disposal and other waste facilities under two regulations, which enable the application of the disposal levy and the collection of data. Facilities had also previously been categorised according to the WasteMINZ 'Technical Guidelines for the Disposal of Waste to Land', and there are some slight variations between the two.

A.3.1 Technical Guidelines Definitions

Class 1 - Landfill

A Class 1 landfill is a site that accepts municipal solid waste. A Class 1 landfill generally also accepts C&D waste, some industrial wastes and contaminated soils. Class 1 landfills often use managed fill and clean fill materials they accept, as daily cover.

Class 1 landfills require:

- a rigorous assessment of siting constraints, considering all factors, but with achieving a high level of containment as a key aim;
- engineered environmental protection by way of a liner and leachate collection system, and an appropriate cap, all with appropriate redundancy; and
- landfill gas management.

A rigorous monitoring and reporting regime is required, along with stringent operational controls. Monitoring of accepted waste materials is required, as is monitoring of sediment runoff, surface water and groundwater quality, leachate quality and quantity, and landfill gas.

Waste acceptance criteria (WAC) comprises:

- municipal solid waste; and
- for potentially hazardous leachable contaminants, maximum chemical contaminant leachability limits (TCLP) from Module 2 Hazardous Waste Guidelines – Class A4.

WAC for potentially hazardous wastes and treated hazardous wastes are based on leachability criteria to ensure that leachate does not differ from that expected from non-hazardous municipal solid waste.

For Class 1 landfills, leachability testing should be completed to provide assurance that waste materials meet the WAC.

Class 2 Landfill

A Class 2 landfill is a site that accepts non-putrescible wastes including C&D wastes, inert industrial wastes, managed fill material and clean fill material. C&D waste can contain biodegradable and leachable components which can result in the production of leachate – thereby necessitating an increased level of environmental protection. Although not as strong as Class 1 landfill leachate, Class 2 landfill leachate is typically characterised by mildly acidic pH, and the presence of ammoniacal nitrogen and soluble metals, including heavy metals. Similarly, industrial wastes from some activities may generate leachates with chemical characteristics that are not necessarily organic.

Class 2 landfills should be sited in areas of appropriate geology, hydrogeology and surface hydrology. A site environmental assessment is required, as are an engineered liner, a leachate collection system, and groundwater and surface water monitoring. Additional engineered features such as leachate treatment may also be required.

Depending on the types and proportions of C&D wastes accepted, Class 2 landfills may generate minor to significant volumes of landfill gas and/or hydrogen sulphide. The necessity for a landfill gas collection system should be assessed.

Operational controls are required, as are monitoring of accepted waste materials, monitoring of sediment runoff, surface water and groundwater quality, and monitoring of leachate quality and quantity.

Waste acceptance criteria comprises:

- a list of acceptable materials; and
- • maximum ancillary biodegradable materials (e.g. vegetation) to be no more than 5% by volume per load; and
- • maximum chemical contaminant leachability limits (TCLP) for potentially hazardous leachable contaminants.

Class 3 Landfill – Managed/Controlled Fill

A Class 3 landfill accepts managed fill materials. These comprise predominantly clean fill materials, but may also include other inert materials and soils with chemical contaminants at concentrations greater than local natural background concentrations, but with specified maximum total concentrations.

Site ownership, location and transport distance are likely to be the predominant siting criteria. However, as contaminated materials (in accordance with specified limits) may be accepted, an environmental site assessment is required in respect of geology, stability, surface hydrology and topography.

Monitoring of accepted material is required, as are operational controls, and monitoring of sediment runoff and groundwater.

Waste acceptance criteria comprises:

- a list of acceptable solid materials; and
- maximum incidental or attached biodegradable materials (e.g. vegetation) to be no more than 2% by volume per load; and

- maximum chemical contaminant limits.

A Class 3 landfill does not include any form of engineered containment. Due to the nature of material received it has the potential to receive wastes that are above soil background levels. The WAC criteria for a Class 3 landfill are therefore the main means of controlling potential adverse effects.

For Class 3 landfills, total analyte concentrations should be determined to provide assurance that waste materials meet the WAC.

Class 4 Landfill – Controlled Fill

A Class 4 landfill accepts controlled fill materials. These comprise predominantly clean fill materials, but may also include other inert materials and soils with chemical contaminants at concentrations greater than local natural background concentrations, but with specified maximum total concentrations.

Site ownership, location and transport distance are likely to be the predominant siting criteria. However, as contaminated materials (in accordance with specified limits) may be accepted, an environmental site assessment is required in respect of geology, stability, surface hydrology and topography.

Monitoring of accepted material is required, as are operational controls, and monitoring of sediment runoff and groundwater.

Waste acceptance criteria comprises:

- a list of acceptable solid materials; and
- maximum incidental or attached biodegradable materials (e.g. vegetation) to be no more than 2% by volume per load; and
- maximum chemical contaminant limits.

A Class 4 landfill does not include any form of engineered containment. Due to the nature of material received it has the potential to receive wastes that are above soil background levels. The WAC criteria for a Class 4 landfill are therefore the main means of controlling potential adverse effects.

Class 5 Fil – Cleanfill

A Class 5 fill accepts only clean fill material. The principal control on contaminant discharges to the environment from Class 5 fills is the waste acceptance criteria.

Stringent siting requirements to protect groundwater and surface water receptors are not required. Practical and commercial considerations such as site ownership, location and transport distance are likely to be the predominant siting criteria, rather than technical criteria.

Clean filling can generally take place on the existing natural or altered land without engineered environmental protection or the development of significant site infrastructure. However, surface water controls may be required to manage sediment runoff.

Extensive characterisation of local geology and hydrogeology is not usually required.

Monitoring of both accepted material and sediment runoff is required, along with operational controls.

Waste acceptance criteria:

- virgin excavated natural materials (VENM), including soil, clay, gravel and rock; and
- maximum incidental inert manufactured materials (e.g. concrete, brick, tiles) to be no more than 5% by volume per load; and
- maximum incidental⁵ or attached biodegradable materials (e.g. vegetation) to be no more than 2% by volume per load; and
- maximum chemical contaminant limits are local natural background soil concentrations.

Materials disposed to a Class 5 fill should pose no significant immediate or future risk to human health or the environment.

The WAC for a Class 5 fill should render the site suitable for unencumbered potential future land use, i.e. future residential development or agricultural land use.

The WAC for a Class 5 fill are based on the local background concentrations for inorganic elements, and provide for trace concentrations of a limited range of organic compounds.

Note: The Guidelines should be referred to directly for the full criteria and definitions.

A.3.2 Ministry for the Environment Classifications

The Ministry for the Environment have recently extended the payment of the landfill levy to a wider range of disposal facilities, and have also required reporting of data from 'cleanfills' and transfer stations. This has entailed two regulations – the first to extend the levy to other facilities³⁶ and the second to require data reporting from 'cleanfills' and transfer stations³⁷.

These regulations establish definitions for a range of disposal and other waste facilities beyond the Class 1 landfills that were captured by the landfill levy when it was first introduced.

These are summarised in the table below:

³⁶ <https://www.legislation.govt.nz/regulation/public/2021/0068/latest/LMS474556.html>

³⁷ <https://www.legislation.govt.nz/regulation/public/2021/0069/latest/whole.html>

Disposal facility class	Description	Types of waste not accepted	Examples of types of waste accepted
<p>1 Municipal Disposal Facility</p>	<p>A facility, including a landfill:</p> <ul style="list-style-type: none"> • where waste is disposed of • that operates, at least in part, as a business to dispose of waste • accepts waste that is or includes any one or more of the following: <ul style="list-style-type: none"> household waste waste from commercial or industrial sources waste from institutional sources (eg, hospitals, educational facilities and aged-care facilities) green waste (eg, degradable plant materials such as tree branches, leaves, grass, and other vegetation matter) waste that is not accepted at other disposal facilities in the WMA. <p>It is not a:</p> <ul style="list-style-type: none"> • class 2: construction and demolition disposal facility • class 3 and 4 managed or controlled fill disposal facility • an industrial monofill facility • a cleanfill facility. 		<p>Types of waste may include (but not limited to):</p> <ul style="list-style-type: none"> • mixed municipal waste from residential, commercial and industrial sources • construction and demolition waste • contaminated soils • rocks, gravel, sand, clay • sludges • slurries • putrescible waste • green waste • biosolids • clinical waste • treated hazardous waste • incidental hazardous waste.
<p>2 C&D Disposal</p>	<p>Accepts waste from construction and demolition activity It is not a:</p> <ul style="list-style-type: none"> • class 3 and 4 managed or controlled fill disposal facility • an industrial monofil facility • a cleanfill facility. 	<p>Does not accept any of the following for disposal:</p> <ul style="list-style-type: none"> • household waste • waste from commercial or industrial sources • waste from institutional sources (eg, hospitals, educational facilities, and aged-care facilities) • waste generated from a single industrial 	<p>Mixed construction and demolition waste including:</p> <ul style="list-style-type: none"> • rubble, plasterboard, treated and untreated timber • wood products, including softboard, hardboard, particle board, plywood, MDF, customwood, shingles, sawdust

		<p>process (eg, steel or aluminium-making, or pulp and paper-making) carried out in one or more locations</p> <ul style="list-style-type: none"> • Is not a class 3 and 4 managed or controlled fill facility 	<ul style="list-style-type: none"> • concrete, including reinforced or crushed concrete blocks • clay products including pipes, tiles • asphalt (all types), and roading materials, including road sub-base • plasterboard and Gibraltar board • masonry, including bricks, pavers • metal, or products containing metals, including corrugated iron, steel, steel-coated tiles, wire, wire rope, wire netting, aluminium fittings • plastic products, including plastic bags, pipes, guttering, building wrap • insulation products • laminate products, including Formica • flooring products, including carpet and underlay, vinyl/linoleum, cork tiles • paper and cardboard products, including wallpaper, lining paper, building paper • site clearance and excavation materials including soils, clays, rocks, gravel, tree stumps
<p>3/4 Managed or Controlled Fill Disposal</p>	<p>Accepts any one of the following for disposal:</p> <ul style="list-style-type: none"> • inert waste material from construction and demolition activities 	<p>Does not accept:</p> <ul style="list-style-type: none"> • household waste • waste from commercial or industrial sources 	<p>Types of waste may include (but not limited to):</p> <ul style="list-style-type: none"> • lightly contaminated soil below applicable consent limits and inert

	<ul style="list-style-type: none"> • inert waste material from earthworks or site remediation 	<ul style="list-style-type: none"> • waste from institutional sources (eg, hospitals, educational facilities, and aged-care facilities) • waste generated from a single industrial process (eg, steel or aluminium-making, or pulp and paper-making) carried out in one or more locations • waste material from construction and demolition activity (except for inert waste material). 	<p>construction and demolition materials, including:</p> <ul style="list-style-type: none"> site facilities clearance and excavation materials including soils, clays, rocks, gravel, tree stumps masonry, including bricks and pavers clay products, including pipes, tiles concrete, including crushed concrete and blocks (for reinforced concrete, exposed reinforcing must be removed) asphalt (bitumen-based only) road sub-base.
5 Cleanfill	A facility that accepts only virgin excavated natural material (such as clay, soil, or rock) for disposal	Any materials other than virgin excavated natural materials (VENM)	VENM such as clay, soil and rock
Industrial monofill	<p>A facility that accepts for disposal waste that:</p> <ul style="list-style-type: none"> • discharges or could discharge contaminants or emissions • is generated from a single industrial process (eg, steel or aluminium-making, or pulp and paper-making) carried out in one or more locations. 	<ul style="list-style-type: none"> • household waste • waste from commercial or institutional sources (eg, hospitals, educational facilities, and aged-care facilities) • waste not generated by a single industrial process. 	<p>Waste generated by industrial processes such as:</p> <ul style="list-style-type: none"> • steel-making • aluminium-making • pulp and paper • oil exploration and extraction
Transfer station	<p>A facility:</p> <ul style="list-style-type: none"> • that contains a designated receiving area where waste is received; and • from which waste or any material derived from that waste is: transferred to a final disposal site transferred elsewhere for further processing that does not itself provide 	N/A (no disposal of waste occurs)	N/A

	long-term storage for waste or material derived from that waste.		
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A.4.0 National Legislative and Policy Context

A.4.1 The New Zealand Waste Strategy 2023

The New Zealand Waste Strategy 2023 provides the Government's strategic direction for waste management and minimisation in New Zealand. This strategy was released in 2023 and replaced the 2010 Waste Strategy.

The strategy aims to provide direction to central and local government, businesses (including the waste industry), and communities on where to focus their efforts to manage waste. It will be supported by an action and investment plan (AIP) which will be developed in consultation with local authorities, the waste management sector, and others; and will set out priority actions required over the next five years. The 2023 strategy has a focus on achieving a more 'circular economy' for waste and sets out a multi-decade pathway towards this.

Under section 44 of the Waste Management Act 2008, in preparing their waste management and minimisation plan (WMMP) councils must have regard to the New Zealand Waste Strategy, or any government policy on waste management and minimisation that replaces the strategy. Guidance on how councils may achieve this is provided in section 4.4.3.

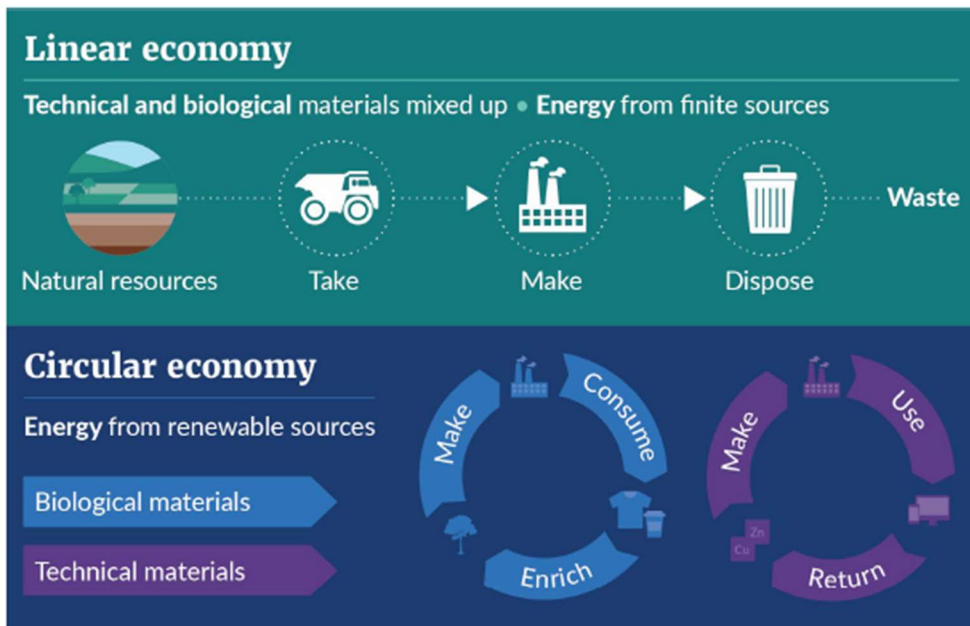
A copy of the current New Zealand Waste Strategy is available on the Ministry's website. Sections of the new strategy are discussed here in more detail.

A.4.1.1 Circular Economy principles

The strategy includes some background on circular economy, including some summary figures that compare a linear economy to a circular economy, and a revised waste hierarchy. It also emphasises the role of te ao Māori in considering waste approaches.

The figures mentioned above are shown here (with permission from MfE):

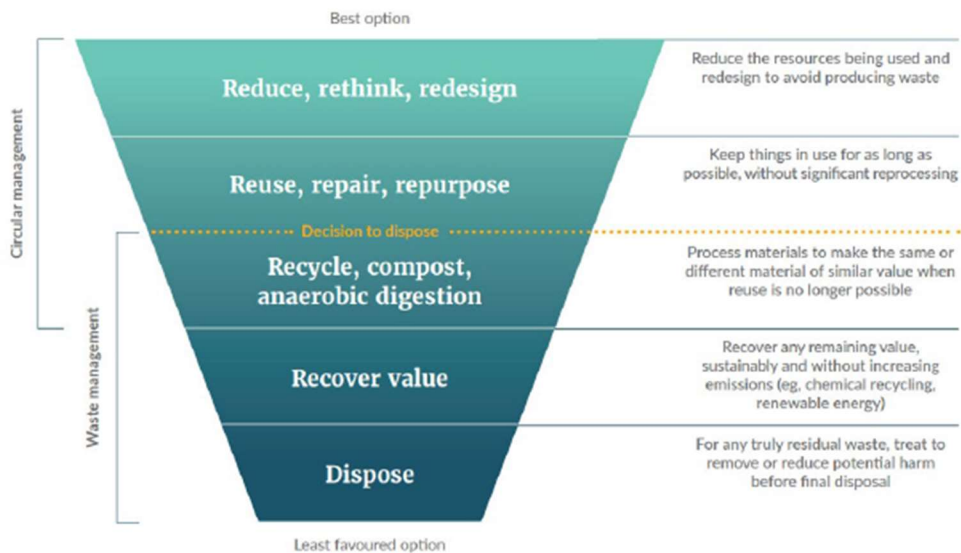
Figure 14: Characteristics of Linear and Circular Economies



Source: Te rautaki para | Waste Strategy (page 14), Ministry for the Environment 2023

The waste hierarchy is still a core principle guiding waste management and minimisation in New Zealand, but has been refined to more closely support and align with a circular economy approach.

Figure 15: Revised Waste Hierarchy



Source: Te rautaki para | Waste Strategy (page 14), Ministry for the Environment 2023

The strategy highlights several key facts that demonstrate New Zealand’s relatively poor performance in waste management and minimisation:

- emissions from waste produce 9% of New Zealand’s biogenic methane emissions, and 4% of our total greenhouse gas emissions, with organic waste decomposing in landfills contributing 94% of these emissions;
- on average, nearly 700 kg of waste per capita goes to municipal landfills³⁸ annually – compared to the OECD average of 538 kg; and trends are for this to increase;
- domestic recovery infrastructure is limited, and exporting challenging due to our relative geographic isolation and distance from markets;
- lack of data relating to waste practices, significantly non-municipal landfills and diverted materials; and
- historical management has been poor, with numerous legacy disposal sites around the country causing local environmental harm.

A.4.1.2 The Strategy

The direction of the strategy is important in many, very practical, ways; it provides a clear vision through to 2050, principles that support this vision, a phased approach with three clear stages, and targets to measure progress and encourage ambitious action.

Three key strategic issues are core to the strategy – domestic resource recovery and recycling, the role of waste to energy, and net zero emissions by 2050.

The vision is:

“By 2050, Aotearoa New Zealand is a low-emissions, low-waste society, built upon a circular economy.

We cherish our inseparable connection with the natural environment and look after the planet’s finite resources with care and responsibility.”

Six guiding principles are included.

A.4.1.3 A staged process

While the strategy has a view out to 2050, the work required to get there has been divided into three high level work stages:

1. 2022 – 30: embedding circular thinking into systems
2. 2030 – 40: expanding to make circular normal
3. 2040 – 50: Helping others do the same

Each stage has a number of goals, some of which are more relevant to TAs than others – Phase 1 is shown in the table below and has been addressed in the options list.

³⁸ ‘municipal landfill’, ‘municipal solid waste landfill’ ‘sanitary landfill’ and ‘Class 1 landfill’ are all terms that essentially refer to the same type of facility.

Phase 1 Goals – By 2030, our enabling systems are working well and behaviour is changing

The building blocks are in place to enable change

<p>Strategic planning, regulatory, investment and engagement systems are in place and operating to drive and support change</p>	<p>TAs have a role in strategic planning at a local level (through WMMPs), which will both inform and be informed by the AIP.</p> <p>TAs also have a role, albeit limited compared to the national role, to contribute through local bylaws and any local funding pools that are available.</p> <p>TAs carry out local engagement and can support national campaigns.</p>
<p>We have a comprehensive national network of facilities supporting the collection and circular management of products and materials</p>	<p>TAs will be well placed to understand what this means at a local level, and be able to drive and coordinate the development of a network approach.</p>
<p>We all take responsibility for how we produce, manage, and dispose of things, and are accountable for our actions and their consequences</p>	<p>This is likely to be aimed mainly at personal responsibility – although TAs can encourage this attitude locally.</p>
<p>Specific Priorities:</p>	<ul style="list-style-type: none"> • Support the creation of national planning, regulatory and investment systems. • Consider how the timing and interactions of central government and local government waste planning could best be integrated, and communicate to MfE. • Consider how to use waste levy funding to support the overall strategic framework of funding and investment, given the AIP context, direction and priorities – collaborate with other councils and with central government to a greater extent. • Support the development of simple ways for central and local government to collaborate and work in partnership.

	<ul style="list-style-type: none"> • Work with central government, the waste sector, and others to develop a shared view of what a ‘comprehensive national network of facilities’ looks like. • Align overall direction and approach with this. • The network needs to have nationwide coverage and include a range of products and materials, and focus on circular management options where possible. • Prioritise reducing greenhouse gas emissions. • Ensure planning and consenting teams require new builds to have appropriate space for waste management, there is space for community facilities, and feed in to regional plans to ensure they provide for a ‘coherent network’. • Identify and work with community partners to extend services into hard-to-reach areas. • Promote waste minimisation using long-term, evidence-based behaviour change programmes. • Provide timely, accurate and clear information when creating additional obligations through bylaws or introducing new services.
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More activity is circular and we produce less waste

We use fewer products and materials, and using (sic) them for longer, by making them more durable, and repairing, reusing, sharing and repurposing them	As above, TAs have a detailed understanding of what is required to enable repair, reuse, sharing and repurposing at the local level.
Resource recovery systems are operating effectively for core materials and across all regions	TAs will have a key role in developing and maintaining resource recovery systems at the local level. Regional and cross-regional collaboration will be needed to ensure these form part of a cohesive network.
We look for ways to recover any remaining value from residual waste, sustainably and without increasing emissions, before final disposal	TAs will need to consider any potential role for energy-from-waste technologies at the local and/or regional level – particularly those that operate landfills.

<p>Specific Priorities</p>	<ul style="list-style-type: none"> • Support repair initiatives by, for example, making space in resource recovery centres or other community facilities. • Think about how to cater for future reuse systems when developing infrastructure to support collection and processing of products and materials. • Take responsibility for kerbside collection of household recycling and general waste. • Find solutions to provide services to small towns and rural areas. • Implement kerbside standardisation locally. • Recover value from ‘truly residual waste’ without harming the environment. • Consider the purpose, feedstock, processing and potential energy production of any ‘waste to energy’ methodology.
<p><i>Emissions and other environmental indicators are improving</i></p>	
<p>Emissions from waste are reducing in line with our domestic and international commitments</p>	<p>Tas will need to model and monitor emissions from their local activities.</p>
<p>Contaminated land is sustainably managed and remediated, to reduce waste and emissions and enhance the environment</p>	<p>TAs are responsible for the management of their closed landfills.</p>
<p>Specific Priorities</p>	<ul style="list-style-type: none"> • Maximise the amount of organic waste being recycled into beneficial uses (composting and anaerobic digestion are options). • Implement standardised kerbside collections locally for organic wastes (with support and education). • Fund and invest in infrastructure to collect, process, manage and recycle organic waste (food, garden and C&D organics). • Landfill gas capture at Class 1 facilities by the end of 2026 or cease accepting organic waste. • Potentially implement landfill organics ban by 2030 at all Class 1 facilities. • Address the management of ‘vulnerable landfills’ if any are identified that are council’s responsibility that are not already included in a closed landfill management plan.

A.4.1.4 Targets

The strategy includes targets; although it is acknowledged that there currently isn't enough (or reliable enough) data to set an accurate baseline or monitor these fully.

TAs should consider these, however, when setting targets in their WMMPs as it would make sense for these metrics to be reflected in local target setting and monitoring. This will also provide more support to the process of monitoring these targets at a national level.

A.4.1.5 Strategic Planning Cycle

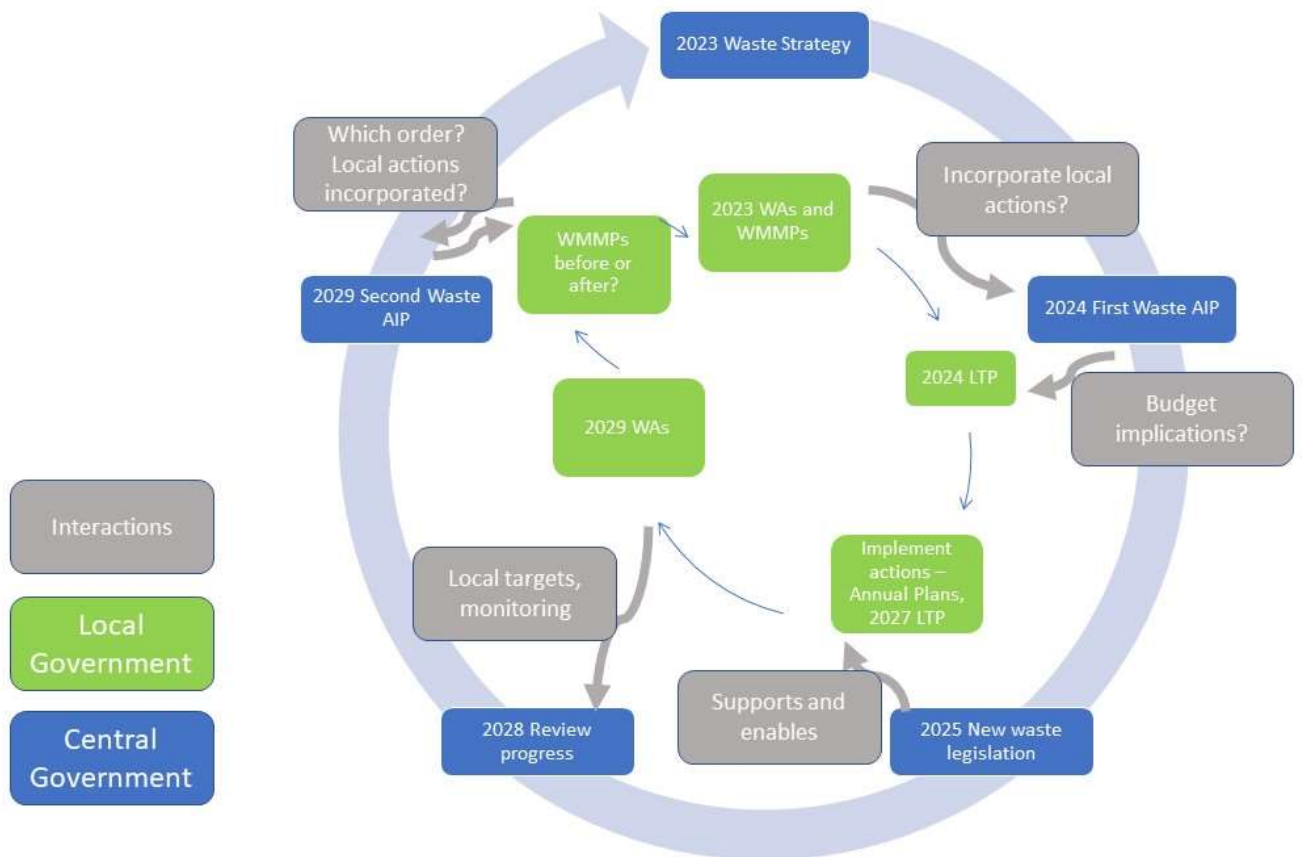
Many TAs are currently in the process of completing a Waste Assessment with a view to reviewing their WMMPs (if necessary) during the second half of 2023 so actions can be budgeted and included in 2024 LTPs. The current proposal is for the first of the MfE AIP to be out in 2024, and then a five year cycle to occur from there – so the second AIP will be due in 2029. This doesn't fit neatly with the local government planning cycle, particularly for Council which is completing a Waste Assessment during 2023 (and therefore would need to repeat this process no later than 2029).

It is not yet clear the extent to which local planning (through WMMPs) will be used to build, and be incorporated in, the AIPs. It is also not clear what the impact would be if the AIP included actions or investments that would require implementation at a local level, as is likely – and therefore may need to be included in WMMPs. Significant amendments to WMMPs do, of course, require that the full special consultative process is completed again.

The question then arises as to how TAs handle the situation where they are required, through regulation or through implementation of national AIPs and to take advantage of specific focuses for funding opportunities, to implement actions that their local communities have not had the opportunity to comment on fully through consultation.

The figure below attempts to align and show the interactions between the central and local government waste planning cycles.

Figure 16: Central and Local Government Waste Planning



A.4.1.6 Summary

The direction of the New Zealand Waste Strategy, the supporting goals, and the proposed targets all have clear implications for the future direction of waste disposal facilities in this country.

- The overall direction of the Waste Strategy is towards a circular economy, which is not supported by a landfill disposal-based linear system;
- there are specific actions relating to reducing a wide range of waste streams, and specifically and particularly organic waste – in concert with work to reduce emissions. This could extend to a ban on organic waste going to landfill; and
- the targets focus on reducing waste generation and waste disposal by 2030 – by quite significant proportions.

The overall tone of the strategic direction is not in support of continued or extended disposal of waste; and particularly not organic wastes.

A.4.2 Waste Minimisation Act 2008

The purpose of the Waste Minimisation Act 2008 (WMA) is to encourage waste minimisation and a decrease in waste disposal to protect the environment from harm and obtain environmental, economic, social and cultural benefits.

The WMA introduced tools, including:

- waste management and minimisation plan obligations for territorial authorities
- a waste disposal levy to fund waste minimisation initiatives at local and central government levels
- product stewardship provisions.

Part 4 of the WMA is dedicated to the responsibilities of a council, in that it “must promote effective and efficient waste management and minimisation within its district” (section 42).

To meet this requirement, councils are required to develop and adopt a WMMP. The development of a WMMP in the WMA is a requirement modified from Part 31 of the Local Government Act 1974, but with even greater emphasis on waste minimisation.

To support the implementation of a WMMP, section 56 of the WMA also provides councils the ability to:

- develop bylaws
- regulate the deposit, collection and transportation of wastes
- prescribe charges for waste facilities
- control access to waste facilities
- prohibit the removal of waste intended for recycling.

A number of specific clauses in Part 4 relate to the WMMP process. It is essential that those involved in developing a WMMP read and are familiar with the WMA and Part 4 in particular.

The Waste Minimisation Act 2008 (WMA) provides a regulatory framework for waste minimisation that had 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:

- Clarifies the roles and responsibilities of territorial authorities with respect to waste minimisation e.g. updating Waste Management and Minimisation Plans (WMMPs) and collecting/administering levy funding for waste minimisation projects.

- Requires that a Territorial Authority promote effective and efficient waste management and minimisation within its district (Section 42).
- Requires that when preparing a WMMP a Territorial Authority must consider the following methods of waste management and minimisation in the following order of importance:
 - Reduction
 - Reuse
 - Recycling
 - Recovery
 - Treatment
 - Disposal
 - Put a levy on all waste disposed of in a landfill.
 - Allows for mandatory and accredited voluntary product stewardship schemes.
 - 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.
 - Establishes the Waste Advisory Board to give independent advice to the Minister for the Environment on waste minimisation issues.

Various other aspects of the Waste Minimisation Act are discussed in more detail below.

A.4.3 Waste Levy

The waste levy originally came into effect from 1st July 2009, adding \$10 per tonne to the cost of landfill disposal at sites which accept household solid waste (essentially Class 1 disposal facilities). The levy has two purposes, which are set out in the Act:

- to raise revenue for promoting and achieving waste minimisation
- to increase the cost of waste disposal to recognise that disposal imposes costs on the environment, society and the economy.

This levy is collected and managed by the Ministry for the Environment (MfE) who distribute half of the revenue collected to territorial authorities (TA) on a population basis to be spent on promoting or achieving waste minimisation as set out in their WMMPs. The other half is retained by the MfE and managed by them as a central contestable fund for waste minimisation initiatives (the Waste Minimisation Fund).

In April 2021, the government introduced regulation to expand the scope of the levy from Class 1 landfills to also include classes 2-4.³⁹

The table below shows the timetable and rates for the new levy regime:

Table 23: Levy Rates by Fill Type and Year

LANDFILL CLASS	1-Jul-21	1-Jul-22	1-Jul-23	1-Jul-24
Municipal landfill (class 1)	\$20	\$30	\$50	\$60
Construction and demolition fill (class 2)		\$20	\$20	\$30
Managed fill (class 3)			\$10	\$10
Controlled fill (class 4)			\$10	\$10

<https://www.mfe.govt.nz/waste/waste-and-government>

As the landfill levy is expanded and raised, there will be an impact on the quantity of material going to the different destinations; however, the extent to which this occurs, and for which materials, depends on a number of other factors.

One impact that has been noted in some areas of New Zealand, for example, is operators choosing to close rather than add the landfill levy to their gate fee, and undertake the administrative task of monitoring waste quantities to the extent required by the online waste levy system (OWLS). Some of these facilities don't have weighbridges in place and instead base their charges on volume estimates. To report to the OWLS, these facilities then need to translate volumes to weights, and it is on this basis that their landfill levy obligations are calculated. Therefore, any variances in conversion rates between volume and weight could result in an over- or under-calculation of the required landfill levy at the gate.

A.4.4 Product Stewardship

Under the Waste Minimisation Act 2008, if the Minister for the Environment declares a product to be a priority product, a product stewardship scheme must be developed and accredited to ensure effective reduction, reuse, recycling or recovery of the product and to manage any environmental harm arising from the product when it becomes waste.⁴⁰

³⁹ <https://www.legislation.govt.nz/regulation/public/2021/0069/latest/whole.html>

⁴⁰ Waste Management Act 2008 2(8)

The following voluntary product stewardship schemes have been accredited by the Minister for the Environment:⁴¹

- Agrecovery rural recycling programme
- Envirocon product stewardship
- Fonterra Milk for Schools Recycling Programme
- Fuji Xerox Zero Landfill Scheme
- Holcim Geocycle Used Oil Recovery Programme (no longer operating)
- Interface ReEntry Programme
- Kimberly Clark NZ’s Envirocomp Product Stewardship Scheme for Sanitary Hygiene Products
- Plasback
- Public Place Recycling Scheme
- Recovering of Oil Saves the Environment (R.O.S.E. NZ)
- Refrigerant recovery scheme
- RE:MOBILE
- Resene PaintWise
- The Glass Packaging Forum

Further details on each of the above schemes are available on:
<http://www.mfe.govt.nz/waste/product-stewardship/accredited-voluntary-schemes>

The first six priority products were named under the WMA in 2020 (shown below) and subsequently single-use packaging has been added. The first seven priority products named are:

1. Plastic packaging
2. Tyres
3. Electrical and electronic products (e-waste including large batteries)
4. Agrichemicals and their containers
5. Refrigerants
6. Farm plastics
7. Single-use plastic packaging

MfE has taken a ‘co-design’ approach, which involves industry developing and operating product stewardship schemes with central government oversight. Progress on the schemes, and parties involved, are summarised below.

Priority product	Progress made	Lead agency/ies
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⁴¹ <http://www.mfe.govt.nz/waste/product-stewardship/accredited-voluntary-schemes>

Tyres	<p>Consultation on proposed regulations late 2021</p> <p>Scheme accredited October 2022</p> <p>Regulation in effect from late 2023</p>	Tyrewise
Large batteries	<p>Consultation on proposed regulations late 2021</p> <p>Accreditation expected late 2023</p> <p>Regulation in effect from 2024</p>	Battery Industry Group
Refrigerants (and other synthetic greenhouse gases)	<p>Consultation on regulations in late 2022</p> <p>Scheme accreditation mid 2023</p> <p>Regulation in effect from 2024</p>	Synthetic Refrigerant Stewardship group
Farm plastics, agrichemicals and containers (farm waste)	<p>Consultation on regulations planned late 2023</p>	The Agrecovery Foundation
Electrical and electronic products (e-waste)	<p>Scheme design in 2023</p> <p>Consultation on regulations in 2024</p>	TechCollect
Plastic packaging	<p>Co-design underway</p>	Packaging Forum and Food & Grocery Council

A.4.5 Waste Minimisation Fund

The Waste Minimisation Fund has been set up by the Ministry for the Environment to help fund waste minimisation projects and to improve New Zealand's waste minimisation performance through:

- Investment in infrastructure;
- Investment in waste minimisation systems; and
- Increasing educational and promotional capacity.

Criteria for the Waste Minimisation Fund have been published:

1. Only waste minimisation projects are eligible for funding. Projects must promote or achieve waste minimisation. Waste minimisation covers the reduction of waste and the

reuse, recycling and recovery of waste and diverted material. The scope of the fund includes educational projects that promote waste minimisation activity.

2. Projects must result in new waste minimisation activity, either by implementing new initiatives or a significant expansion in the scope or coverage of existing activities.
3. Funding is not for the ongoing financial support of existing activities, nor is it for the running costs of the existing activities of organisations, individuals, councils or firms.
4. Projects should be for a discrete timeframe of up to three years, after which the project objectives will have been achieved and, where appropriate, the initiative will become self-funding.
5. Funding can be for operational or capital expenditure required to undertake a project.
6. For projects where alternative, more suitable, Government funding streams are available (such as the Sustainable Management Fund, the Contaminated Sites Remediation Fund, or research funding from the Foundation for Research, Science and Technology), applicants should apply to these funding sources before applying to the Waste Minimisation Fund.
7. The applicant must be a legal entity.
8. The fund will not cover the entire cost of the project. Applicants will need part funding from other sources.
9. The minimum grant for feasibility studies will be \$10,000.00. The minimum grant for other projects will be \$50,000.00.

Application assessment criteria have also been published by the Ministry.

The current funding round opened in October 2022 and will consider applications as they are received, and will agree to fund successful applications until funds are exhausted.

A.4.6 Local Government Act 2002

The Local Government Act 2002 (LGA) provides the general framework and powers under which New Zealand's democratically elected and accountable local authorities operate.

The LGA contains various provisions that may apply to councils when preparing their WMMPs, including consultation and bylaw provisions. For example, Part 6 of the LGA refers to planning and decision-making requirements to promote accountability between local authorities and their communities, and a long-term focus for the decisions and activities of the local authority. This part includes requirements for information to be included in the long-term plan (LTP), including summary information about the WMMP.

More information on the LGA can be found at ww.dia.govt.nz/better-local-government.

A.4.6.1 Section 17A Review

Local authorities are now under an obligation to review the cost-effectiveness of current arrangements for meeting community needs for good quality infrastructure, local public services and local regulation. Where a review is undertaken local authorities must consider options for the governance, funding and delivery of infrastructure, local public services and local regulation that include, but are not limited to:

- a) in-house delivery
- b) delivery by a CCO, whether wholly owned by the local authority, or a CCO where the local authority is a part owner
- c) another local authority
- d) another person or agency (for example central government, a private sector organisation or a community group).

Local authorities had three years from 8 August 2014 to complete the first review of each service i.e. they must have completed a first review of all their services by 7 August 2017 (unless something happened to trigger a review before then).

Other than completion by the above deadline, there are two statutory triggers for a section 17A review:

- The first occurs when a local authority is considering a significant change to a level of service;
- The second occurs where a contract or other binding agreement is within two years of expiration.

Once conducted, a section 17A review has a statutory life of up to six years. Each service must be reviewed at least once every six years unless one of the other events that trigger a review comes into effect.

While the WMMP process is wider in scope – considering all waste service provision in the local authority area – and generally taking a longer term, more strategic approach, there is substantial crossover between the section 17A requirements and those of the WMMP process, in particular in relation to local authority service provision. The S17A review may however take a deeper approach go into more detail in consideration of how services are to be delivered, looking particularly at financial aspects to a level that are not required under the WMMP process.

Because of the level of crossover however it makes sense to undertake the S17A review and the WMMP process in an iterative manner. The WMMP process should set the strategic direction and gather detailed information that can inform both processes. Conversely the consideration of options under the s17A process can inform the content of the WMMP – in particular what is contained in the action plans.

A.4.7 Resource Management Act 1991

The Resource Management Act 1991 (RMA) promotes sustainable management of natural and physical resources. Although it does not specifically define 'waste', the RMA 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 on to 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
- the allocation and use of water.

Under section 31 of the RMA, council 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, noncomplying and prohibited activities, and their controls, are specified in 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 are currently two enacted NESs that directly influence the management of waste in New Zealand:

- 1) The Resource Management (National Environmental Standards for Air Quality) Regulations 2004; 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. 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 operating high-temperature hazardous waste incinerators. These prohibitions aim to protect air quality.
- 2) The Resource Management (National Environmental Standards for Storing Tyres Outdoors) Regulations 2021; this NES provides nationally consistent rules for the responsible storage of tyres.

The implementation of the National Policy Statement for Freshwater Management⁴² may reduce the application rates of some organic wastes to land, which is currently a low cost management option for wastes such as effluent. This may increase the quantities of these organic materials that will be available for processing, which would then impact on the types of materials requiring processing, the technologies best suited to these material mixes, and the markets for the end product.

The RMA is currently subject to extensive reform, which will entail repealing the RMA and replacing it with three separate pieces of legislation:

- 1) National and Built Environments Act;
- 2) Spatial Planning Act; and
- 3) Climate Adaptation Act.

It is likely that this reform process will be completed before the end of 2023.

A.4.8 New Zealand Emissions Trading Scheme

The Climate Change Response Act 2002 and associated regulations is currently the Government's principal response to manage climate change. A key mechanism for this is the New Zealand Emissions Trading Scheme (NZ ETS). The NZ ETS puts a price on greenhouse gas emissions, providing an incentive for people to reduce emissions and plant forests to absorb carbon dioxide.

Certain sectors are required to acquire and surrender emission units to account for their direct greenhouse gas emissions or the emissions associated with their products. Landfills that are subject to the waste disposal levy are required to surrender emission units to cover methane emissions generated from landfill. These disposal facilities are required to report the tonnages landfilled annually to calculate emissions (this is separately to the tonnages required to be reported for the landfill levy, through the OWLS).

The NZ ETS was introduced in 2010 and, from 2013, landfills have been required to surrender 'New Zealand emissions units' or NZUs for each tonne of CO₂ (equivalent) that they produce. Until around 2017, however, the impact of the NZETS on disposal prices was limited. There were a number of reasons for this:

- The global price of carbon crashed during the GFC in 2007-8 and was slow to recover in the following years. Prior to the crash it was trading at around \$20 per tonne. The price had been as low as \$2, although in June 2015, the Government moved to no longer accept international units in NZETS and the NZU price

⁴² <https://environment.govt.nz/publications/national-policy-statement-for-freshwater-management-2020/>

increased markedly. NZUs⁴³ currently change hands for between \$70 and \$85, with prices at \$74.40 at the time of writing⁴⁴.

- The transitional provisions of the Climate Change Response Act, which were extended in 2013 but have now been reviewed, meant that landfills only had to surrender half the number of units they would be required to otherwise. These transitional provisions were removed in January 2017, effectively and immediately doubling the price per tonne impact of the ETS.
- Landfills are allowed to apply for 'a methane capture and destruction unique emissions factor (UEF)'. This means that if landfills have a gas collection system in place and flare or otherwise use the gas (and turn it from methane, CH₄ into carbon dioxide, CO₂) they can reduce their liabilities in proportion to how much gas they capture. Up to 90% capture and destruction is allowed to be claimed under the regulations, with large facilities applying for UEF's at the upper end of the range.

Taken together (a low price of carbon, only two-for-one surrender required, and methane destruction of 80-90%) the actual cost of compliance with the NZETS had been small for most landfills – particularly those that were able to claim high rates of gas capture. Disposal facilities typically imposed charges (in the order of \$5 per tonne) to their customers, but these charges mostly reflected the costs of scheme administration, compliance, and hedging against risk rather than the actual cost of carbon.

The way the scheme has been structured has also resulted in some inconsistencies in the way it is applied – for example class 2-5 landfills and closed landfills do not have any liabilities under the scheme. Further, the default waste composition (rather than a SWAP) can be used to calculate the theoretical gas production, which means landfill owners have an incentive to import biodegradable waste, which then increases gas production which can then be captured and offset against ETS liabilities.

Recently, however the scheme has had a greater impact on the cost of landfilling, and this is expected to continue in the medium term. Many small landfills which do not capture and destroy methane are now beginning to pay a more substantial cost of compliance. The ability of landfills with high rates of gas capture and destruction to buffer the impact of the ETS will mean a widening cost advantage for them relative to those without such ability. This appears to be putting further pressure on small (predominantly Council-owned) facilities and will drive further tonnage towards the large regional facilities (predominantly privately owned).

For example, with a price of carbon at \$75 per tonne, the liability for a landfill without gas capture will be \$68.25 (based on a DEF of 0.91 tonnes of CO₂e per tonne of waste), whereas for a landfill claiming 90% gas capture (the maximum allowed under the scheme), the liability will be only \$6.83. This type of price differential will mean it will

⁴³ NZUs are carbon credits that are officially accepted to offset liabilities under the NZETS

⁴⁴ According to carbon prices on www.carbonforestservices.co.nz and <https://www.carbonmatch.co.nz/>

become increasingly cost competitive to transport waste larger distances to the large regional landfills.

More information is available at www.climatechange.govt.nz/emissions-trading-scheme.

A.4.9 Litter Act 1979

Under the Litter Act⁴⁵ it is an offence for any person or body corporate to deposit or leave litter:

- in or on any public place; or
- in or on any private land without the consent of its occupier.

The Act enables Council to appoint Litter Officers with powers to enforce the provisions of the legislation.

The legislative definition of the term "litter" is wide and includes 'refuse, rubbish, animal remains, glass, metal, garbage, debris, dirt, filth, rubble, ballast, stones, earth, waste matter or other thing of a like nature'.

Any person who commits an offence under the Act is liable to:

- An instant fine of \$400 imposed by the issue of an infringement notice; or a fine not exceeding \$5,000 in the case of an individual or \$20,000 for a body corporate upon conviction in a District Court.
- A term of imprisonment where the litter is of a nature that it may endanger, cause physical injury, disease or infection to any person coming into contact with it.

Under the Litter Act 1979 it is an offence for any person to deposit litter of any kind in a public place, or onto private land without the approval of the owner.

The Litter Act is enforced by territorial authorities, who have the responsibility to monitor litter dumping, act on complaints, and deal with those responsible for litter dumping. Councils reserve the right to prosecute offenders via fines and infringement notices administered by a litter control warden or officer. The maximum fines for littering are \$5,000 for a person and \$20,000 for a corporation.

Council powers under the Litter Act could be used to address illegal dumping issues that may be included in the scope of a council's waste management and minimisation plan.

The Litter Act will be reviewed alongside the Waste Minimisation Act and the current proposal appears to suggest merging the two Acts into one.

⁴⁵ <https://www.legislation.govt.nz/act/public/1979/0041/latest/DLM33082.html>

A.4.10 Health Act 1956

The Health Act 1956 places obligations on TAs to provide sanitary works for the collection and disposal of refuse, for the purpose of public health protection (Part 2 – powers and duties of local authorities, section 25). Where the Ministry of Health considers that a local authority is not taking the necessary action to meet these obligations and protect public health, it can require a local authority to do so.

It specifically identifies certain waste management practices as nuisances (S 29) and offensive trades (Third Schedule) and section 23 directs every local authority to improve, promote, and protect public health by inspecting its district regularly to identify any nuisance or condition likely to be offensive or harm human health. If any issues are noted, the local authority should take steps to rectify the situation. Improperly managed waste would be considered a nuisance. Section 34 enables councils to abate nuisances without notice and recover costs.

Section 54 places restrictions on carrying out an offensive trade and requires that the local authority and medical officer of health must give written consent and can impose conditions on the operation. The local authority's responsibilities under section 54 only applies where resource consent has not been granted under the RMA (i.e., no need to give written consent twice). Local authorities should seek to coordinate with their local public health unit where offensive trades are being established, such as refuse collection and other waste treatment practices.

The Health Act enables TAs to raise loans for certain sanitary works and/or to receive government grants and subsidies, where available.⁴⁶ It also means that where TAs incur costs in meeting their responsibilities to abate nuisances by (for example) removing refuse that is likely to harm public health, the TA can seek payment of these costs.

Health Act provisions to remove refuse by local authorities have been repealed.

A.4.11 Hazardous Substances and New Organisms Act 1996 (HSNO Act)

The HSNO Act addresses the management of substances (including their disposal) that pose a significant risk to the environment and/or human health. 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.

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

⁴⁶ From: MfE 2009: Waste Management and Minimisation Planning, Guidance for Territorial Authorities.

facilities. Hazardous substances commonly managed by TAs include used oil, household chemicals, 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.⁴⁷

A.4.12 Health and Safety at Work Act 201548

The new Health and Safety at Work Act, passed in September 2015 replaces the Health and Safety in Employment Act 1992. The bulk of the Act came into force from 4 April 2016.

The Health and Safety at Work Act introduces the concept of a Person Conducting a Business or Undertaking, known as a PCBU. The Council will have a role to play as a PCBU for waste services and facilities.

The primary duty of care requires all PCBUs to ensure, so far as is reasonably practicable:

- 1) the health and safety of workers employed or engaged or caused to be employed or engaged, by the PCBU or those workers who are influenced or directed by the PCBU (for example workers and contractors).
- 2) that the health and safety of other people is not put at risk from work carried out as part of the conduct of the business or undertaking (for example visitors and customers).

The PCBU's specific obligations, so far as is reasonably practicable:

- providing and maintaining a work environment, plant and systems of work that are without risks to health and safety.
- ensuring the safe use, handling and storage of plant, structures and substances
- providing adequate facilities at work for the welfare of workers, including ensuring access to those facilities.
- providing information, training, instruction or supervision necessary to protect workers and others from risks to their health and safety.
- monitoring the health of workers and the conditions at the workplace for the purpose of preventing illness or injury.

A key feature of the new legislation is that cost should no longer be a major consideration in determining the safest course of action that must be taken.

⁴⁷ From: MfE 2009: Waste Management and Minimisation Planning, Guidance for Territorial Authorities.

⁴⁸ <http://www.legislation.govt.nz/act/public/2015/0070/latest/DLM5976660.html#DLM6564701>

WorkSafe NZ is New Zealand's workplace health and safety regulator. WorkSafe NZ will provide further guidance on the new Act after it is passed.

A.4.13 Other legislation

Other legislation that relates to waste management and/or reduction of harm, or improved resource efficiency from waste products includes:

- Biosecurity Act 1993
- Radiation Protection Act 1965
- Ozone Layer Protection Act 1996
- Agricultural Chemicals and Veterinary Medicines Act 1997.

For full text copies of the legislation listed above see www.legislation.govt.nz.

A.4.14 International commitments

New Zealand is party to international agreements that have an influence on the requirements of our domestic legislation for waste minimisation and disposal. Some key agreements are the:

- Montreal Protocol
- Basel Convention
- Stockholm Convention
- Waigani Convention
- Minamata Convention.

More information on these international agreements can be found on the Ministry's website at www.mfe.govt.nz/more/international-environmental-agreements.

A.5.0 A Circular Resource Recovery Network

Historically, our economic system has operated primarily on the basis of linear processes. This system involves extraction, processing, manufacturing, consumption and disposal (end-of-life). This system is not sustainable as it involves systematically using up non-renewable raw materials (such as minerals and fossil fuels) and degrading the natural environment, which is necessary to support life, through unsustainable agricultural and extractive activities (such as logging of native forests), and the creation of waste and pollution.

To address this, a paradigm shift is needed. This requires a change in how the economic system produces, assembles, sells, and uses products to minimise waste and maximise the value of materials in use. The circular economy is a model that enables resources to be kept in use for as long as possible, extract maximum value from them, and then recover and regenerate materials at end-of-life.

Within the context of enabling a circular economy, it is proposed to re-organise how the recovery of materials in the economy occurs by establish a **‘circular resource network’**.

The key organising principle behind the concept of a circular resource network is that the resource recovery system should be consciously designed to facilitate the circular flow of materials through the economy, by ‘completing the circle’. To date, the ‘reverse logistics’ aspect of the economy that is responsible for collecting widely dispersed and mixed materials has been a poor relation to the ‘logistics’ part of the economy that is responsible for the dispersion.

The following subsections expand on what a circular resource network concept that is designed for the circular economy could entail. The circular resource network concept borrows from and builds on the existing concept of a resource recovery network (RRN).

A.5.1 Conventional Resource Recovery Network (RRN)

The concept of a RRN is a longstanding one with various examples including Auckland Council working to develop a network of community run facilities in partnership with the Zero Waste Network⁴⁹, the development of a Māori and Pasifika Eco Park, in South Auckland⁵⁰, and Selwyn District Council recently announcing their resource recovery park concept⁵¹.

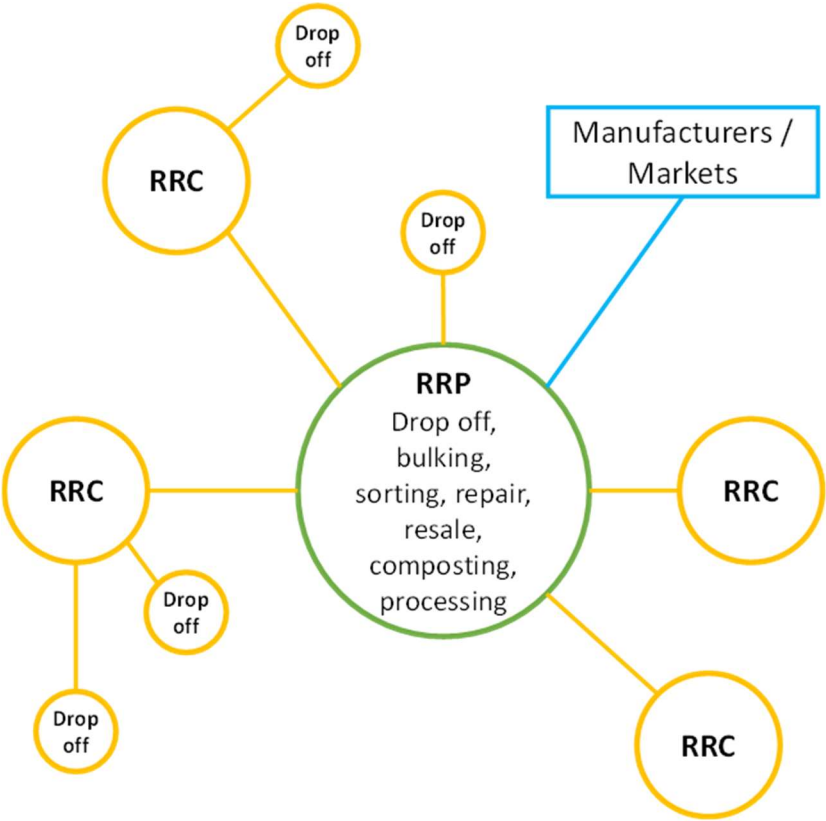
⁴⁹ <https://www.makethemostofwaste.co.nz/resource-recovery-network/>

⁵⁰ <https://www.stuff.co.nz/business/126810349/the-1-billion-plan-to-lift-mori-and-pasifika-prosperity-in-aucklands-south-and-west>

⁵¹ <https://www.selwyn.govt.nz/services/rubbish,-recycling-And-organics/recovery-park/reconnect-project>

These examples (which have different approaches) can be expanded into a nationwide state of the art network of resource recovery parks (RRPs) which consist of linked (sub) regional hubs, with smaller satellite facilities (resource recovery centres or RRCs) feeding recovered materials into the hub for processing and sale. These potentially can be further supplemented by local drop off sites that feed the satellite facilities. This concept is illustrated in the figure below.

Figure 17: Network of Resource Recovery Centres Linked to Resource Recovery Parks



The functions that are performed by the RRP consolidate a range of resource recovery functions into a single site. The intent is both to provide a ‘one stop shop’, but also to take advantage of economies of scale and sharing of infrastructure, services, and overheads, and optimising transport of materials to reduce costs. Furthermore, by co-locating functions there can arise the possibility of synergies between the different functions. For example, reclaimed timber and building materials can provide materials for a ‘Community Shed’ type operation⁵², or items salvaged from the waste stream can be sold at low cost to the public. The proposed form of a resource recovery network is

⁵² <https://menzshed.org.nz/about-us/what-is-a-shed/>

to have a series of sites with physically co-located functions, and for these to be operated by or overseen by a single entity.

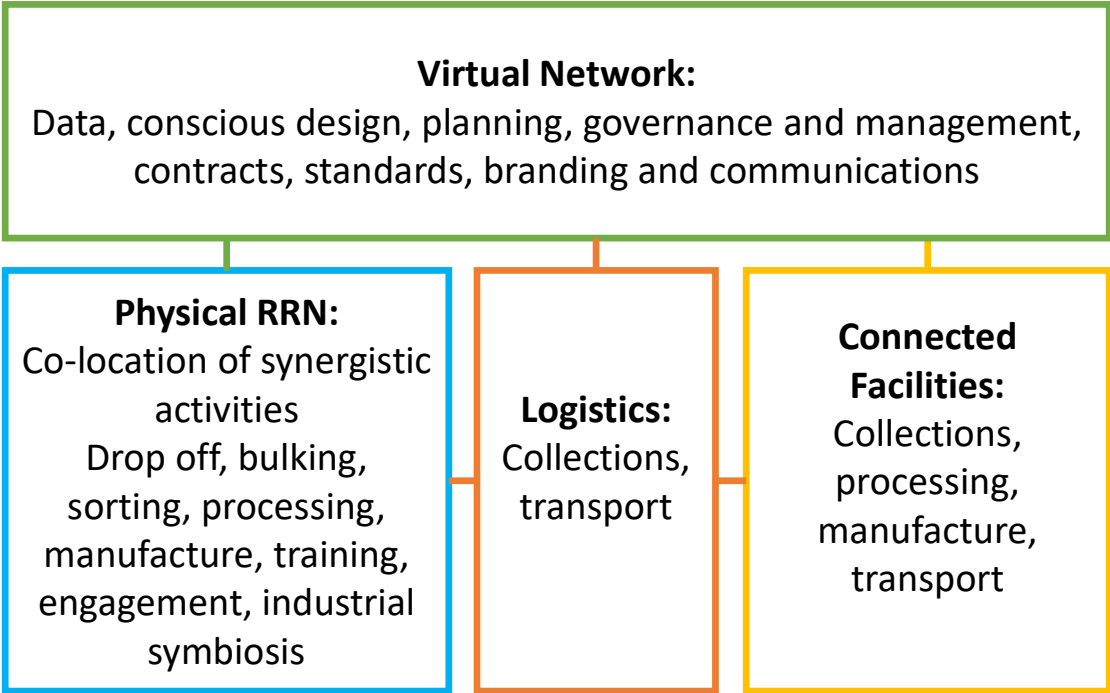
A.5.2 Expanding the Resource Recovery Network

While the conventional concept of a resource recovery network has much to recommend it, in our view there is potential to evolve it further to create the core functionality needed to enable the circular economy.

It is proposed to evolve the concept of physical co-location of synergistic activities to encompass a virtual and holistic network of sites, some co-located (where this provides efficiency gains, and is practical), but also including other sites that may be physically stand-alone sites, but which are connected to the circular resource network. The method of connection would be through supplying and receiving material, utilising network transport arrangements, operating to agreed performance standards, utilising standardised signage and specifications, providing and receiving data, and being linked through virtual directories.

A physical network of sites and logistic can be replicated virtually in an information management system. A nation-wide virtual circular resource network could, eventually, track and/or manage the flow of materials through the entire resource recovery sector in Aotearoa, and enable the optimisation of infrastructure, logistics, and services. Underpinning the virtual network is a physical network of sites and facilities that operate to agreed standards (akin to the traditional RRN concept), supplemented by standalone sites that are connected to the network. Connecting the physical network and standalone sites is a highly efficient, flexible, and low-carbon logistics network. The high-level structure of the network is illustrated in the figure below:

Figure 18: Circular Recovery Aotearoa High-Level Structure



A.5.2.1 Spatial Representation

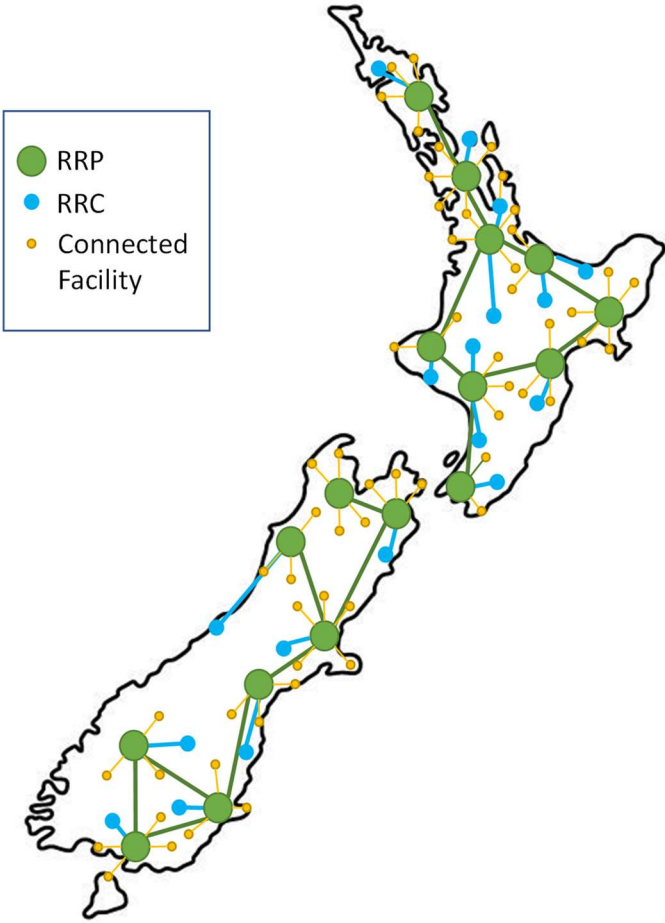
Figure 19 below shows a high-level visual representation of a national resource recovery network.

The large green dots represent regional RRs that consolidate and process material at a regional level. Depending on the material stream, materials could also be transported between the regional hubs (for example glass being consolidated in Christchurch for shipping to Auckland for manufacture). Regional hubs could also specialise in processing certain materials and swap materials accordingly.

The mid-sized blue dots represent local RRs that accept a full range of materials and send to the regional RRs for bulking (or to ‘connected facilities’ for local processing). Not shown are smaller drop-off sites.

The small yellow dots represent the potentially hundreds of facilities that are not co-located at an RR or RR but are linked and operate to the standards of the network. These facilities could accept materials from the RR or RR for processing, or supply materials to these sites.

Figure 19: Concept Map of Circular Resource Network

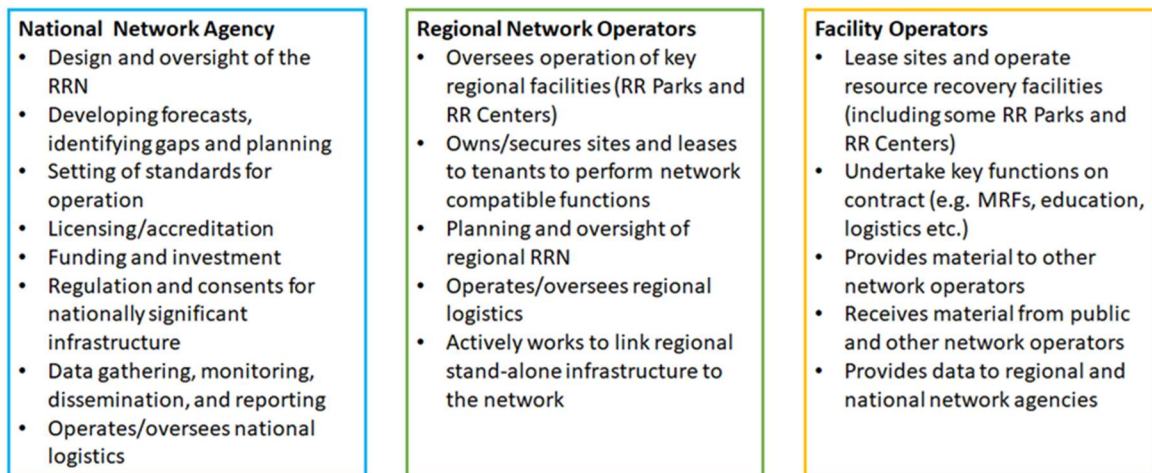


A.5.2.2 Virtual Network

The core of the concept is that the reverse logistics system is actively planned and optimised to ‘close the circle’ and enable a circular economy. This requires planning, analysis, and data gathering and analysis functions, alongside the active ongoing management of material flows. This is what is covered by the ‘virtual network’ element.

The roles of the key organisations involved in the circular resource network are shown in the figure below:

Figure 20: Key Agents and Roles in the Resource Recovery Network



A digital model could be developed of the key material flows within the resource recovery sector (ideally this would ultimately encompass a mass balance of materials through the economy, although this is likely to be more difficult to achieve and therefore a more long-term aspiration).

By digitally mapping material flows nationally, across both core facilities and connected facilities, potential gaps and issues could be quickly identified and planning undertaken to ensure the system remains optimised and is resilient and adaptive in the face of change.

The digital model would include current material flows and allow for projections and modelling of new facilities, changes to material types and quantities, logistics etc. This would enable the potential impact of new facilities and options to be investigated before implementation.

The core of the circular resource network is the establishment of a set of standards of operation that all facilities that form part of the circular resource network operate to. These standards would apply to both operations co-located at an RRP or RRC, as well as connected facilities. In this regard what is proposed is similar to a franchise model: as well as designing the overall system the government (or its agents) set the basis by which the circular resource network would function.

A.5.2.3 Physical RRN – Structure

The ‘Physical RRN’ is the aspect of the system that is most recognisable interface of the network. A national network could be made up of regional nodes (circular resource networks) that are linked but that can operate as independent regional entities.⁵³ This

⁵³ For the purposes of this exercise, it should be assumed that ‘regional’ broadly corresponds to current regional council and unitary council boundaries.

would enable planning with a national perspective (as noted above) but empower the governance and management at a regional level to enable agile response to regional and local requirements. It should be noted, however, that there could be a number of different models.

The role at a regional level is primarily:

- Site ownership, management, development, and leasing.
- Operating region-wide logistics to consolidate materials from RRCs and Connected Facilities at the regional RRP for bulking, sorting, processing and bulk transport or local manufacture.
- Overseeing and applying the operating standards for the network.
- Advocating for the development of the network and working with operators and stakeholders to facilitate its continued development.
- Promotion and communication with users.

Regional networks would operate to national standards that include the following (as noted above):

- Branding and communications.
- Core materials accepted and material acceptance criteria.
- Output material quality standards and contamination levels (referencing existing market specifications or official standards where appropriate).
- Customer service levels.
- Appropriate employment conditions.
- Standard contracts and agreements for supply of services, provision or sale of materials, leases etc.
- Access to and participation in online marketplaces for recovered materials generated by network participants.

The regional network operators in turn would be responsible for applying and enforcing these standards for local and connected facilities.

A.5.2.4 RRP – Regional Hubs

The heart of a regional network consists of one or two large RRPs, where a range of key functions are co-located. The purpose of the RRP is to provide a 'hub' for the efficient regional consolidation of a wide range of materials collected at the RRC and Connected Facilities, as well as those that may be collected at the RRP itself.

The core of the concept is to have regional consolidation of materials and provide a hub for the regional network. In addition, these sites could provide a 'flagship' centre with a full range of services for drop-off and community engagement etc.

The RRP all can have different mixes of facilities depending on local requirements. The logistics and flagship public facing operations could be co-located or at different sites depending on local situations.

Typical facilities may include:

- Material recovery facilities for sorting of collected comingled materials.
- Anaerobic digestion facilities to process putrescible wastes and generate biogas that is used to fuel the regional logistics collection fleet.
- Logistics sorting centre for managing the inputs and outputs of a range of facilities.
- Construction and demolition waste sorting facility.
- Wash plants and fleet management facilities for reusable containers.
- Regional consolidation and logistics for a range of product stewardship schemes such as:
 - E-waste dismantling and processing operations.
 - Used large battery (EV and stationary storage) assessment and consolidation centres.
 - Farm plastics and agrichemical containers.
 - Tyres.
 - Mattresses.
- Education centre.
- Reuse stores/mall.
- Food rescue.
- Manufacturing businesses utilising recovered materials. In some instances, these businesses are co-located to utilise others' discarded materials and surplus process heat, with ongoing work to develop industrial symbiosis models.
- Research on material reuse/recovery.
- Drop off facilities for a full range of materials.

A.5.2.5 Local RR Centres

While the RRP are the hub of the regional networks, the RRC form the primary nodes where the majority of material is dropped off and consolidated locally. Many RRCs will start off as local transfer station sites that are upgraded and re-purposed to have a predominant focus on resource recovery. The RRCs are the local centre for community activity, with many run by community enterprises or iwi, and serve to engage, educate and empower the local communities to not only recover materials but extract and apply the value of those materials for community benefit.

There are a range of different services and facilities at each site, but a set of core facilities could include the following:

- Drop off facilities for a standard range of materials (nominally as follows):
 - Cardboard
 - Metals
 - Paper
 - Glass
 - Plastics 1,2,5
 - Shrink-wrap
 - Garden waste
 - DIY construction and demolition waste
- Dropoff/consolidation sites for current and future product stewardship schemes, for example:
 - Reusable containers
 - Single use containers
 - E-waste and batteries
 - Farm plastics and chemical containers
 - Tyres
 - Mattresses
 - Textiles
 - Paint and household chemicals
- Reuse drop off, refurbishment and resale (furniture, household items, furnishings and clothing, toys, books, tools).

Optional services and facilities could include:

- Café
- Construction and bulky materials sales yard
- Education, training
- Workshops/refurbishment
- Food rescue
- Cooking oil – biodiesel/soap manufacture
- Reusable nappies
- Mattress recycling
- Business incubator space

A.5.2.6 Logistics

A core feature of the concept is the establishment of an efficient logistics network that is able to consolidate and transport materials as efficiently as possible, including utilising

back-loading, bulk transport, and using flexible methodologies to facilitate bulk transport of smaller volume materials (for example, modular bins transported on side loaders).

Vehicles utilised by the network could take advantage of low-carbon and waste-based technologies to minimise the carbon footprint of materials managed by the network. For example:

- Vehicles could be powered by gas/energy generated from anaerobic digestion of organic waste.
- Battery electric vehicles could utilise second-life batteries or charging infrastructure built using second life batteries.
- Bulk transport using rail (ideally electrified).

Materials are dealt with in the most appropriate manner through the network with some materials managed locally or regionally, and other materials utilising the logistics capabilities of the network to be delivered to national end uses at low cost.

The figure below illustrates how certain materials are likely to be managed locally, regionally, nationally, or internationally.

Figure 21: Geographical Circulation of Material Types



In the above indicative representation, organics (such as garden waste), reusables, and repairable items are likely to be utilised in local communities; refillables, organics that require more capital intensive processes (such as food waste or sludges), construction and demolition waste, and e-waste dismantling are likely to be undertaken on a regional level; processing and manufacture of products from glass, paper, plastic, metal, e-waste,

and tyres are likely to be processed at national or sub-national scale facilities. Finally, there will be a range of materials that are sold into international commodity markets. These are likely to include paper, plastics, metals, e-waste, and textiles.

The above is intended purely for the purposes of illustration – as markets, material types, and processing technologies evolve these circles of re-integration into the economy are likely to change. The key point is that the network will involve a redistribution of different products and materials to different points and designing this redistribution to be as efficient and effective as possible will be critical to the functioning of the circular economy.

Local Logistics

A key part of the concept is to facilitate the ability to capture the widest possible range of materials by taking advantage of economies of scale to capture economic quantities. This can be achieved through a standardised modular approach to material separation and collection. An example of this is the system deployed in Upper Austria, which utilised 1 cubic metre stackable bins that can be moved using forklifts and transported on curtainsider trucks (see below).

Figure 22: Standardised Bins Being Loaded onto Curtainsider Truck



The system collects 80 different types of separated material. The possible downside of it taking time to gather economic quantities of less common material types is minimised as

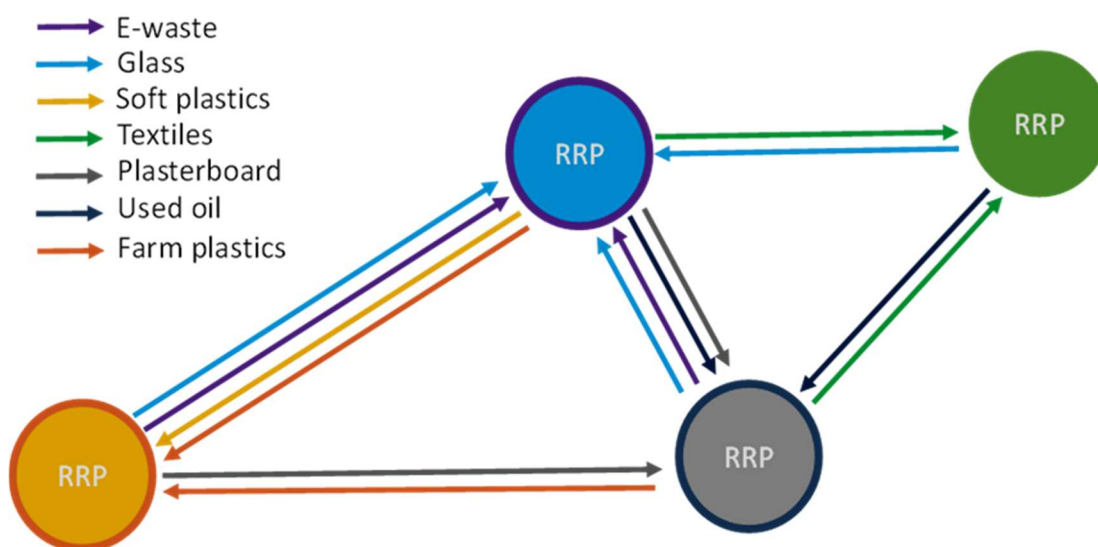
economic quantities can be achieved across the whole region, and the systems components are low cost and have proven efficiency.

The use of the same bins the same types of materials and common signage provides standardisation across the network, despite a wide range of operators being responsible for the individual resource recovery sites.

Inter-Regional Logistics

There is also potential to optimise the flows of materials between regional/sub regional hubs. For example, each regional hub could specialise in processing of one or more material types, with flows of materials then able to be balanced between sites, optimising logistics through backloading, as well as creating economies of scale. A hypothetical illustration is provided in the figure below.

Figure 23: Inter-Regional Logistics Model

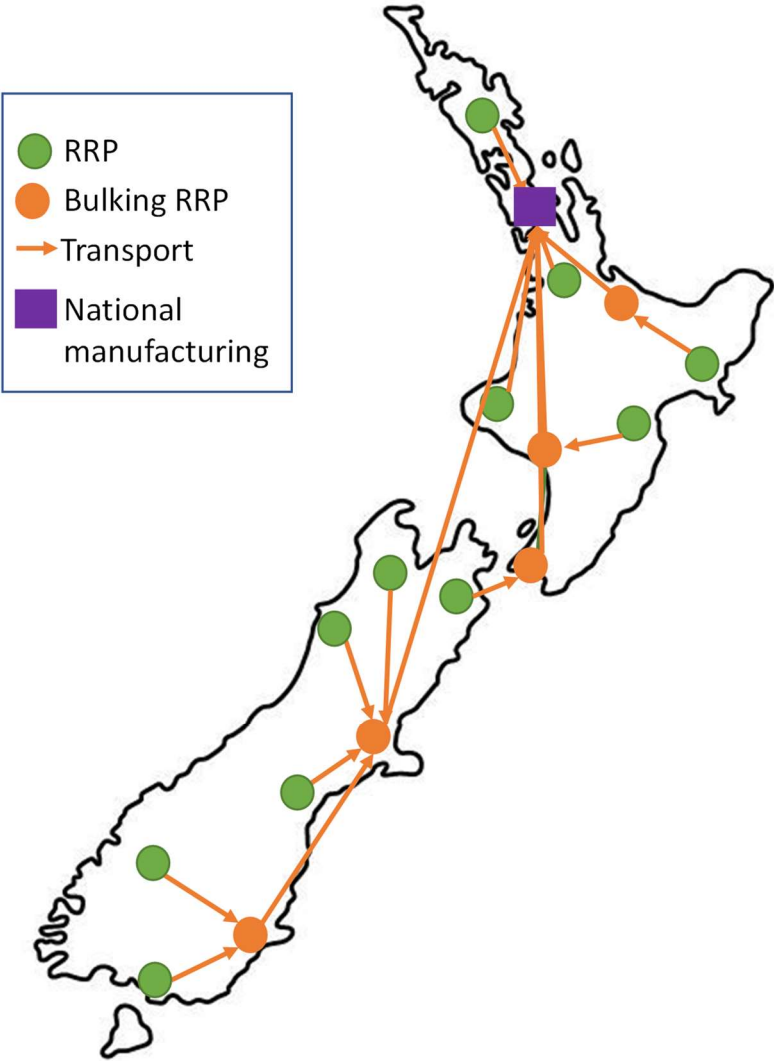


In the above hypothetical illustration, the blue RRP processes e-waste and glass from other proximate RRP, while sending other materials such as soft plastics, farm plastics, textiles, plasterboard and used oil to other proximate RRP. This is repeated across the RRP, so that the quantities and movements of material are approximately balanced. The location of specialised processing and balancing of logistics would be part of the design and planning role of the national level ‘virtual network’.

National Logistics

In addition to the local and inter-regional flows of materials, a range of materials handled by the network would need to go to national scale processing/manufacturing facilities (e.g. glass, paper, plastics). Logistics across the network could be optimised to take advantage of bulk transport through strategic bulking points, and there is even the possibility of constructing new national scale facilities in locations to balance national materials flows. The figure below illustrates how materials could be consolidated through regional networks to key bulking points for long-haul transport.

Figure 24: National Logistics Illustration



A.5.2.7 The Role of Local/Regional Government

Local government has historically had a major role in waste management planning and service delivery, and this is likely and desirable to continue. Local government own a significant proportion of the existing transfer station sites, and well as processing infrastructure sites and are familiar with local circumstances. Many councils are already in the process of developing resource recovery parks or local networks.

These existing and planned sites could form a starting point for the physical circular resource network. It would primarily be a matter of collaborating to establish consistency and linkages across the existing and planned sites as well as promoting the development of new sites by local government.

In addition, there may be a vital role for regional entities. One of the key issues identified in the stocktake work was a lack of appropriate delivery structures for regional level infrastructure. Some facilities require a regional level approach to achieve appropriate economies of scale (for example processing of food waste, MRFs, regional bulking for key materials such as glass etc.).

The proposed circular resource network concept is centred around a regional approach, with one or two regional scale RRP that form the core hubs for collecting and consolidating material from the RRC sites, and undertaking processing and, potentially, manufacture. Key aspects of the roles for regional and local government could include:

- Service operation/contracting
- Local and regional expertise and coordination
- Local infrastructure investment and operation
- Identification and provision of appropriate sites
- Local consents monitoring, and enforcement
- Gathering and analysis of data

A.5.2.8 The Role of Iwi

Iwi also have an important role to play in the co-development of the circular resource network. The concept of resource recovery is aligned with the te ao Māori principle of kaitiakitanga, and the Para Kore programme is already in place in 476 marae across the country⁵⁴.

In addition to performing a similar role to the private and community sectors in service delivery, iwi have a role as kaitiaki of the land and people, and where resources are available, iwi can contribute financial investment and sites to the network and provide

⁵⁴ <https://www.parakore.maori.nz/our-story/>

leadership in the development of the network. Key aspects of the roles for iwi could include:

- Service operations
- Infrastructure investment and operation
- Guardians / developers of RR Park and RR Centre sites
- Recovering value from materials
- Ownership and sale of recovered materials
- Utilising recovered value to leverage other community outcomes (e.g. employment, training, rehabilitation)

A.5.2.9 The Role of Private Sector Operators

Private sector operators currently manage the vast majority of waste materials recovered and disposed of in NZ, whether via private commercial arrangements or under contract to the public sector, and this would be expected to continue under the proposed model.

The expectation is that, for the operation of the physical circular resource network, the public sector would generally own the land and generic infrastructure (such as buildings or, concrete pads, roading etc.) but would lease the sites or contract out for the delivery and operation of the circular resource network sites (such as separation of materials, composting, processing, manufacture).

Sites could have a range of private and community sector operators involved (see below). Key aspects of the roles for private sector operators could include:

- Service operations
- Infrastructure investment and operation (either privately or under contract)
- Recovering value from materials (including repair and reuse)
- Ownership and sale of recovered materials

A.5.2.10 The Role of the Community Sector

Although the community sector is a minor player in terms of the total quantity of waste materials managed in New Zealand, they have had a significant role in the industry in terms of community engagement, innovating around recovery, and extracting value from waste materials to apply to social and community outcomes.

The community sector role can potentially be further embedded and given added importance in the delivery of the circular resource network concept. Community groups could not only provide services such as reuse and repair across multiple sites but could

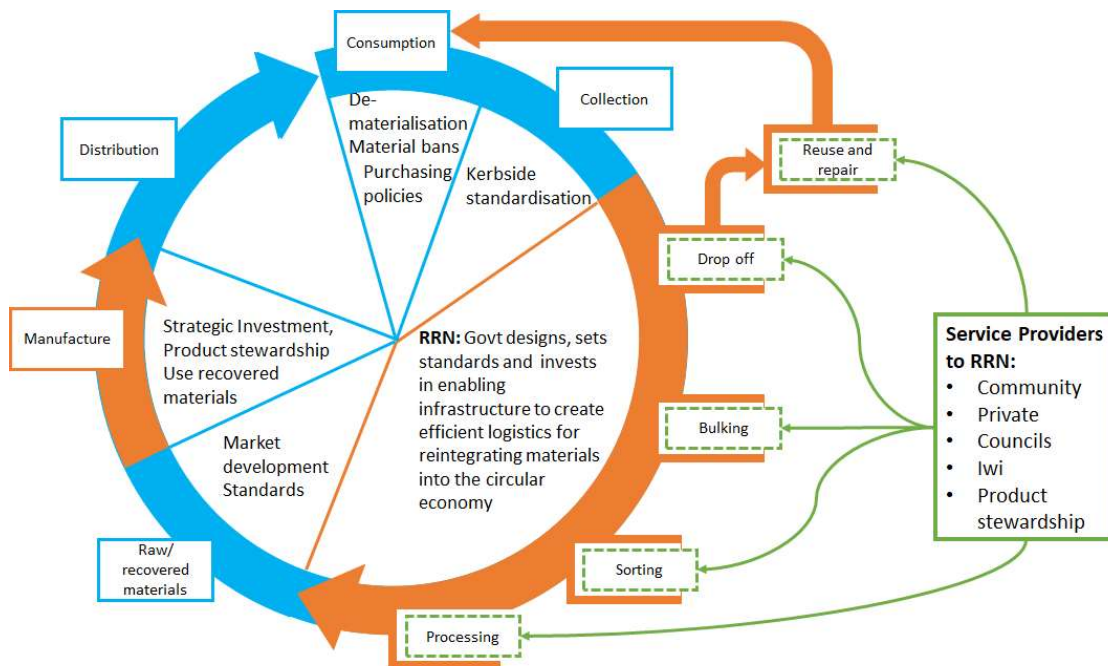
also be empowered to deliver all services on sites (as has been demonstrated in Auckland). Key aspects of the roles for community sector operators could include:

- Service operations
- Infrastructure operation
- Recovering value from materials (including repair and reuse)
- Ownership and sale of recovered materials
- Utilising recovered value to leverage other community outcomes (e.g. employment, training, rehabilitation)

A.5.2.11 Summary

The figure below illustrates how the roles and functions of a national resource recovery network could integrate to provide key reverse logistics functions in the circular economy. The orange elements of the circle are the parts that form the circular resource network.

Figure 25: Roles and Functions of a Circular Recovery Network in the Circular Economy



In the above chart material flows around in a clockwise direction. The arrows represent the material flows. The boxes indicate the key steps within the value chain. The graphic shows how different providers to the can deliver all of the key functions, but within an overall connected framework (that is established and overseen by central/regional/local government).

A.5.3 Benefits of Circular Resource Network Approach

A Circular Resource Network approach would have a range of benefits. These include:

- **Consistent with the Waste Strategy.** At its core the approach is about enabling the circular economy by building out the infrastructure required for the circular flow of materials in the economy. The circular resource network concept synthesises this into a practical approach with wide ranging applications.
- **A practical, easily articulated, investment strategy.** Because the core component of the circular resource network concept is an arrangement of physical infrastructure it is intuitively easy to communicate the intent.
- **Improved efficiency and value.** By focusing on how value can be preserved and enhanced through the resource recovery value chain rather than purely on environmental and social outcomes, it is possible to unlock the potential value of recovered materials and unleash the innovative power of the sector to achieve environmental and social outcomes.
- **Future flexibility.** Flows of materials will change over time. By government investing in the skeleton structures that enable functions, then investment is not locked into a time-limited solution. As materials, markets and processes change over time existing

infrastructure and governance can be efficiently and nationally adapted for the new functions.

- **Data harvesting.** The development of the digital model circular resource network will enable an unprecedented level of insight into recovered material flows and enable effective and intelligent planning and nimble responses by the sector to evolving situations.
- **Baskets of materials.** By co-locating and handling of a range of material and product types at single locations this enables efficiencies through the sharing of support structures and cross subsidisation, and hence the viable recovery of a wider range of materials.
- **Builds on existing infrastructure.** As noted, existing infrastructure (such as existing and planned RR Parks, and transfer stations) would form the foundation of the circular resource network, and these could be progressively integrated.
- **Provides valuable roles for all stakeholders.** The circular resource network will be significant in scale and scope, and it will require the input, collaboration, innovation, and power of all parts of the sector to fully realise its' potential.
- **'No regrets' approach.** The circular resource network concept proposed here is potentially far reaching in its scope and what it could eventually encompass. However, whatever level the concept is implemented to, it will still have multiple benefits. At a minimum it would result in the creation of a number of RR Parks or regional circular resource networks, which will still be positive outcomes.
- **Scalability.** The network can be "right"-sized in a flexible manner with the ability to effectively respond to changing circumstances.