Waikato Regional Council Technical Report Current 2022/11

Waikato and Bay of Plenty region waste and recycling stocktake 2021

www.waikatoregion.govt.nz
ISSN 2230-4363 (Online)

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August 2022

Document #: 23542518

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Date May 2022

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Date August 2022

Disclaimer

EXECUTIVE SUMMARY

WAIKATO AND BAY OF PLENTY WASTE AND RECYCLING STOCKTAKE 2021

BAY OF PLENTY REGIONAL COUNCIL
TOI MOANA

Waikato
REGIONAL COUNCIL
Te Kaunihera ā Rohe o Waikato

Overall waste to Class 1 landfills

Quantities reported are from disparate time periods*
and include special wastes

Bay of Plenty region		Waikato region
36%		64%
174,495 Tonnes per annum	+	308,885 Tonnes per annum

483,380 Tonnes per annum

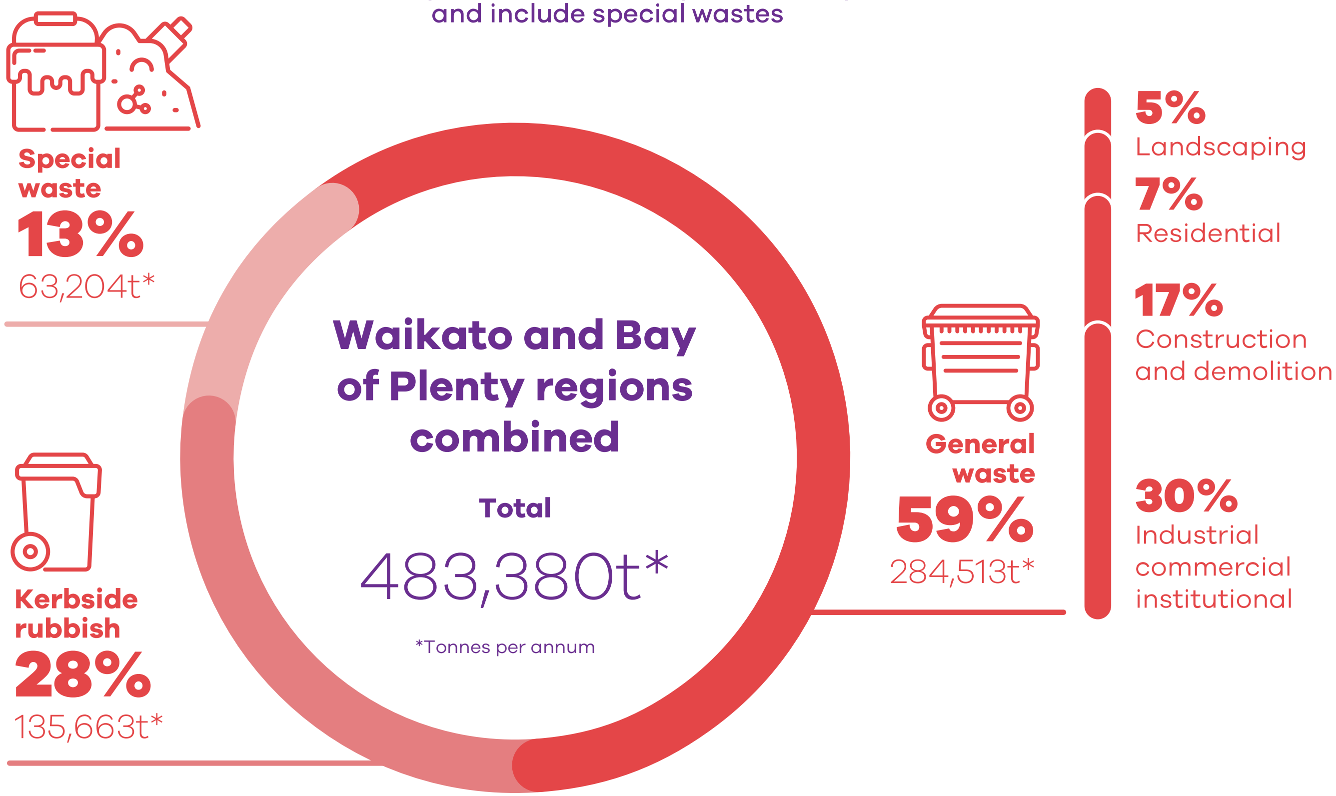
*The most recent 2020 data was used where available but some data was before 2020.

The Waikato and Bay of Plenty Regions send a combined total of 483,380 tonnes of waste to landfill per year.

The main sources of waste in the regions are from kerbside, industrial, commercial and institutional sources and construction and demolition.

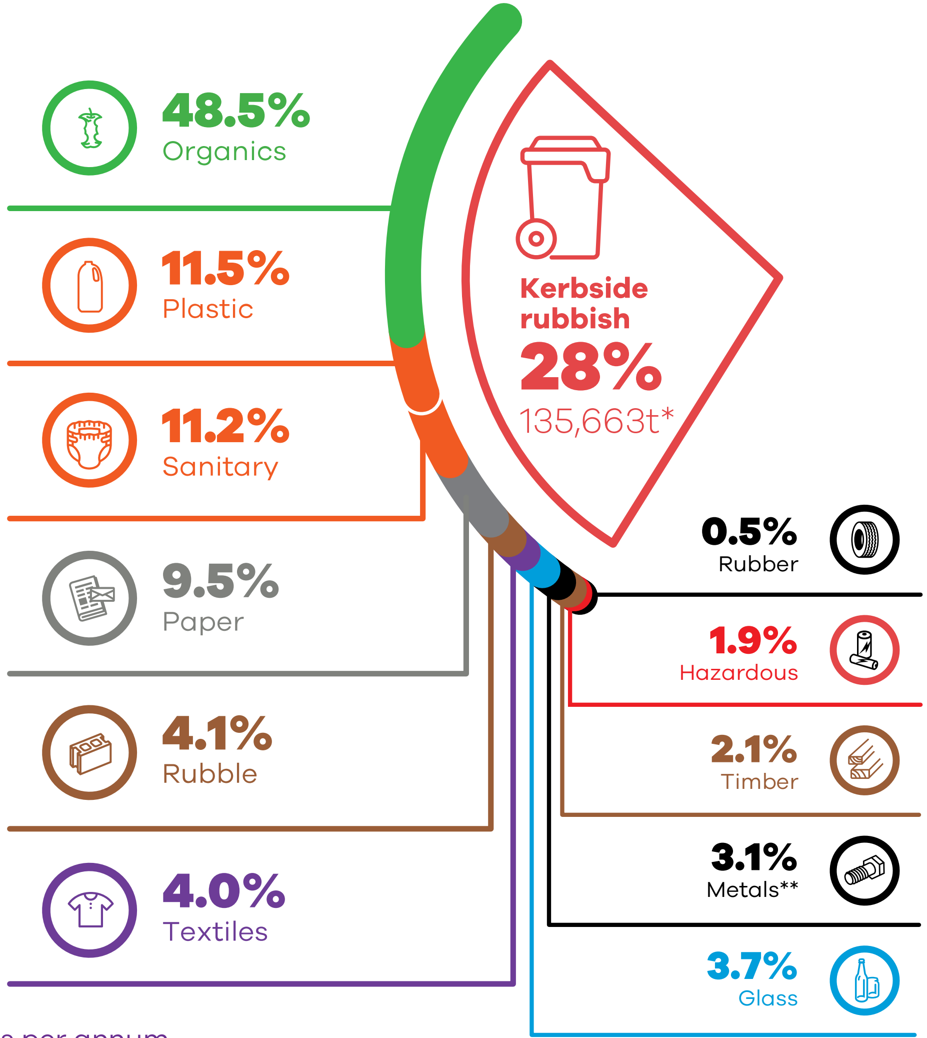
Activity sources of waste to Class 1 landfills

Quantities reported are from disparate time periods* and include special wastes



*The most recent 2020 data was used where available but some data was before 2020.

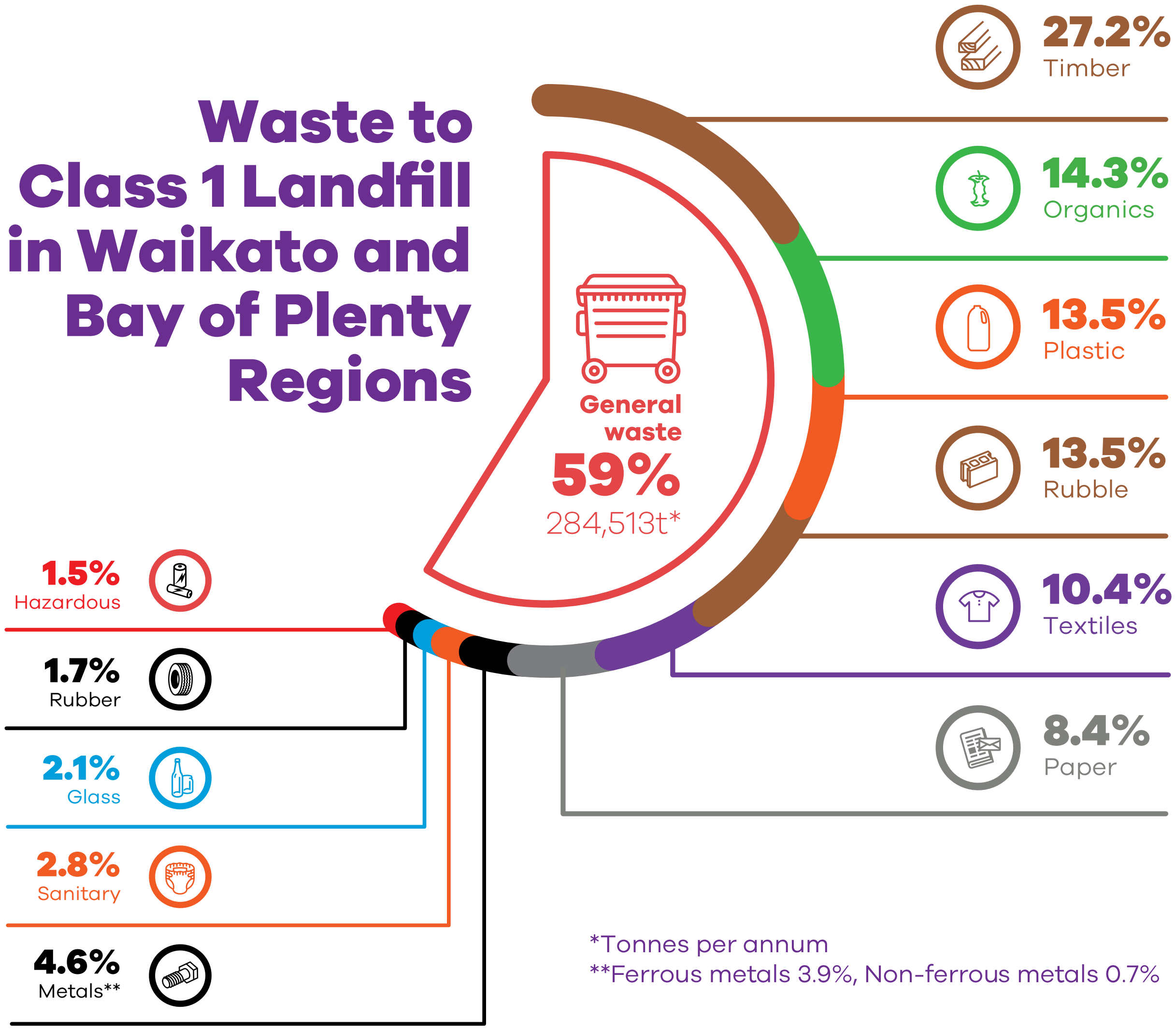
Primary composition of kerbside rubbish from both regions - 2020



*Tonnes per annum
**Ferrous metals 2.0%, Non-ferrous metals 1.1%

The highest volume of waste in kerbside collections is organic.

Waste to Class 1 Landfill in Waikato and Bay of Plenty Regions

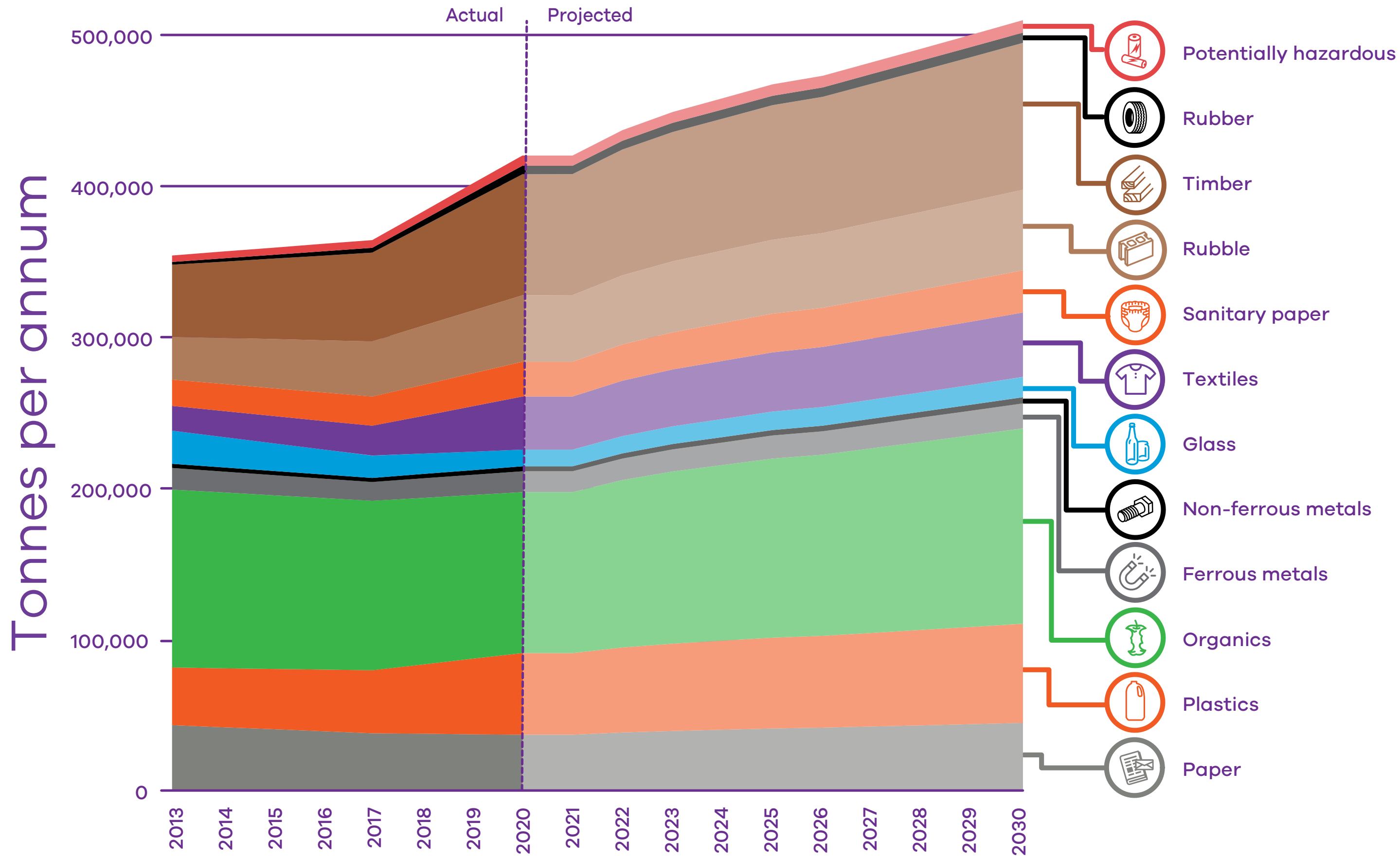


*Tonnes per annum
**Ferrous metals 3.9%, Non-ferrous metals 0.7%

Of the general waste that is going to landfill (excluding kerbside collections), the highest volumes are from timber, organics and plastics and rubble.

If nothing is done, waste to landfill is estimated to increase to over 500,000 tonnes by 2030

Historical and Projected Quantities of Overall Waste to Landfill to 2030 by Composition, Waikato and Bay of Plenty regions combined



We could reduce waste by 41% if we removed everything that was divertible or recyclable. This would mean an almost 50% reduction in emissions from landfill, not including the emissions created from transporting waste.

tCO_2-e unit emissions from waste to Class 1 landfills

483,380t
to Class 1 landfills
x
1.286*
Calculated emission factor /t of waste
=
621,619*
Emissions potential before landfill gas capture
x.27=
167,444*
Actual emissions after 73% landfill gas capture

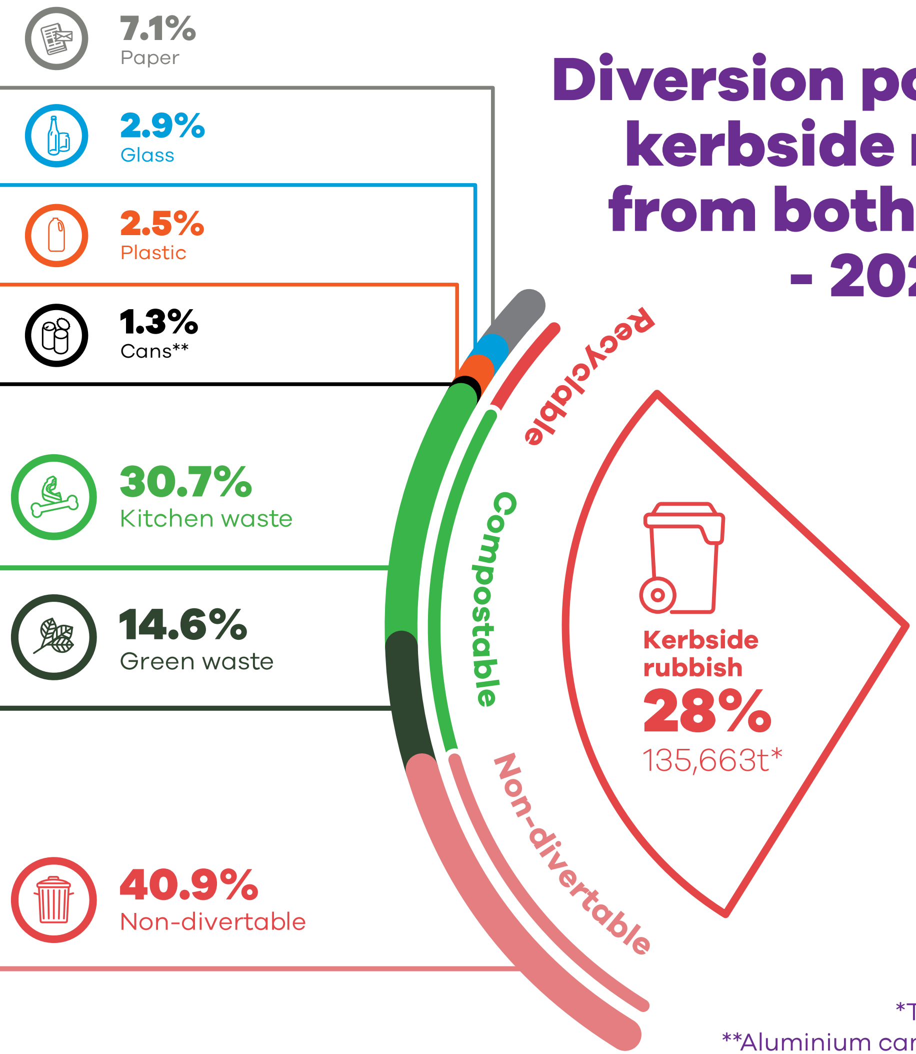
284,216t
after removal of divertable material
x
1.135*
Calculated emission factor /t of waste
=
322,684*
Emissions potential before landfill gas capture
x.27=
86,921*
Actual emissions after 73% landfill gas capture

*tonnes of CO2 equivalent

Due to rounding, performing the calculations given in the equations may not return the exact results shown.

There is huge opportunity to prevent and reduce waste going to landfill. This stocktake estimates that 59.1% (80,138 tonnes per annum) of what is currently going to landfill from kerbside collection could be diverted.

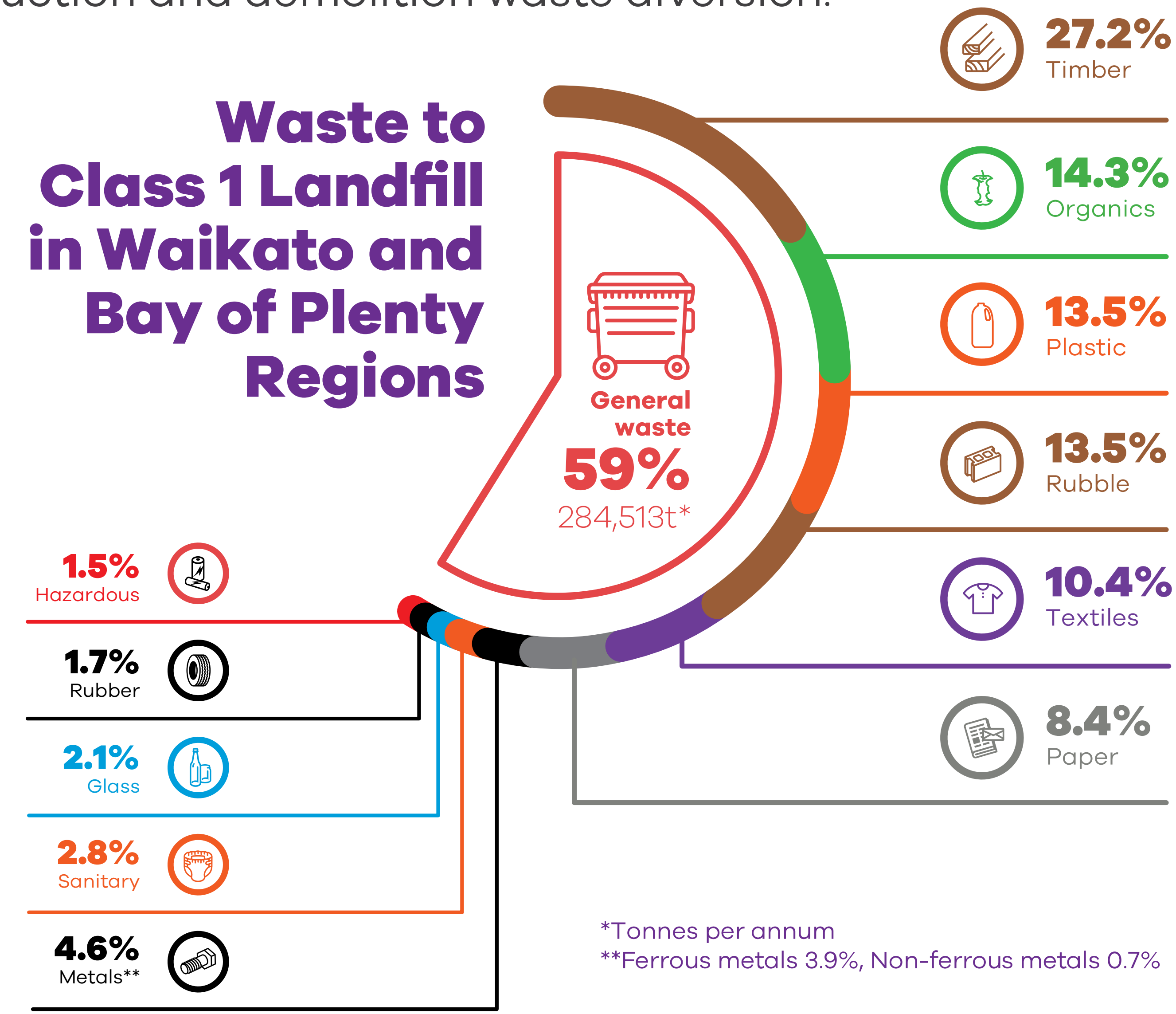
Diversion potential of kerbside rubbish from both regions - 2020



*Tonnes per annum
**Aluminium cans 0.4%, cans 0.9%

An estimated 40.6% of general waste is divertible. This includes plasterboard and timber, showing there are gains to be made in construction and demolition waste diversion.

Waste to Class 1 Landfill in Waikato and Bay of Plenty Regions



*Tonnes per annum
**Ferrous metals 3.9%, Non-ferrous metals 0.7%

Preventing or reducing waste will:

- conserve resources
- extend the life of current landfills and reduce the need for future landfill sites
- secure a safe environmental future for the next generations

In addition, resource recovery and the reuse sector have the potential to create job and business opportunities.

Good work is already being done to reduce and prevent waste in our regions. There are growing reusable and refillable packaging options across the regions.

Resource recovery is also growing and sharing economies and the secondhand market are strong. Existing and future prevention and diversion actions should be supported to achieve both waste and emissions reductions.

Bridget, Ngatiriti, Harina and Claudine volunteering to reduce waste at the Waikato Tainui Games for Para Kore Marae Inc

Waikato and Bay of Plenty Regional Waste and Recycling Stocktake 2021

Prepared for Waikato and Bay of Plenty Regional Councils

August 2021

Prepared for

Prepared in partnership with

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DOCUMENT QUALITY CONTROL

Date	Status	Distributed to
4 June 2021	Draft 0.1	Valerie Bianchi and Reece Irving
8 June 2021	Draft 0.2	Valerie Bianchi and Reece Irving
16 July 2021	Draft 0.3	Valerie Bianchi and Reece Irving
6 August 2021	Draft 0.4	Valerie Bianchi and Reece Irving
26 August 2021	Draft 0.5	Valerie Bianchi and Reece Irving
31 August 2021	Final 1.0	Valerie Bianchi and Reece Irving
12 November 2021	Final 1.1	Valerie Bianchi and Reece Irving
8 December 2021	Final 1.2	Valerie Bianchi and Reece Irving
15 July 2022	Final 1.3	Valerie Bianchi and Reece Irving
20 July 2022	Final 1.4	Valerie Bianchi and Reece Irving

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1. INTRODUCTION

Waikato Regional Council (WRC) and Bay of Plenty Regional Council (BOPRC) have a history of collaboration and information sharing. Following joint waste stocktakes undertaken in 2007 and 2013[1], the two councils commissioned a new regional waste stocktake in 2021. The objective of this waste stocktake is to provide a comprehensive picture of waste management in the regions, including a snapshot of the current situation, highlight key gaps and opportunities and inform waste prevention work. To achieve this, the report provides:

- key drivers that influence waste and diverted materials
- an overview of territorial authority (TA) Waste Assessments and WMMPs
- an overview of waste and recovery services and facilities in the two regions
- the quantity and composition of waste to landfill and diverted materials
- carbon emissions from Class 1 landfills
- waste projections for the next 10 years
- an evaluation of waste data - including gaps and barriers

In addition to providing an update on waste and recycling generated and disposed of in the regions, WRC has requested further data analysis to support the Waikato Wellbeing project. The Waikato Wellbeing project has a goal of a 50% reduction of waste to landfill by 2030 (from a 2017 baseline). The stocktake assists this project to create an action plan through understanding waste flows and estimated waste projections over the next ten years.

WRC and BOPRC engaged Sunshine Yates Consulting Limited (SYCL) to manage the 2021 waste stocktake. SYCL was supported by Eunomia Research and Consulting and Waste Not Consulting to prepare the document, as these two organisations prepared the previous two regional stocktakes and retain extensive expertise and knowledge around waste in the Waikato and Bay of Plenty regions.

1.1. Overview of Regions

Waikato region occupies a strategic location south of Auckland, meaning that materials (and waste) transiting in and out of Auckland from the south must pass through the region. Key economic activities in the Waikato region include farming (in particular dairy farming), forestry, and tourism. Waikato has a population of approximately 458,202 (Statistics NZ 2018 census). The largest urban centre is Hamilton with a population of approximately 168,600 in the greater urban area. The region is divided into eleven TAs spread across a large geographical area of approximately 25,000 km^2.

Bay of Plenty is one of the country's primary fruit growing regions, and also has important forestry and tourism industries. It is home to the Port of Tauranga, the country's largest and fastest growing container port, which places Bay of Plenty in a strategic position. The region has a population of approximately 308,499 (Statistics NZ 2018 census). The largest urban centre is Tauranga with a

[1] Due to budgetary restrictions in 2017, the 2017 waste stocktake was an update of the 2013 report, rather than a new stocktake. It was recommended that the 2021 stocktake update previous data and provide new data, where appropriate, and a new analysis relevant to the changing waste landscape.

population of approximately 136,713 in the greater urban area. The region is divided into seven TAs spread across approximately 12,200 km² of land and 9,500 km² of coastal marine area.

Figure 1: Territorial Authority Boundaries for Waikato and Bay of Plenty Regions

2. KEY DRIVERS

The waste industry is subject to a number of local and international policy and legislative drivers which aim to minimise the environmental impacts of waste and/or promote waste minimisation.

2.1. Key International Drivers

New Zealand is party to the following key international agreements:

- Montreal Protocol – to protect the ozone layer by phasing out the production of numerous substances;
- Basel Convention – to reduce the movement of hazardous wastes, including plastic wastes, between nations;
- Stockholm Convention – to eliminate or restrict the production and use of persistent organic pollutants;
- Waigani Convention – bans export of hazardous or radioactive waste to Pacific Islands Forum countries;
- The Plastics Pact – to bring together key stakeholders to implement solutions towards a circular economy for plastic.

The Basel Convention in particular has implications for waste management, particularly following the amendments to the Convention in 2019 which were aimed at discouraging the international trade of low-value mixed plastic. From 1 January 2021, most exported mixed plastic requires consent from the receiving country before it leaves New Zealand's shores.

2.2. Key National Drivers

With a change in government in 2017, the last four years have seen a significantly increased focus on waste management from central government and a correspondingly widened work programme. This ranges across policy, legislation, investment, and specific projects such as extended producer responsibility and material bans with the express intent of "accelerating New Zealand's transition towards a circular economy."[2]

2.2.1. Policy

The current New Zealand Waste Strategy (NZWS) was released in October 2010[3]. The Ministry for the Environment (MfE) is revising the New Zealand Waste Strategy and consulted on it in the second half of 2021. The intention is the new strategy will set out the vision, values, and direction for waste

[2] https://environment.govt.nz/what-government-is-doing/areas-of-work/waste/ohanga-amiomio-circular-economy/
[3] https://environment.govt.nz/publications/the-new-zealand-waste-strategy-reducing-harm-improving-efficiency/

management in New Zealand, including investment, planning, and other activity in the sector for the long term.

2.2.2. National Legislation

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

2.2.2.1. The Waste Minimisation Act 2008

The Waste Minimisation Act 2008 (WMA) provides a regulatory framework for waste minimisation. The purpose of the WMA is to encourage waste minimisation to protect the environment from harm and to provide environmental, social, economic and cultural benefits (s 3)[4]. Part 2 of the WMA includes provisions for product stewardship, sets the value of the waste disposal levy, enables product bans and establishes the responsibilities for TAs in relation to waste management and minimisation.

Bans under the WMA include the Waste Minimisation (Microbeads) Regulations 2017[5] and Waste Minimisation (Plastic Shopping Bags) Regulations 2018[6].

In July 2020, the first six 'priority products' were named under the WMA:

- Plastic packaging
- Tyres
- Electrical and electronic products (e-waste)
- Agrichemicals and their containers
- Refrigerants
- Farm plastics

Once a product has been named a 'priority product', an extended producer responsibility approach must be taken and a product stewardship scheme developed. Product stewardship schemes have been developed for tyres, refrigerants, and agrichemicals. Consultation on these schemes took place during 2021. A three-stage approach has also been announced to phase out hard-to-recycle plastic packaging.

Under the WMA the waste disposal levy[7] has been set to progressively increase starting 1 July 2021 (see Table 1). From 1 July 2022, the landfill levy will be extended to Class 2-4 landfills (see Section 4.5.1 for a definition of the different classes of landfill).

[4] https://www.legislation.govt.nz/act/public/2008/0089/latest/DLM999802.html
[5] .https://www.legislation.govt.nz/regulation/public/2017/0291/latest/DLM7490715.html?search=ts_act%40bill%40regulation%40deemedreg_microbeads_resel_25_a&p=1
[6] https://www.legislation.govt.nz/regulation/public/2018/0270/6.0/whole.html
[7] https://www.legislation.govt.nz/regulation/public/2021/0068/latest/LMS474556.html#LMS474591

Table 1: Planned Landfill Levy Rates, per tonne, for Class 1-4 Landfills[8]

Landfill Class	1 July 2021	1 July 2022	1 July 2023	1 July 2024
Class 1	$20	$30	$50	$60
Class 2	-	$20	$20	$30
Class 3	-	-	$10	$10
Class 4	-	-	$10	$10

Alongside the development of a revised NZWS, MfE is also working on a review of the WMA to improve and amend it and consider new provisions. The use of landfill levy funds and the administrative and decision-making processes around its use will also be reviewed and improved.

The NZWS review will also consider whether, and how, the Litter Act (1979) could be adapted to better integrate with and support the WMA.

2.2.2.2. Emissions Trading Scheme (ETS) & Amendments

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, the Act would also require emission units to be surrendered to cover greenhouse gas emissions from the incineration of household wastes.

Some landfill operators have reduced their liabilities under the ETS through use of a unique emissions factor (UEF). There are two types of UEFs:

- Landfill operators can capture and destroy methane generated and therefore reduce their liabilities proportionally by applying for a methane capture and destruction UEF (up to 90% capture and destruction is allowed to be claimed).
- The other method to reduce liabilities is by showing that the landfill accepts less biodegradable waste than is assumed by the default emissions factor (DEF) and applying for a waste composition UEF.

The DEF, i.e. the methane assumed to be generated by each tonne of waste landfilled, is currently 1.19 tonnes of CO_2-e (CO2 equivalent). However, during May 2021 MfE consulted on some possible changes to the ETS including:

- the way waste removed from one facility and disposed of at another is treated – particularly waste removed from a closed landfill (not currently falling under the ETS) and re-disposed of at another landfill (that does fall under the ETS); and
- decreasing the DEF from 1.19 to 0.91 to reflect the most recent composition estimate for waste going to Class 1 landfills.

New Zealand units (NZU) currently change hands for between $30 and $40, with prices for the first half of 2021 hovering at around $36 - $39[9]. Based on an NZU figure of $40 and a DEF of 1.19 the ETS

[8] MfE, April 2021
[9] According to carbon prices on www.carbonforestservices.co.nz

would add $47.60 to the cost of disposing of a tonne of waste. However, the application of a UEF could lower this cost substantially.[10]

Approximately 93% of waste sent to landfill in Waikato and Bay of Plenty regions goes to either Hampton Downs or Tirohia landfills, both located in the Waikato region. These landfills both have high gas capture rates and can avoid 75%-90% of the ETS costs. This means that, in practice, very little is added to the disposal costs at these landfills. This level of additional cost is not expected, on its own, to be sufficient to drive significant diversion from these Class 1 landfills to recovery. On the other hand, for the smaller landfills that do not have gas capture, the additional $40-$50 per tonne could be significant and could see material diverted from these landfills either to recovery, or to one of the large landfills that have lower disposal costs.

Class 2-5 landfills and closed landfills (along with other excluded landfills[11]) are not currently covered by the ETS and therefore do not pay to offset carbon.

2.2.2.3. Local Government Act 2002

Key requirements of the Local Government Act (LGA) relate to the decision-making and consultative processes TAs must follow when a WMMP is reviewed (and some other decisions are made, such as local bylaw regulation).

The LGA Amendment Act (2012), aims to encourage local authorities to place more focus on cost-effective service provision. The Act was amended again 2014 to encourage collaboration and shared services, provide more flexible consultation requirements, and provide for new significance and engagement policies. The 2014 amendments added new requirements for asset management planning and infrastructure strategies, and carrying out regular service delivery reviews, which have been completed by most Waikato and Bay of Plenty TAs.

2.2.2.4. The Resource Management Act 1991

The Resource Management Act 1991 (RMA) has significant implications for waste management and minimisation activity through controls on the environmental effects of activities and facilities through national, regional, and local policy, standards, plans, and consent procedures. Government has considered the recommendations of the Resource Management Review Panel[12] and will, during this current term, repeal the RMA and replace it with three new acts:

- Natural and Built Environments Act
- Strategic Planning Act
- Climate Change Adaptation Act

[10] The ETS is revenue neutral for the Government. NZUs must be purchased from suppliers on the carbon market and the suppliers (e.g. forestry) receive the proceeds from sale of the NZUs.

[11] Essentially small landfills below 1,000 tonnes or on offshore islands. For more details refer to https://www.epa.govt.nz/industry-areas/emissions-trading-scheme/industries-in-the-emissions-trading-scheme/waste/

[12] https://environment.govt.nz/publications/new-directions-for-resource-management-in-new-zealand-report-of-the-resource-management-review-panel-summary-and-key-recommendations/

It is not yet clear what the ramifications will be for waste management and minimisation, although one likely outcome is that various regional rules will be aligned and consolidated in a shorter list of national environmental standards.

2.2.2.5. Hazardous Substances and New Organism Act 1996 (HSNO)

This Act, along with the 2015 Amendment Act, addresses the management (including disposal) of substances 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 need to be addressed within operational and health and safety plans for waste facilities. Hazardous substances commonly managed 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.[13]

2.2.3. Investment

2.2.3.1. Waste Minimisation Fund

The Waste Minimisation Fund (WMF) continues to be a key source of funding for waste minimisation projects. The purpose and operation of the WMF is described on MfE's website[14].

Many projects across the Waikato and Bay of Plenty regions have benefited from funding through the WMF. Many projects across the Waikato and Bay of Plenty regions have benefited from funding through the WMF. Previous projects funded through the WMF include:

- Reuse Centre Establishment Guide and CReW Reuse Centre Establishment (Energy Options Ltd, Whakatane District Council, Te Runanga o Ngati Awa - 2010)
- Trial of Vermicomposting for Mixed Municipal, Commercial and Industrial Organic Wastes (Bay of Plenty Regional Council - 2010)
- Wood Grinder (Goodwood Ltd - 2016, Bay of Plenty)
- Resource Recovery Centre Development and Improvement (Seagull Centre Trust - 2015, 2018)
- Para Kore implementation (Para Kore Marae Incorporated, multiple years, multiple areas)
- Electronic and Whiteware Recycling Programme Expansion (South Waikato Achievement Trust, 2015)
- Whaingaroa Organic Waste Diversion to Compost (Xtreme Waste Incorporated Society - 2010, 2011, Waikato Distict Council - 2015)

[13] From: MfE 2009: Waste Management and Minimisation Planning, Guidance for Territorial Authorities.
[14] https://environment.govt.nz/what-you-can-do/funding/waste-minimisation-fund/

The most recent 2021 funding round had a focus on organic waste, and construction and demolition waste.

2.2.3.2. Levy funding to TAs

Under the Waste Minimisation Act, 50% of revenue from the waste levy must be distributed to TAs. These funds are provided to TAs pro rata, based on their population, and must be spent on waste minimisation and in accordance with their WMMP.

Five TAs across the Waikato and Bay of Plenty regions provide contestable funds, using some of their allocation of waste levy funds. TAs with contestable funds include Hamilton City Council, Matamata-Piako District Council, Taupō District Council, Tauranga City Council and Waipa District Council.

These funds are generally available to community groups, businesses, Iwi/Maori organisations, educational institutions, and other community-based organisations to undertake waste minimisation activities and initiatives within that TA's district or city.

TA's without contestable funds may provide funding from their waste levy funds o n a case by case basis.

2.2.3.3. InfraCom

The Infrastructure Commission (InfraCom) was established in 2019 with the goal of making infrastructure investment in New Zealand more purposeful and strategic, including investment in waste infrastructure. InfraCom are consulting on their initial findings 'Infrastructure for a Better Future'[15] until 2 July 2021.

2.2.3.4. COVID-19 Response and Recovery Fund

A proportion of this fund was invested in waste management and minimisation infrastructure. Investment specifically for the Waikato and Bay of Plenty regions included:

- $20.5M to Tauranga City Council to upgrade infrastructure and support the introduction of new kerbside services;
- investment in the Green Gorilla sorting facility in Auckland, which processes a small quantity of waste from the Waikato region;
- improved sorting equipment at EnviroNZ Ltd's material recovery facility (MRF) in Hamilton ;
- improved sorting equipment at Smart Environmental Ltd's MRF in Kopu, Thames ; and
- Plasback collection services in the Bay of Plenty region.

2.2.3.5. Plastics Innovation Fund

As of 1 November 2021, any legal entity can submit an expression of interest for funding from the $50 million fund that supports the reimagination of how plastics are made, used and disposed of[16]. Funding is available for, amongst others, designing out waste, new products, improved recycling and new technologies.

[15] https://infracom.govt.nz/assets/Uploads/Infrastructure-Strategy-Consultation-Document-May-2021.pdf
[16] https://environment.govt.nz/what-you-can-do/funding/plastics-innovation-fund/

2.2.4. Other Initiatives

2.2.4.1. Climate Change Commission

The Climate Change Commission 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. The Commission reviewed the waste sector as part of their work during 2020 and 2021 and has provided their final advice to government. The recommendations for the waste sector included an increase in waste minimisation infrastructure investments to decrease methane emissions from waste by at least 40% by 2035 from 2017 levels[17].

2.2.4.2. Container Return Scheme

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. This project was concluded in 2020, and the outputs from this project are under ministerial review.

2.2.4.3. 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 initiatives to address significant gaps.

2.2.4.4. Kerbside Standardisation

The Waste Management Institute of New Zealand (WasteMINZ) was commissioned by MfE to complete a review of kerbside collections and make recommendations as to how better consistency could be achieved across the country. The report was completed in 2020[18], and MfE is currently considering how best to implement the recommendations.

2.2.4.5. Waste Data and Monitoring

Alongside the increase and expansion of the waste levy, MfE is developing protocols to collect data from the facilities that will have to start paying the landfill levy (Class 2-4 landfills). MfE has also adopted regulations that prescribes the collection of data from Class 5 landfills and transfer stations[19], and is currently developing an approach for performance reporting by TAs.

[17] https://www.climatecommission.govt.nz/our-work/advice-to-government-topic/inaia-tonu-nei-a-low-emissions-future-for-aotearoa/chapter-summaries/
[18] https://www.wasteminz.org.nz/wp-content/uploads/2020/08/Final-1.0-Standardising-Kerbside-Collections-in-Aotearoa.pdf
[19] https://www.legislation.govt.nz/regulation/public/2021/0069/latest/whole.html

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2.3. Key Regional Drivers

2.3.1. Commercial drivers

A range of commercial drivers impact waste management in the two regions.

The regions have access to two large privately-operated landfills – EnviroNZ's North Waikato Landfill at Hampton Downs, and Waste Management NZ Ltd's Tirohia landfill near Paeroa. The costs to dispose of waste at these landfills are affected by the Emissions Trading Scheme (ETS) and the landfill levy, which increase costs, and by the scale of these relatively large landfills. All things considered, the regions have access to some of the lowest Class 1 landfill disposal costs in New Zealand.

There are also smaller TA-controlled Class 1 landfills that are used by some TAs, particularly in southern Waikato, that do not have the benefit of economies of scale. However, these facilities do return revenue to their owner councils.

The implementation of the National Policy Statement for Freshwater Management[20] 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 quantities of 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 products.

With relatively high Class 1 landfill disposal costs the incentive to dispose of materials to Class 2 – 4 landfills is high. This will increase with the levy changes as the increase in the levy on Class 1 sites exceeds the levy imposed on Class 2 – 4 sites.

2.3.2. Waikato Region

2.3.2.1. Waikato Regional Policy Statement

The 2016 *Waikato Regional Policy Statement* mentions solid waste management in several contexts, including the following:

- The objective for sustainable and efficient use of resources (requires that the generation of waste is minimised);
- Policies around energy demand management (developments should minimise waste production, encourage the beneficial re-use of waste materials);
- Reporting (five-yearly effectiveness reporting will include waste generation);
- General development principles (should encourage waste minimisation and efficient use of resources - such as resource-efficient design and construction methods); and
- Environmental results anticipated (solid waste entering a landfill is reduced).

The policy statement also includes two specific implementation methods for energy demand management relating specifically to solid waste, the WRC will*:*

[20] https://environment.govt.nz/publications/national-policy-statement-for-freshwater-management-2020/

a) *Work with territorial authorities, industry and community groups to facilitate and encourage initiatives for the minimisation and reuse of waste; and*
b) *Facilitate the collation and dissemination of regional waste data to support the identification of waste management priorities and trends.*

2.3.2.2. Waikato Regional Council 10-year Strategy

In 2020 the WRC's latest 10-year strategy was released. The six listed strategic priorities areas are:

- Water
- Biodiversity and biosecurity
- Sustainable infrastructure
- Climate
- Coastal and marine
- Transport connections

These strategic priorities are linked to the appropriate United Nations Sustainable Development Goals (SDGs), which are also referenced in the Waikato Wellbeing project discussed below.

Waste management is specifically linked to the Climate priority and is also relevant to the Sustainable Infrastructure and Water priorities.

2.3.2.3. Waste Prevention Action Plan 2020-2025

The WRC's Waste and Resource Efficiency Strategy expired in 2018. The Strategy is due to be replaced by the Waste Prevention Action Plan 2020-2025. This plan intends to accelerate the transition to a circular economy in the Waikato region, through actions and investments in partnerships with central government, local authorities, iwi and hapu, businesses, and community organisations.

2.3.2.4. Waikato Wellbeing

The Waikato Wellbeing Project is a regional initiative, launched in 2020, to achieve a more environmentally sustainable, prosperous, and inclusive Waikato region by 2030.

The Waikato Wellbeing Project has adopted ten wellbeing targets, based on the SDGs. These wellbeing targets have been adapted to meet the unique challenges facing the Waikato region, and aim to end poverty, fight inequality and act on climate change.

One of the ten wellbeing targets is based on the 12th SDG, 'Ensure responsible consumption and production patterns', and has been defined by the Waikato Wellbeing Project as "Increase the number of households, schools, businesses, and farms who reduce their waste leading to a 50% reduction of waste to landfill by 2030".

The other nine targets, some of which incorporate multiple SDGs, are:

1. No poverty, Zero hunger
2. Good health and wellbeing
3. Quality education, Decent work and economic growth, Reduced inequality
4. Clean water and sanitation

5. Affordable and clean energy
6. Sustainable cities and communities
7. Climate action
8. Life below water
9. Life on land

WRC is a key partner in this project, and will be driving the development of:

- leadership and expertise to support system mapping and development;
- research to understand the systemic issues, key questions and challenges;
- advocacy through the Waikato Plan and Strategic Partners Forum; and
- data collection and measurement of what matters, as well as support making sense of the data.

Mātauranga and Te Ao Māori (Māori world view) principles are embedded in the Waikato Wellbeing Project. Oversight for the project is being provided by the Waikato Plan Leadership Committee and the project is being supported by Waikato-Tainui, Trust Waikato, Hamilton City Council, D.V. Bryant Trust, the University of Waikato NAR Foundation and Momentum Waikato.

2.3.3. Bay of Plenty Region

2.3.3.1. Regional Waste Strategy

The BOPRC adopted the *Bay of Plenty Waste and Resource Efficiency Strategy* (BoP WRES) in 2013. The BoP WRES sets out the key waste issues and priorities for the region and outlines a programme of action through to 2023. The focus areas for the actions are:

- Foster collaboration, partnerships and promote forward planning
- Improve data and information management
- Review regulatory environment governing waste
- Increase product stewardship, resource efficiency and beneficial reuse
- Reduce the harmful impacts of waste
- Stimulate research and innovation to develop new solutions

In addition, the BoP WRES identifies a range of issues/opportunities for developing initiatives. These are:

- Accessing consistent reliable data
- Cleanfills and managed fills
- Construction and demolition wastes
- Contaminated soil and special wastes
- Dry recyclables and commodities
- Farm dumps
- Liquid wastes
- Organic wastes
- Product stewardship
- Recycling and waste diversion services and facilities

- Regional facilities
- Relationships and responsibilities between private, public and community sector.

Regional Council funding for implementing the BoP WRES was put on hold in 2020 as the council redirected funds towards core council business. Due to a lack of legislative requirements for regional councils to directly invest in waste minimisation, projects identified by the WRES are currently on hold.

3. WASTE ASSESSMENTS AND WMMPS

3.1. Introduction

Every TA is required by the WMA to carry out a formal review of its existing waste management and minimisation plan (WMMP) no less than six years following the adoption of the WMMP. As a preliminary step to the review and (if necessary) preparation of a new WMMP, TAs are also required to carry out a Waste Assessment. The Waste Assessment is intended to provide the information necessary to identify the key issues and priority actions that will be included in a next WMMP.

Waste Assessments need to consider waste and recovered material streams (including services applying to those waste streams) beyond those in the immediate control of the TA. It should include:

- All current commercial and industrial waste and recovered material streams;
- All relevant services provided by the private sector;
- A forecast of future demand across all waste and recovered material streams;
- Consideration of options to meet forecast demand;
- The TA's intended role in meeting that demand.

WMMPs should summarise the current situation, set out the key waste management and minimisation issues that have been identified, and outline the proposed approach to addressing these issues strategically and within an action plan, including funding arrangements.

Since the last Waikato and Bay of Plenty regional stocktake in 2017, five TAs have either adopted a new WMMP or are in the process of doing so. Table 2 below summarises the current waste assessments and WMMPs of the Waikato and Bay of Plenty TAs as of 31 May 2021.

Table 2: TA Waste Assessments and WMMPs 2021

TA	Waste Assessment	WMMP
	Waikato Region	
Hamilton City Council	2017	2018 - 2024
Hauraki District Council	Joint East Waikato, 2017	Joint East Waikato, 2017
Matamata-Piako District Council (in development)	2021	Completed consultation on 2021 draft
Ōtorohanga District Council	2018	2018 - 2024
South Waikato District Council (new)	2018	2018 - 2024
Taupō District Council (new)	2017	2018
Thames-Coromandel District Council	Joint East Waikato, 2017	Joint East Waikato, 2017
Waikato District Council (new)	2018	2018 - 2024
Waipa District Council	2017	2017 - 2023

TA	Waste Assessment	WMMP
Waitomo District Council	2017	2018
Bay of Plenty Region		
Kawerau District Council	2012 (overdue for review)	2012 (overdue for review)
Ōpōtiki District Council	2017	2018
Rotorua District Council	2015 (renewal due in 2021)	2016
Tauranga City Council	Joint Tauranga and Western Bay, 2016	2016 - 2022
Western BOP District Council	Joint Tauranga and Western Bay, 2016	2017
Whakatāne District Council (in development)	2021	Completed consultation on 2021 draft

The more recent WMMPs have been structured using the templates developed through the Waikato and Bay of Plenty Waste Liaison Group (see section 3.4.1) in 2016, resulting in a more consistent layout and presentation of content.

Common themes in the WMMP key issues section (based on current or consultation draft WMMPs) include:

- Recycling - improving services, capture and addressing contamination issues;
- Data - accessing more quality data relating to waste streams outside TA control;
- Facilities/infrastructure - lack of adequate infrastructure for specific waste streams, or geographical gaps in infrastructure;
- Construction and demolition waste management;
- Organic waste management;
- Illegal dumping and litter management;
- Other waste streams such as e-waste and rural waste;
- Advocacy for national instruments such as mandatory product stewardship; and
- Opportunities for collaboration between TAs and with the private and community sectors.

3.2. Review of Waste Assessments

A review of current Waste Assessments shows relatively consistent report structures, and presentation and analysis of data across the two regions.

The quality and quantity of information relating to waste and diverted material streams varies between TAs, and this is discussed further in Section 7.2.

There was a lack of data on the quantities and types of waste and diverted materials that are not directly managed by TAs. This would be resolved by a cross-regional waste operator licensing and data collection system.

3.3. Review of WMMPs

3.3.1. Vision, Goals, and Objectives

WMMPs set out the TAs vision for waste management and minimisation, with associated goals and objectives. These are summarized in Appendix A.1.0.

Compared to WMMPs in place in 2017, current WMMPs establish more specific strategic directions, with clear links between key issues and action plans.

3.3.2. Waste Minimisation Targets

Most TAs in both regions have set specific waste minimisation targets in their WMMPs, as shown in Table 3. Kawerau, Ōtorohanga, and Ōpōtiki District Councils have not set specific targets, with Ōtorohanga and Ōpōtiki noting that available data was too unreliable to establish any useful targets.

Table 3: Summary of Waste Minimisation Targets in WRC and BOPRC WMMPs (May 2021)

TA	Kerbside Recycling	Kerbside Waste	Diverted Material	Landfill (kg per capita)	Other
Waikato Region					
Hamilton City Council	50% increase*	25% decrease*	10% increase*	10% decrease*	50% decrease in event waste* 10% decrease in litter; and 15% decrease in dumping compared to 2017
Hauraki District Council		5% decrease from 78 to 74kg by 2022		13% decrease from 363 to 316kg by 2022	Based on NWDF indicators
Matamata-Piako District Council		1% decrease from previous year		30% decrease of organic waste to landfill by 2025	
Ōtorohanga District Council					Unavailable and unreliable data, and uncontrollability of waste management renders council unable to provide targets

TA	Kerbside Recycling	Kerbside Waste	Diverted Material	Landfill (kg per capita)	Other
South Waikato District Council			Amount increases every year	Amount decreases every year	Additional target: support waste education in 50% of schools Finalize and implement decision on disposal site by 2020
Taupō District Council			Increase diversion rate from 46% to 51% by 2028		Includes review of previous target (3% decrease of waste to landfill based on 2010) which was not achieved as total increased with 13%
Thames-Coromandel District Council		5% decrease from 131 to 124kg by 2022		13% decrease from 688 to 599kg by 2022	Based on NWDF indicators
Waikato District Council		5% decrease*	20% increase*	10% decrease*	
Waipa District Council	Increase by 10% compared to 2017		Increase of 25% of recyclables collected at transfer stations compared to 2017 by 2023	Decrease from 500kg to 450kg by 2023	
Waitomo District Council		1% decrease per year (as of 2016) of: recyclables proportion in kerbside waste, and organics proportion in kerbside waste			

TA	Kerbside Recycling	Kerbside Waste	Diverted Material	Landfill (kg per capita)	Other
Bay of Plenty Region					
Kawerau District Council					None specified, WMMP overdue for renewal
Ōpōtiki District Council					Includes review of previous targets: 10% increase of recyclables (achieved, was 16%) and a 10% decrease of waste to landfill (not achieved, was 3%) No current targets provided due to “not a great deal of certainty about the data”
Rotorua District Council		30% decrease by 2022**	50% increase by 2022 from current levels**		
Tauranga City Council			Increase from 292kg (2015) to 526kg per capita by 2022		
Western Bay of Plenty District Council			Increase from 292 kg (2015) to 525kg per capita by 2022		
Whakatāne District Council				Stay below 70% of national average waste to Class 1 landfill	
*Notes: * No baseline provided* *** Incomplete baseline provided*					

There is a moderate level of consistency in the type and number of targets set. Some TAs that have set targets have not provided a complete baseline including date and quantity. Several TAs have reflected upon the current lack of data and high level of change in the waste sector and noted that this makes it difficult for a TA to predict what is going to change with waste streams in their area during the term of their WMMPs.

3.3.3. Action Plans

All WMMPs reviewed contained an action plan. The number of actions listed varied from 15 to 35 measures and were often grouped with headings such as "infrastructure", "collections" and "waste minimisation". However, similar measures were found listed under different groupings per TA, making a combined grouped overview difficult. There were five general action items mentioned in nearly every WMMP and they included:

- Actions around awareness, communications, and education of waste minimisation topics;
- Various forms of collaboration including those with the waste liaison group, Para Kore, industry, community groups;
- Further optimisation and/or review of kerbside services;
- Advocating for (mandatory) product stewardship schemes; and
- The intent to monitor and report on data.

A summary of the actions identified by all the TAs as listed in their WMMPs is shown in Appendix A.2.0. There is a wide variation in the exact type of actions put forward in WMMPs, and so these have been categorised to assist with presentation of the information. Where possible, any waste streams or target markets specified in the WMMP action plan have been shown.

There is a significant level of commonality in action plans between the TAs, suggesting opportunities for collaboration and joint work.

3.3.4. Current TA Kerbside Services

Table 4 provides an overview of services and facilities available across the Waikato and Bay of Plenty regions. For a full list of facilities available within the districts see Appendix A.3.0. Waste contracts are discussed in the next section (3.3.5).

Table 4: TA Rubbish and Diverted Material Services

TA	Household Kerbside Rubbish	Household Kerbside Recycling	Household Food/ Greenwaste	Drop-off Facilities (1)	Refuse Transfer Station	Landfill
Waikato Region						
Hamilton City Council	Fortnightly	Fortnightly	Weekly		Two	
Hauraki District Council	Weekly	Fortnightly			Two	
Matamata-Piako District Council	Weekly	Fortnightly			Three	
Ōtorohanga District Council	Weekly	Weekly		Four	Two	
South Waikato District Council	Weekly	Fortnightly		Two	Two	One - Tokoroa
Taupō District Council	Weekly	Weekly			Four	One - Broadlands
Thames-Coromandel District Council	Weekly	Fortnightly		Three	Seven	
Waikato District Council	Weekly	Weekly	Weekly in Raglan		Three	
Waipa District Council	No council service	Fortnightly comingled, monthly glass			One	
Waitomo District Council	Weekly	Weekly		One	Six	One – Waitomo
Bay of Plenty Region						
Kawerau District Council	Weekly	Weekly	Fortnightly greenwaste		One	
Ōpōtiki District Council	Weekly	Weekly (urban)			Three	
Rotorua District Council	Weekly	Fortnightly		One	Six	One - Atiamuri
Tauranga City Council (starting July 2021)	Fortnightly	Fortnightly	Weekly food Greenwaste optional	One	Two	

TA	Household Kerbside Rubbish	Household Kerbside Recycling	Household Food/ Greenwaste	Drop-off Facilities (1)	Refuse Transfer Station	Landfill
Western BOP District Council (starting July 2021)	Weekly	Fortnightly	Urban - Weekly food	Four		
Whakatāne District Council	Weekly	Fortnightly	Urban - fortnightly greenwaste	One	Three	
Note: (1) Only includes drop-off facilities that are not associated with a RTS						

As of July 2021, fifteen of the sixteen TAs in the Waikato and Bay of Plenty regions will provide a kerbside rubbish service to a proportion of residential properties, and all sixteen of the TAs will provide a kerbside recycling collection. Appendix A.4.0 shows the types of collections and recyclable materials collected.

Three TAs provide a greenwaste collection and three have implemented food waste collections.

Kerbside collections of rubbish and recycling are available to households in all districts, mostly through services provided by the TAs, with Tauranga and Western Bay in the process of introducing TA-contracted services.

Kerbside rubbish collection contractors and collection costs in each district and city are listed in Appendix A.5.0.

Drop-off facilities (including at Refuse Transfer Stations (RTS) for rubbish and recycling are also available in all districts, with recycling drop-offs often provided for those residents who may not be served by kerbside recycling collections (i.e. rural residents).

In many instances, private waste collectors compete with TA services by offering rubbish collections in a 240L wheelie bin (while TA collections are generally in smaller wheelie bins or bags). Residential users of these private services have repeatedly been found, through audits of kerbside rubbish, to dispose of larger quantities of recyclable materials and, in particular, greenwaste than users of rubbish bags or smaller wheelie bins.

In areas where private collectors compete directly with TA services, this also has the effect of raising the unit cost of TA services, as it is more expensive on a per household basis to collect kerbside rubbish that is more widely dispersed.

Waste composition data routinely shows that food waste comprises 40%-50% of kerbside rubbish. This is one of the most significant waste minimisation opportunities in the country. Since the last stocktake, three TAs in Waikato and Bay of Plenty regions have introduced or committed to kerbside food waste collections.

3.3.5. Current TA Kerbside Contracts

A list of TA contractors for major waste services is provided in Appendix A.6.0. Timelines for the expiry of kerbside collection contracts are shown below in Figure 1.

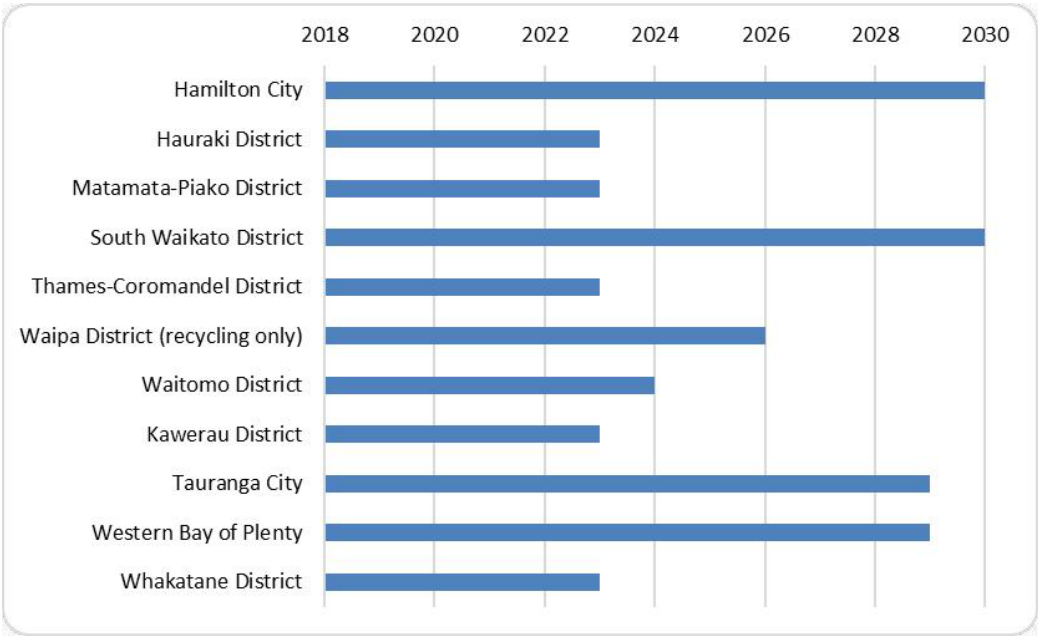

Figure 1: Expiry of Kerbside Waste Collection Contracts

Contract expiry dates are currently unclear for Ōtorohanga, Rotorua and Waikato District Councils.

Five contracts expire in 2023, as a result of two groups of TAs undertaking parallel procurement processes for their current contracts:

- The East Waikato group with Matamata-Piako, Hauraki, and Thames-Coromandel District Councils (who currently hold a joint services contract);
- A grouping of Whakatāne and Kawerau District Councils (these TAs hold individual contracts).

East Waikato TAs have indicated that they may pursue a joint procurement process for their new services contracts, but decisions have not been made as to whether the TAs would pursue a joint contract or separate contracts.

3.4. Collaborative Initiatives

There are several collaborative initiatives in the Waikato and Bay of Plenty regions that bring TAs together to work on waste and resource diversion issues. Some of these initiatives are described in the following sections.

3.4.1. Waikato and Bay of Plenty Waste Liaison Group

This group has been in existence since 2002 and brings together waste management staff from TAs in the Waikato and Bay of Plenty regions, as well as New Plymouth, Taranaki, Ruapehu and Gisborne district councils. The Waste Liaison Group provides a platform to share information and experience on waste issues and identify potential initiatives and collaborative opportunities.

Previous collaborative projects include:

- Waste Stocktake for Waikato and Bay of Plenty Regions 2013 and 2017 (the previous versions of this report)
- Resource Recovery Network Scoping Study for Waikato and Bay of Plenty 2014 (Eunomia)
- Rural Waste Surveys Data Analysis Waikato and Bay of Plenty 2014 (GHD Ltd)
- Templates for Waste Assessments, WMMPs, and solid waste bylaws
- Development of a cross-regional waste operator licensing and data collection systems
- Joint submissions to waste related consultations from Central Government.

Several work areas have previously been identified as having potential for further collaborative work, including[21]:

- Waste education
- Putrescible (wet organics) waste management
- Reuse/resource recovery centres
- Recycling collections (since made largely redundant by the kerbside standardisation project)
- Landfill - capacity, regional approach
- Events waste minimisation
- Facilities, processing for recyclables (since made largely redundant by national work programmes)
- Rural (farm) wastes management and diversion
- Biosolids
- Procurement
- E-waste
- C&D - prevention, collection and processing
- Greenwaste management
- Rural waste management generally
- Tyres

3.4.1.1. Regional Waste and Contaminated Land Forum

The key objectives of the Regional Waste and Contaminated Land forum are:

- liaison, communication and exchange of technical and policy information relating to waste minimisation and contaminated sites issues between regional council officers
- prepare recommendations to the regional councils' Chief Executives, via the Resource Managers' Group, that reflect the collective agreement of regional council technical officers on significant waste management and contaminated sites issues
- provide more uniformity between regional councils and unitary authorities in their approach to waste and contaminated sites

[21] Eunomia (2015) Review of Waikato Regional Council and Bay of Plenty Regional Council Joint Projects and Collaboration Opportunities Report for Bay of Plenty and Waikato Regional Councils (Contract No. CMS2015/2016-1071)

- facilitate co-ordination with other agencies.

3.4.1.2. Waikato and Bay of Plenty Local Authority Shared Services

The Waikato and Bay of Plenty Local Authority Shared Services (LASS[22]) are council-controlled organisations (CCOs) owned by the region's TAs. The objective of these CCO's is to provide the TAs in their region with a vehicle to develop shared services that demonstrate a benefit to taxpayers.

3.4.1.3. Other collaborations

Other TA collaborations in the Waikato and Bay of Plenty regions include:

Tauranga City Council and Western Bay of Plenty District Councils: These TAs have been collaborating on waste management issues for many years. They currently have a joint waste assessment, but separate WMMPs; and have just collaborated on a joint procurement process for new council-contracted waste services.

East Waikato Councils (Thames-Coromandel, Matamata-Piako, Hauraki District Councils): These three TAs currently have a joint Waste Assessment, WMMP, and shared waste services contract. However, Matamata-Piako have already developed their own 2021 Waste Assessment and have consulted on their draft WMMP.

Waikato Regional, Waikato District, Waipa District, and Hamilton City Council: These four TAs meet twice a year to work on joint projects and identify possible future issues that could be addressed through collaboration.

[22] https://www.waikatolass.co.nz/; https://www.boplass.govt.nz/

4. WASTE MANAGEMENT IN WAIKATO AND BAY OF PLENTY REGIONS

The prevention, diversion, management and disposal of waste in Waikato and Bay of Plenty regions involves local authorities (regional councils, city and district councils), the private sector, and the community sector. While organisations in each of these categories undertake discrete activities, there is also collaboration on specific issues and in some cases in providing services.

4.1. Role of Territorial Authorities

The TAs' actions in the waste sector are driven by the need to fulfil their statutory obligations in respect of waste, and the need to meet the expectations of their communities which relate to service levels and cost. The TAs also issue land use consents under the RMA for waste transfer, processing, and disposal facilities.

Although WMMPs are required to consider the waste hierarchy; in practice, TAs do not generally have the relevant regulatory powers, legislative mandate, nor resources to achieve policy or infrastructural outcomes at the top of the waste hierarchy.

There is varying control of strategic waste infrastructure assets between TAs and the private sector. A recent national trend has seen increased reliance on the private sector for landfills and large-scale reprocessing. TAs tend to control the majority of transfer stations, resource recovery centres, and drop-off facilities; and household kerbside services. With only a few exceptions, operation of these services and facilities are contracted out to external organisations - usually the private sector.

Except where TAs have historical assets, TAs' role in infrastructure, particularly in developing new infrastructure, is limited, and has been diminishing. TAs may own infrastructure (or enter into some form of partnership arrangement) related to delivery of TA services, such as a MRF or a composting facility, but the assets are likely to be limited to these roles; and many smaller TAs do not have the scale, capital, or capacity to develop infrastructure on their own.

4.2. Role of Regional Councils

WRC and BOPRC set policy on a wide range of environmental issues through their regional policy statements. The regional councils also monitor and enforce resource consent conditions that apply to gases, odours and contaminants to stormwater (and leachate) at waste facilities.

WRC and BOPRC also play a role in facilitating cooperation between waste officers from the 16 TAs in the region.

4.3. Community Sector Involvement

Community sector involvement tends to be unevenly spread across the regions, with pockets of activity that have grown out of local initiatives - generally in smaller communities. Initiatives that aim to directly minimise waste include Xtreme Zero Waste in Raglan, Seagull Centre in Thames, The

Goldmine in Coromandel township, the South Waikato Achievement Trust and CReW in Whakatāne. In addition to these, there are local education-focussed centres such as Kaivolution (GoEco) in Hamilton, Envirohub Bay of Plenty, Good Neighbour in Tauranga, Whāingaroa Environment Centre, and more far-reaching community-based education programmes such as Paper for Trees, Para Kore, and Enviroschools.

The community sector plays a vital role in waste management and minimisation in some communities. Generally, community initiatives grow out of the vision, energy and goodwill of a few individuals which then gains a wider following, achieving what they set out to do in terms of disseminating awareness and education. Many of these initiatives rely on volunteer hours and/or outside funding to operate which can be constraining.

There is a role for regional councils to facilitate and foster greater community activity in this area with a focus on community economic development opportunities within the regions.

4.4. Role of the Private Sector

The private sector plays an important role in the waste industry in the Waikato and Bay of Plenty regions, as owners and operators of infrastructure, including landfills and MRFs. The private sector also provides private waste and recycling collection services to businesses across the two regions, and provides contracted services to most TAs to collect domestic kerbside rubbish and recycling. The private sector also operates most of TA-owned waste infrastructure, such as transfer stations.

The waste management industry across the two regions is currently dominated by two private sector companies - Waste Management NZ Ltd (WMNZL) and EnviroWaste Services Ltd (ESL), with Smart Environmental Ltd also playing a significant role in east Waikato.

4.5. Waste and Recovery Services and Facilities

New Zealand waste markets have historically shown strong TA involvement in infrastructure ownership, often with council-owned transfer stations and landfills serving geographically distinct waste catchments[23]. However, the waste disposal market in Waikato and Bay of Plenty regions has moved away from this model, with privately-owned, regional Class 1 landfills now dominating the disposal market.

Ownership of infrastructure (transfer stations, materials recovery facilities, cleanfills, and landfills) varies across the regions, as does the number and types of waste management facilities.

Since the previous stocktake in 2017, South Waikato District Council has closed its Tokoroa Landfill and Rotorua Lakes Council has closed its Atiamuri facility. As of 2021, only Waitomo District and Taupō District contain council-owned Class 1 landfills. However, most TAs own all of the transfer stations in their district and make use of one of the two large privately-owned Class 1 landfills in the Waikato region (Tirohia and Hampton Downs). Ownership of transfer stations still most commonly stands with TAs, but the number of privately-owned transfer stations is increasing. Since the 2017 stocktake, new

[23] A waste catchment is a geographical area within which all of the waste that is generated is also disposed of, and within which little or no waste from outside the area is disposed of.

privately-owned transfer stations have opened in Hamilton, Rotorua, and Tokoroa. Recycling and reprocessing facilities are generally privately-owned.

The following sections provide a broad overview of waste and recovery services and facilities in Waikato and Bay of Plenty regions. Facilities have been generally categorised with reference to the waste hierarchy (as defined by the WMA).

There are many more small private operators, in both the waste and resource recovery industries, which have not been considered for this inventory.

4.5.1. Classes of Facilities for the Disposal of Waste to Land

The WasteMINZ "Technical Guidelines for Disposal to Land" [24] sets out standards for disposal of waste to land, and classifies landfills into five categories, as outlined in Table 5.

Table 5: Classes of landfills

Classes of landfills	Description of materials accepted
Class 1 - Municipal Landfill	Accepts municipal solid waste. A Class 1 landfill generally also accepts C&D waste, some industrial wastes and contaminated soils. The equivalent of a "disposal facility" as defined in the WMA.
Class 2 - Construction and demolition / Industrial Landfill	Accepts non-organic wastes including construction and demolition wastes, inert industrial wastes, managed fill material, and clean fill material.
Class 3 - Managed Fill	A Class 3 landfill accepts materials comprising predominantly clean fill materials, but also includes other inert materials and soils with chemical contaminants.
Class 4 - Controlled Fill	A Class 4 landfill accepts predominantly controlled fill and cleanfill materials but may also include soils with chemical contaminants;
Class 5 - Cleanfill	A cleanfill is a landfill that accepts only clean excavated natural materials.

4.5.2. Class 1 Landfills

Table 6 provides details on the four Class 1 landfills. There are currently four Class 1 landfills in Waikato region and none in the Bay of Plenty. Two of the four Class 1 landfills in Waikato region are small council-owned facilities and two are large privately owned facilities. The table lists the sources of waste, where these are known.

[24] Technical Guidelines for the Disposal to Land. WasteMINZ, April 2016

Table 6: Class 1 Landfills

Name of facility	Owners and location (District)	Description and consent	Waste sources from the regions
Tirohia Landfill	Waste Management NZ Ltd, Hauraki District	Non-hazardous residential, commercial and industrial solid waste, including special wastes. Consented to 2035. Resource consent applications for expansion have been lodged. Has a landfill methane capture and destruction system.	Opotiki, Whakatāne, Kawerau, Matamata-Piako, Hauraki, Thames-Coromandel, Rotorua Lakes Small quantities of waste from Tauranga and WBOP Waste from Gisborne District (out of regions).
Broadlands Road Landfill, Taupō	Taupō District Council, Taupō District	No gas capture system in place. Consented to 2027.	Primarily waste from Taupō District Council
North Waikato Regional Landfill (Hampton Downs)	EnviroWaste Services Ltd, Waikato District	Non-hazardous residential, commercial and industrial solid waste, including special wastes. Sludge with less than 20% solid by weight are prohibited. Consented to 2030. Capacity to at least 2045. Has a landfill methane capture and destruction system in place,	Waikato, Hamilton, Waipa, Tauranga, Western BoP, South Waikato
Waitomo District Landfill	Waitomo District Council, Waitomo District	Consented capacity of 232,000 tonnes. As of 2017, capacity remained until 2023.	Waitomo, Ōtorohanga, South Waikato

Figure 2 shows the locations of the four Class 1 landfills in the regions and the major waste flows into each. It is understood there are some regular, commercial waste flows that are not shown on the map, such as from Tauranga City to Tirohia landfill, but these are considered to be minor and specific information is lacking.

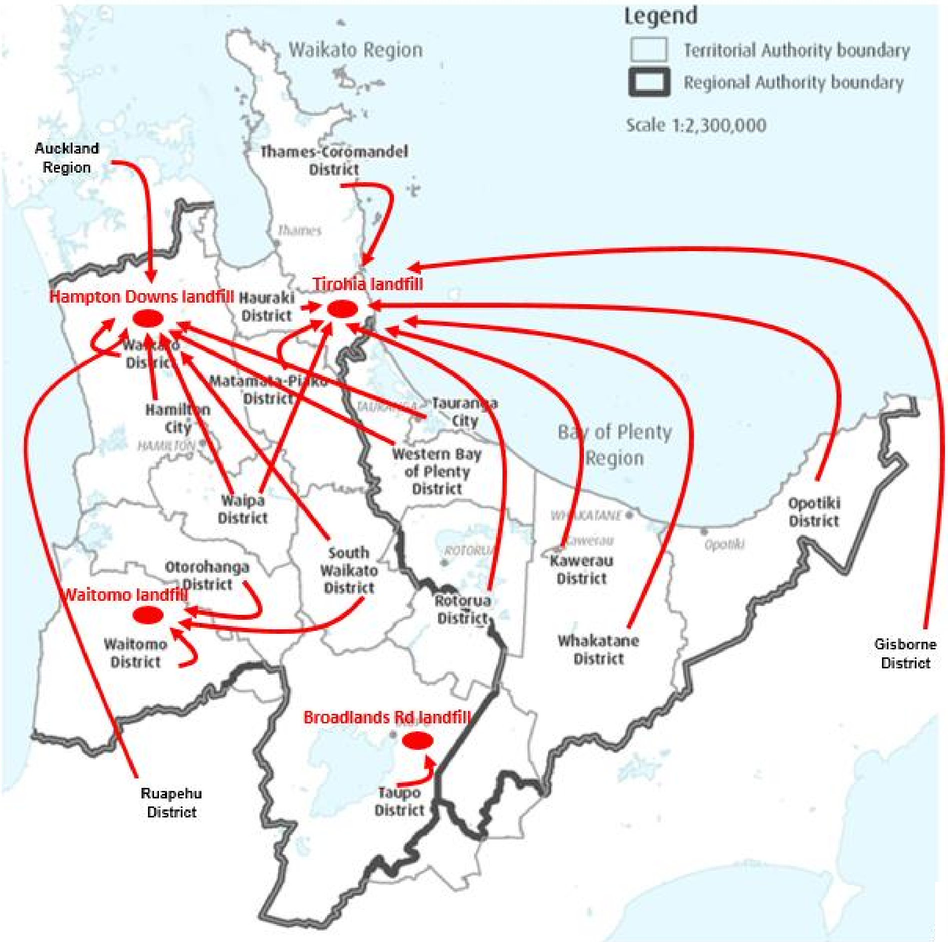

Figure 2: Landfill Locations and Waste Flows

In addition to the regional facilities in Table 6, there are several disposal facilities situated outside of the Waikato region that do not currently receive waste from the region but are within a reasonable distance. These could be viewed as strategic assets in the (unlikely) event of temporary or permanent premature closure of one or more of the key regional disposal facilities. These out-of-region facilities include:

- Redvale Landfill, north of Auckland, scheduled to close in the next decade
- Whitford Landfill, in the Auckland region
- Bonny Glen Landfill, in the Manawatu
- Dome Valley, north of Warkworth for which resource consents have been granted.

4.5.2.1. Commentary on Class 1 Landfill Market

The location and ownership of Class 1 landfills has a significant impact on the drivers and opportunities for waste reduction within each district.

For the two district councils that own landfills (Taupō and Waitomo), there are competing drivers at work. On the one hand, TAs have a statutory responsibility under the WMA to minimise waste to landfill. On the other, a reduction in waste to landfill means the landfill is potentially less profitable, or even uneconomic to continue operating. The cost to run these facilities may be a more important factor in their operating life than available air-space and resource consent conditions.

The cost of disposal at large privately owned regional landfills is likely to be considerably less than at smaller facilities, even once transport costs have been factored in. For example, the closest landfill to the Ōpōtiki District Council RTS is Broadlands Road, Taupō (215 km away). However, as the closest large commercial landfill, Tirohia (233 km away) has been able to offer competitive gate fees.

Waitomo District Council has difficult choices in the future as it debates whether to continue to operate its own landfill, or close the facility and use one of the larger commercial landfills. Although the current price of carbon offsets and the transitional provisions costs associated with the ETS are moderate, the potential future implications of the ETS are a key consideration for the TA (see Section 2.2.2.2).

TAs that are some distance from the large disposal facilities have regularly examined the feasibility of local landfill construction, but to date this has not proven viable. Whakatāne District Council had undertaken a cost-benefit analysis of developing a new landfill following the closure of their Burma Road Landfill, but has now negotiated a long-term disposal arrangement with Tirohia, rendering the need for a local landfill obsolete.

An opportunity for collaboration between TAs could be to aim towards tendering joint contracts for bulk transport and disposal of waste. Such combined contracts might prove most cost-effective in natural 'waste catchments', which would allow transport service providers to achieve a reasonable economy of scale. Another option might be for the two smaller landfills to negotiate to accept residual waste from adjoining districts. This would result in better economies of scale for the landfills' operation, albeit at the expense of shortening their lifespan. For those TAs that do not own landfills and are a considerable distance from the nearest landfill, reducing waste is the primary driver. Reducing waste would reduce both transport and disposal costs for the TA. Local composting of organic material could be an opportunity to reduce waste tonnages and transport costs.

However, districts that are in close proximity to a privately owned landfill, or where the transfer stations are privately owned, have fewer opportunities to reduce waste being disposed of to landfill. In these areas, a substantial proportion of the waste stream can be taken directly to landfill by private operators. This means that TAs may not have any opportunity to divert any of this waste to recycling or composting.

Another opportunity could exist in generating new disposal facilities that are not municipal landfills, such as constructing or converting existing local Class 1 facilities to Class 2-5 facilities. If significant efforts were made to divert organic waste from the waste stream, then this would enable large tonnages of relatively inert and low value material to be disposed of locally at a Class 2-5 facilities at a lower cost than at a Class 1 landfill. Smaller tonnages of more harmful (and more costly to manage) waste could then be bulked and shipped to the large Class 1 facilities for disposal. This approach would make use of existing facilities, minimise local costs, and encourage material separation.

4.5.3. Class 2-5 Landfills (Cleanfills, Monofills and Other Disposal Facilities)

There are a large number of cleanfill facilities in the regions, but the exact number is impossible to determine. Not all cleanfills can be identified, particularly in Waikato region, where they may be a permitted activity. There are also a number of unofficial cleanfill operations on farmland and in other isolated locations.

Ownership of the cleanfill market is much more fragmented than the municipal landfill market, with quarry and mine owners, transport operators, and private developers all featuring in the data provided by WRC and BOPRC. Known involvement of major waste operators in the cleanfill/monofill market includes Envirofert's operation in Tuakau and the Puke Coal operation in Waikato District.

4.5.3.1. Commentary on Class 2-5 Market

Class 4 Controlled Fills and Class 5 Cleanfills (and to a lesser extent Class 2/3 landfills) are in direct competition with Class 1 landfills and resource recovery operators for disposal of the portion of the waste stream that complies with their acceptance criteria.

The cost of entry into the Class 4 and Class 5 landfills is substantially lower than into the Class 1 market. Class 4 and 5 landfills require much lower levels of engineering investment to prevent discharges into the environment and have lower consenting and compliance requirements and costs. Because of these differing cost structures, these facilities charge markedly less for disposal than Class 1 landfills, often in the order of 10% of Class 1 landfills' advertised gate charges.

Despite the differences in cost structures, Class 1 landfills sometimes compete with Class 4 and Class 5 landfills for cleanfill, as tonnages are so large. As the cost per tonne of landfilling is very low, a landfill can potentially still make a profit accepting cleanfill material at a price competitive with Class 4 and 5 charges. This is particularly the case for the disposal of natural, virgin excavated soil, which landfills can use for cover material or for site engineering purposes.

An important aspect of the competition between cleanfills and municipal landfills relates to the disposal of contaminated soils. Most Class 1 landfills need to excavate or import material for engineering purposes, such as for daily and final cover of the site. Class 1 landfills are not, however, able to use contaminated soils for engineering purposes as readily as they can clean soils. As a result, gate charges for contaminated soils at landfills may be higher than for cleanfill materials. As there are no rigorous regulatory systems in place for the identification and tracking of materials from contaminated sites, the possibility exists that cleanfills could be used illegally for the disposal of contaminated soils as a cost-saving measure by the waste generator.

The lack of consented Class 4 and Class 5 facilities in some parts of the regions; such as the east Waikato and eastern Bay of Plenty, may encourage the development of positive alternative management options (such as reuse). However, anecdotal evidence suggests that there is also a significant amount of illegal disposal and stockpiling of cleanfill material.

Currently TA's have limited ability to monitor waste flows, measure the effects of waste minimisation initiatives, and report on the amount of waste being disposed of to land, as few of these facilities are required to report the volume of materials being deposited.

There may be some changes in waste management behaviour resulting from the impeding extension of the landfill levy to Class 2-4 fills (see Section 2.2.2.1). However, as the increase in landfill levies will be higher for Class 1 landfills, the net impact will be an increase in the difference between disposal costs at Class 1 landfills and Class 2-4 landfills. Levies do not yet apply to Class 5 landfills and it is unclear exactly how the classification of a facility as a Class 5 landfill will be regulated and enforced.

Previous modelling has shown that landfill levy rates for certain materials, such as construction and demolition waste, would need to reach \$20-\$60[25] before diversion options become cost-competitive.

4.5.4. Transfer Stations

Transfer stations in the regions vary from Refuse Transfer Stations (RTS) that accept a wide range of waste and recyclables to collection and bulking points specifically for certain materials. Collection and bulking points are usually associated with national or cross-regional product stewardship programmes, such as Plasback (see section 4.5.6). A list of the location of all RTS, recycling centres and drop-off facilities across the two regions is available in Appendix A.3.0 along with a summary of the materials that are accepted at each facility.

In general, the two regions appear to be well-supplied with RTS or similar facilities. No TAs identified a need for additional RTS in their WMMPs; although in many cases these facilities are ear-marked for further development to accept a wider range of materials for diversion and to expand reuse options.

There are private transfer stations currently operating in Hamilton, Waipa, Rotorua and Whakatāne districts. While the private transfer station in Waipa District is necessary because the TA does not own that type of infrastructure, the private facilities in the other areas compete directly with TA facilities. Privately owned transfer stations that do not facilitate waste diversion could have the effect of increasing the disposal of waste to landfill and make TA facilities less economically-viable by reducing their waste volumes. These private facilities could also reduce the TAs' ability to monitor and manage waste, as the TAs may not have access to disposal tonnages.

Several RTS now have reuse centres in, or nearby, such as Xtreme Zero Waste in Raglan, the Seagull Centre in Thames, and the CREW Reuse Centre in Whakatāne. There is also an increasing number of collection points for various product stewardship schemes such as the Seatsmart and Paintwise schemes (see Section 4.5.6).

TA-owned RTS represent a proven method for taking direct action to reduce waste to landfill. This can be done through regulatory measures (such as banning the disposal to landfill of particular materials, such as greenwaste, through local bylaws), differential pricing to encourage separation of

[25] Eunomia (2017) The New Zealand Waste Disposal Levy. Potential Impacts of Adjustments to the Current Levy Rate and Structure Final Report, and Eunomia (2019) Waste Levy Impact Study. Reports to Wellington City Council, Hutt City Council, and Porirua City Council on the potential impact of changes to the waste disposal levy

recoverable materials, improving the facility layout to facilitate material separation, and establishing operating contracts that incentivise waste reduction by the contractor.

While specific research into the operation of transfer stations was not conducted for this study, there may be opportunities for TAs and regional councils to cooperate in finding ways for TAs to more fully realise the waste reduction potential of their facilities.

4.5.5. Waste and Greenwaste Disposal Fees

The advertised gate charges for the disposal of waste and greenwaste at the regions transfer stations and landfills are shown in Table 7. The gate charges from 2017 are also listed for comparison.

Table 7: Waste and Greenwaste Disposal Fees, Prices in NZD per tonne (GST included); unless noted otherwise as of May 2021

District	Location	Waste 2017	Waste 2021	Greenwaste 2017	Greenwaste 2021
Waikato Region					
Hamilton City	Lincoln Street RTS	$170	$205/vehicle + over 300kg	N/A	$156/ vehicle + over 300 kg
	Wickham St RTS	N/A	$199	N/A	N/A
Hauraki District	Paeroa	$159.20	$206.50	$111.50	$135
Matamata-Piako District	Matamata, Morrinsville, and Waihou RTS	$154	$245	$69	$130
Ōtorohanga District	Ōtorohanga and Kawhia RTS	$45/m^3	$45/m^3	$30/m3	$30/m^3
South Waikato District	Tokoroa Landfill	$134.50	$166	$73	$76.75
	Putaruru RTS	$40/large trailer	$249	$20/large trailer	$124.50
Taupō District	Broadlands Rd Landfill and all RTSs	$120	$130	$50	$50
Thames-Coromandel District	All RTSs	$170	$260	$85	$164
Waikato District	Raglan RTS	$41/ m^3	$75/m^3	$10/ m^3	$20/m^3
	Te Kauwhata RTS	N/A	$75 single axle trailer	N/A	$45 single axle trailer
	Huntly RTS	$150	$210	$110	$150

District	Location	Waste 2017	Waste 2021	Greenwaste 2017	Greenwaste 2021
Waipa District	Te Awamutu RTS	$171	$208	$149.50	$60/ standard trailer
	Cambridge RTS	N/A	$255	N/A	$197
	Hamilton Organics Centre	N/A	N/A	$61.33 - 82	$199
Waitomo District	Waitomo District Landfill	$185	$212	$125	$143
	All RTS	Charges are per refuse item	Charges are per refuse item	N/A	N/A
Bay of Plenty Region					
Kawerau District	Kawerau RTS	$200	$255	$5/m^3	$10/m^3
Ōpōtiki District	All RTS	$35/1-2 m^3	$55/m^3	$10/m^3	$10/m^3
Rotorua District	Rotorua landfill and all RTS	$153	$178.50	$46	$48
Tauranga City	Te Maunga and Maleme St RTS	$205	$236	$104	$114
Whakatāne District	Whakatāne RC and all public RTS	$242	$242	$57	$57

The gate charges provided in Table 7 are the 'advertised' gate charges, which are charged to casual customers. Private waste collectors and large-scale waste generators are often able to negotiate substantial discounts to these charges.

The advertised gate charges for residual waste disposal in the different areas of Waikato region ranged, per tonne, from $130 (Taupō) to $260 (Thames-Coromandel), with most being in the region of $210 - 240. This is an increase of approximately 40% since the 2017 stocktake. Charges at RTS in the different districts in Waikato region do not seem related to whether the TA owns a landfill.

The gate charges in Bay of Plenty region range from $178.50 to $255 per tonne, generally higher than in Waikato region, particularly in those districts that need to transport waste a considerable distance to a landfill. The exception to these higher charges is Rotorua district, which charges $178.50 per tonne (the remainder are between $236 - $255).

Greenwaste disposal charges, on the other hand, vary significantly between the districts, from a low of $48 in Rotorua to a high of $199 in Hamilton. Although the average greenwaste disposal charges have also increased since the 2017 stocktake, the estimated increase is less than that of the residual waste disposal increase. Greenwaste charges at council-owned facilities are typically around 50% of the refuse charges, while at private facilities there is a smaller differential. This might be a result of

TA facilities charging less for greenwaste to incentivise waste reduction, whereas private facility charges reflect actual costs, including providing returns on private facility investments.

4.5.5.1. Commentary on Disposal Fees

For TAs that control disposal facilities, gate charges can be an important tool to incentivise waste generators to divert waste to more beneficial purposes. With the exception of Taupō District, disposal charges for residual waste in both regions are comparable to charges in most other parts of the country. Moving forward, charges will increase to accommodate the scheduled increases in the landfill levy.

It is uncertain whether landfill disposal charges have reached the level at which waste reduction will be incentivised.

In other countries disposal charges are significantly higher. In the UK, for example, the landfill tax alone is £96.70 per tonne.

4.5.6. Product Stewardship and Take Back Schemes

The key voluntary product stewardship programmes that have a presence in the Waikato and Bay of Plenty regions are shown in Table 8.

Table 8: Product Stewardship and Take Back Schemes in the Waikato and Bay of Plenty Regions (2021)

Material	Agency	Locations
Waste paint	3R and Resene Paints www.resene.co.nz/paintwise	Drop-off at locations that sell paint or transfer stations
Agricultural waste chemicals and plastics	3R and Agrecovery www.agrecovery.co.nz	Drop off or pick up, call for more information
Farm plastics (bailage wrap)	Plasback https://plasback.co.nz	Collects from farms, call to schedule pick up
Child restraints	Seatsmart through agents	Tauranga, Rotorua, Hamilton, Frankton,
Hard to recycle consumer products	Terracycle https://www.terracycle.com/en-NZ	At local collection points (schools, libraries, or send by mail); check website
Electrical and electronic products	TechCollectNZ https://techcollect.nz/drop-off-locations/	Noel Leeming stores in Hamilton, Tauranga, and Rotorua
Electrical and electronic products	South Waikato Achievement Trust	Drop-off in Tokoroa
Swappa crate (beer bottles and crates)	The Associated Bottlers Co Ltd	Virtually every liquor store
Household Polystyrene Recycling Programme	EXPOL https://www.expol.co.nz/recycling-programmes/	Mitre10 stores in: Cambridge, Rotorua, Tauranga, Ruakura, Te Rapa

As described in Section 2.2.2.1, government has declared priority products for regulated product stewardship. Most of these are currently in the process of having a national scheme designed.

4.5.7. Recycling Centres and Drop-off Facilities

There are a number of recycling centres and drop-off facilities in Waikato and Bay of Plenty regions. These are listed in Appendix A.3.0, along with RTS.

Drop-off and recycling centres are more commonly provided by TAs in larger districts with areas of sparse population. While few issues with provision of these services were highlighted in waste assessments or WMMPs, the service provision for rural households is an area where further attention may be required.

4.5.8. Processing Facilities

This section discusses all diverted material processing facilities, ranging from material recovery facilities (MRFs) where dry recyclables/commodities are sorted and bulked for transport, and facilities outside the regions where recyclables are processed.

Processing facilities are generally divided into distinct markets according to material types - fibre (paper/cardboard), organics, glass, metal, and plastics. The major local processors of the different material types, such as Visy Glass and OI (fibre), tend to have a dominant position in each marketplace.

The diverted materials market is integrated with an international market. Many local collectors and processors of recovered materials sell their materials through international secondary materials market. While low-volume, high-value materials such as metals and certain types of plastics have been exported for many years, lower-value materials such as paper, glass, and low value plastics have at times been exported as well. The extent of this is dependent on the state of local and international markets, and is largely reflective of the national situation:

- Plastics - While grades #1 and #2 are readily recyclable in New Zealand, reprocessors have strict quality standards (for example with reference to meat trays) and are currently constrained by the end markets for their products. Other collected plastics are generally exported for recycling, such as #5 (where this is collected) and most agricultural plastic waste such as plastic film.
- Fibre - most mixed fibre collected from householders at kerbside is exported for re-processing. These markets are reasonably stable, but are becoming more strict on contamination levels.
- Metal - export market prices for diverted metals are currently higher than they have been in the last 5-10 years, as global supply of product has been affected by COVID-19. However, shipping logistics are making it more difficult to reach international markets.

While there are domestic processing options available for many waste streams, particularly electrical and electronic, organics, glass and high-quality fibre tend to be located closer to large population centres. As a result, the northern Waikato region is well-served with a wide range of options that also serve the Auckland region. Some other areas, such as those in the southern Waikato region, have options for some diverted materials (fibre) but not others (glass).

The organic processing options have generally been developed in conjunction with the large horticultural and wood processing industries. Other organic processing facilities in Waikato region have been principally developed to service the Auckland market, but also serve the northern Waikato region. A detailed list of organic processing facilities is provided in A.13.0.

4.5.9. TA Access to Waste to Landfill

TAs use a range of methods to reduce waste to landfill. These include regulatory control, such as through bylaws and resource consents, education, and action through initiatives that directly reduce the waste stream. Waste must be accessible by the TA for them to directly affect a waste stream. In this context 'TA access' to the waste stream means that the TA or its contractors physically control the waste at some point between collection and landfill disposal and may, as a result, be able to effect some sort of change to that waste. This 'access' can be in the form of waste collected through a TA-contracted kerbside collection, waste that passes through a TA-controlled RTS, or waste that is disposed of at a council-owned landfill.

Waste that is totally controlled by the private sector includes waste that goes from a privately-owned transfer station to a privately-owned landfill or waste that goes directly to a landfill that is owned privately or in another district.

4.5.10. TA Access to Overall Waste Stream

Using the data provided by TAs and collected from other sources, an approximate degree of 'access' has been estimated for each of the TAs in Waikato and Bay of Plenty regions. These estimates are presented in Table 9, and are based on the best information available at the time of writing. As many of the TAs are not able to access reliable data relating to privately controlled waste, and there are potentially transboundary movements of waste of which the TAs are not aware, the accuracy of these estimates is uncertain.

For a TA to have 'access' to the waste stream the TA or its contractors must physically control the waste at some point between collection and landfill. Therefore, if a TA owns only the landfill in a district and all waste from the district is disposed of at that landfill, TA has 'access' to 100% of the waste. By contrast, a TA that does not have control of a transfer station or landfill, but provides a kerbside rubbish collection, only has 'access' to the kerbside rubbish it collects.

'Private control', on the other hand, means that TA has no physical access to the waste at any point between collection and disposal. Special wastes are excluded from the analysis, as are minor council-controlled waste streams such as litter bins and illegal dumping.

TA access to the overall waste stream (see Section 5.1.1 for a definition of the 'overall waste stream') varies from 0 to 100%, as can be seen in Table 9.

Table 9: TA Access to Overall Waste Stream, 2021

Territorial authority access to overall waste stream	% of overall waste stream accessible	Elements accessible by TAs
Waikato region		
Hamilton City	<50%	Kerbside rubbish, transfer station
Hauraki District	80%	Kerbside rubbish, transfer stations
Matamata-Piako District	40%	Kerbside rubbish, transfer stations
Ōtorohanga District	15%	Kerbside rubbish, transfer stations
South Waikato District	75%	Kerbside rubbish, transfer station
Taupō District	100%	Kerbside rubbish, transfer station, landfill
Thames-Coromandel District	85%	Kerbside rubbish, transfer stations
Waikato District	50%	Kerbside rubbish, transfer stations
Waipa District	0%	No TA services or infrastructure
Waitomo District	100%	Kerbside rubbish, landfill
Bay of Plenty region		
Kawerau District	100%	Kerbside rubbish, landfill
Ōpōtiki District	75%	Kerbside rubbish, transfer station
Rotorua District	40%	Kerbside rubbish
Tauranga City	95%	Kerbside rubbish, transfer stations
Western Bay of Plenty District	70%	Kerbside rubbish
Whakatāne District	35%	Kerbside rubbish, transfer stations

4.5.11. TA Access to Kerbside Rubbish

Using the data provided by TAs and collected from other sources, such as waste assessments and Solid Waste Analysis Protocol (SWAP) surveys, an approximate degree of 'access' to the kerbside rubbish stream has been estimated for each of the TAs in Waikato and Bay of Plenty regions. The 'kerbside rubbish stream' includes collections of wheelie bins and bags from both residential and commercial premises by both TAs and private collectors. These estimates are presented in Table 10. Any kerbside rubbish to which a TA has no access is collected privately and disposed of at a facility to which the TA has no access.

Table 10: TA Access to Kerbside Rubbish Stream 2021

Territorial authority access to kerbside rubbish	% of kerbside rubbish stream accessible
Waikato region	
Hamilton City	95%
Hauraki District	53%
Matamata-Piako District	29%
Ōtorohanga District	Unknown (~15%)
South Waikato District	40%
Taupō District	20%
Thames-Coromandel District	75%
Waikato District	80%
Waipa District	0%
Waitomo District	Unknown (~50%)
Bay of Plenty region	
Kawerau District	95%
Ōpōtiki District	51%
Rotorua District	90%
Tauranga City	100%
Western Bay of Plenty District	80%
Whakatāne District	56%

The TA access to kerbside rubbish varies from 0% in Waipa, where the TA does not provide a kerbside rubbish collection, to 100% in Tauranga City. Ultimately, the degree of access is associated with the proportion of properties that receive a TA kerbside rubbish collection service, the proportion of properties that use private collectors' services, and whether or not the TA operates a transfer station or landfill.

In 2021, Tauranga City Council introduced a rates-funded kerbside rubbish wheelie bin collection replacing its user-pays rubbish bag collection. Also in July 2021, Western Bay of Plenty District Council, introduced a pay-as-you-throw rubbish wheelie bin collection. These changes will result in an increase in the percentage of kerbside rubbish accessible to those TAs. This has been reflected in Table 10.

5. QUANTITY AND COMPOSITION OF WASTE AND DIVERTED MATERIALS

5.1. Methodology

The collection of waste and recycling data is a challenging task. There are a wide range of organisations involved and much of the data that is collected is commercially sensitive. Issues with the definition of waste (when considering which recovered or diverted materials should be included or not) and the ease of movement of waste across local and regional boundaries makes the task of collating meaningful data even more complex.

The data presented in this report is nominally labelled as being for 2020. The data used to calculate 2020 tonnages is the most recent data available but is not necessarily from 2020. This is the same methodology as has been used in past stocktakes.

For this report, information regarding waste flows and quantities has been aggregated at a regional level and was collected from a wide range of sources including:

- various waste management reports from the two regions, including previous waste stocktake reports;
- waste assessments and WMMPs from all TAs in the regions;
- WRC for information on Hampton Downs and Tirohia landfills;
- questionnaires issued to waste officers from TAs within regions (see Appendix A.7.0);
- MfE for waste to landfill for the Waikato and Bay of Plenty regions, based on data from the MfE's online waste levy system;
- through recent interviews conducted with waste producers, waste processors, disposers, and key stakeholders;
- studies on farm waste in both the Waikato and Bay of Plenty regions, and Canterbury[26]; and
- estimates based on available information on land disposal sites, including consented limits for major disposal sites.

Information regarding the composition of waste disposed of to landfill has been aggregated from:

- composition of waste to landfill from SWAP survey results from various districts within the regions;
- composition of waste to landfill for specific facilities.

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

- the quantity of waste disposed of by TAs to Class 1 landfills;
- the quantity of commodities collected and recycled by TAs;
- in some instances, the composition of waste collected by TAs;

[26] GHD (2013) *Non-natural rural wastes - Site survey data analysis*, Environment Canterbury Report No.R13/52 and GHD (2014) *Rural Waste Surveys Data Analysis Waikato & Bay of Plenty*, Waikato Regional Council Technical Report 2014/55

- in some instances, the composition of waste disposed of to Class 1 landfills.

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

- the quantity of diverted materials other than commodities;
- the quantity of farm waste;
- the quantity of waste disposed of to cleanfills.

5.1.1. Classification of Waste Streams

As different waste streams require different management strategies, a standardised system for classifying waste streams was developed for the National Waste Data Framework[27]. This system is used for the presentation of the data in the following sections.

'Overall waste', in this report, refers to all waste that is disposed of at a Class 1 landfill and is subject to the waste levy. 'Diverted materials' entering landfills, such as waste used for road engineering purposes or final cover material, is not subject to the waste levy and not included in this report.

'Overall waste' is broken down, in this report, into three waste streams - general waste, kerbside rubbish, and special wastes (such as biosolids and contaminated soils). 'General waste' is further broken down into four 'activity sources' - construction & demolition, industrial/commercial/ institutional, landscaping, and residential. These activity sources are defined in the glossary.

A generic waste flow diagram that illustrates this system for classifying waste streams is shown below in Figure 3.

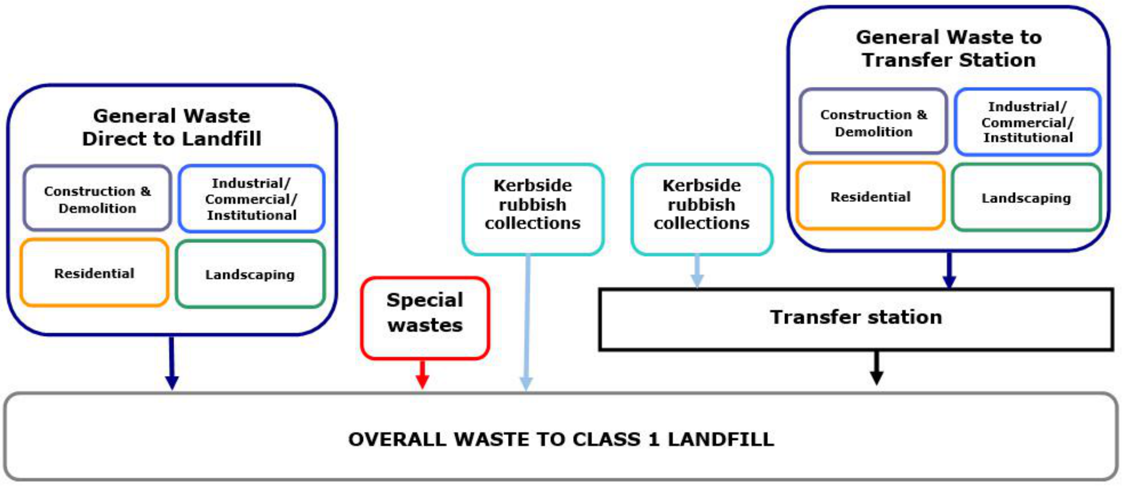

Figure 3: Classification of Waste Streams

In sections 5.2 and 5.3, data is provided on the composition of overall waste to Class 1 landfills, general waste to Class 1 landfills, the individual activity sources of general waste, and kerbside rubbish.

[27] http://www.wasteminz.org.nz/wp-content/uploads/National-Waste-Data-Framework-Combined-Protocols-FINAL.pdf

Composition data on these waste streams has been provided to assist with the identification of waste minimisation opportunities and the planning of waste minimisation initiatives. It is important to provide data that is both reliable and with the appropriate level of granularity.

Data on the composition of the overall waste stream has relatively few uses for waste management planning. It is, however, frequently used in educational campaigns and is required for the calculation of greenhouse gas emissions from waste disposal.

The composition of the general waste stream, and of the individual activity sources, is of value because the general waste stream is an important, discrete component of waste that is disposed of at transfer stations and landfills. Composition data for general waste and its activity sources, allow TAs and private industry to effectively plan for the reduction of waste entering their facilities. For instance, the assessment of a construction and demolition waste recovery operation at a transfer station is dependent on reliable data on the tonnage and composition of C&D waste.

Composition data on kerbside rubbish is valuable because kerbside recycling and organic collections are the main waste reduction initiatives used by many TAs. It is important that the TAs have sufficiently granular data on the composition of kerbside rubbish to introduce and improve these systems. A TA that is considering the introduction of a kerbside organic collection, for instance, is reliant on accurate data on the quantity of organic material being disposed of through kerbside rubbish.

5.2. Waste to Class 1 Landfills

5.2.1. Tonnage of Waste to Class 1 Landfills- by Region

An estimate of the total annual tonnage of waste originating from Waikato and Bay of Plenty regions, and disposed of to Class 1 landfills, is provided in Table 11. The estimate includes special wastes but does not include waste that originates from outside the regions.

Table 11: Tonnage of Waste to Class 1 Landfills - by Region - 2020

Overall waste to Class 1 landfills	Tonnes per annum	% of total weight
Waikato region	308,885	64%
Bay of Plenty region	174,495	36%
TOTAL	**483,380**	**100%**
Note: Quantities reported are from disparate time periods and include special wastes		

5.2.2. Activity Sources of Waste to Class 1 Landfills

The overall tonnage of waste to landfill has been divided into three waste streams in Table 9 - kerbside rubbish, general waste, and special wastes. ‘Kerbside rubbish’ includes all rubbish collected from both residential and commercial properties by both TA and private kerbside waste collections. ‘Special’ wastes include biosolids and road sweepings from TA sources and potentially hazardous materials, such as asbestos-contaminated soil, from other sources. ‘General’ waste is all waste to Class 1 landfills that is neither kerbside rubbish nor a special waste and is broken down into four activity sources in the table.

These activity sources align with those in the National Waste Data Framework and are shown as subsets of the General waste category in Table 12 and Figure 4.

Table 12: Activity Sources of Waste to Class 1 Landfills - 2020

Activity sources of waste to Class 1 landfills – Waikato and Bay of Plenty regions combined	% of waste	Tonnes per annum
Construction & demolition	17%	83,538
Industrial/commercial/institutional	30%	146,314
Landscaping	5%	21,772
Residential	7%	32,889
Subtotal - General waste	**59%**	**284,513**
Kerbside rubbish	28%	135,663
Special waste	13%	63,204
TOTAL (Overall waste)	**100%**	**483,380**
Note: Quantities reported are from disparate time periods		

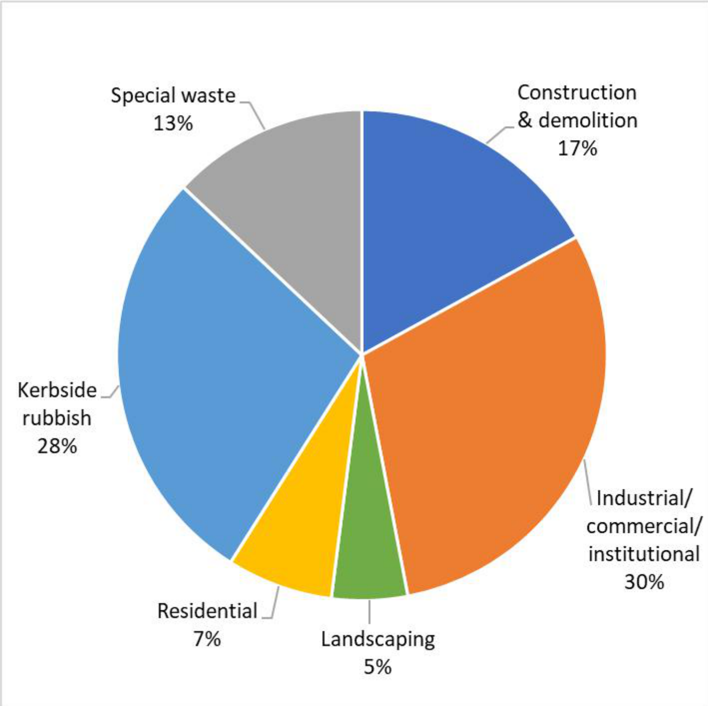

Figure 4: Overall Waste to Class 1 Landfills, by Activity Source, Waikato and Bay of Plenty Regions, 2020

Of the total quantity disposed of to landfill Industrial/commercial/institutional waste and kerbside rubbish were the largest components. Special waste comprised 13% and included biosolids, shredder floc, contaminated soils, and heavy metal ash.

A comparison of activity source data of waste to Class 1 landfills in 2020 to the comparable data from the 2017 Stocktake, is provided in Figure 5 and in Appendix A.8.0.

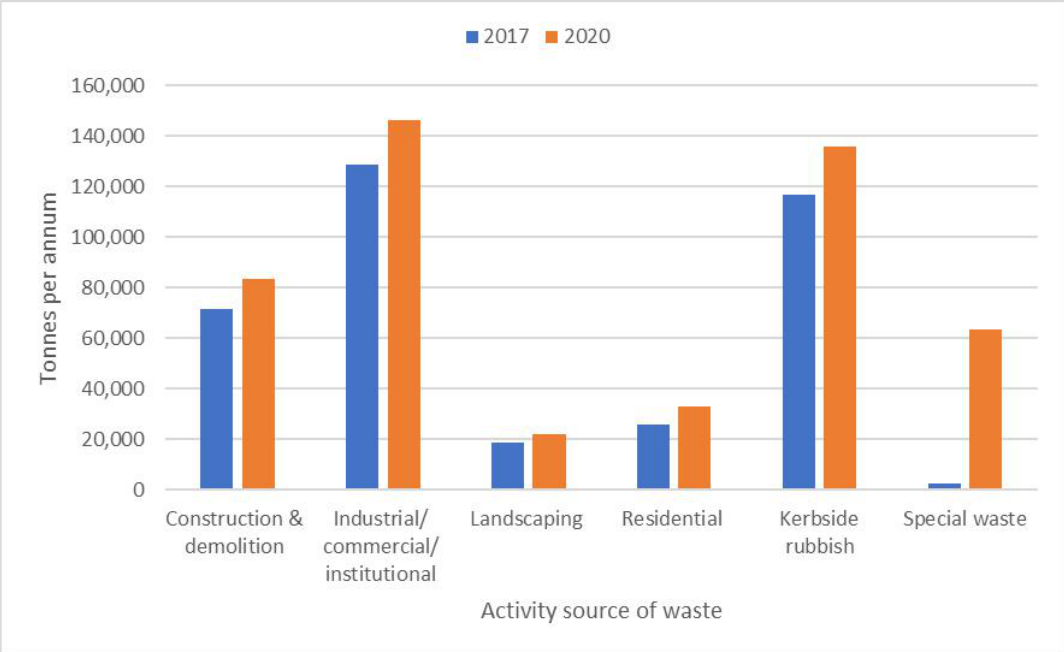

Figure 5: Activity Sources of Waste to Class 1 Landfills - 2017 Compared to 2020

The apparent increases in waste tonnages are not considered to be an accurate measure of an actual change in waste tonnage, but are likely to be associated with more accurate reporting of waste data. A proportion of the data provided by TAs for the 2017 Stocktake report omitted tonnages collected privately that did not pass through council-owned facilities at any point. These privately controlled tonnages have been included in the 2021 Stocktake, based on information from a range of sources. The increase in special waste is largely due to better quality data having been made available for the 2021 Stocktake report.

5.2.3. Per Capita Disposal of Waste to Class 1 Landfills

Using population data for 2020 that has been interpolated from Stats NZ "2018-2048 sub-national population estimates", per capita disposal rates of waste to Class 1 landfills have been calculated. Per capita rates are a useful measure to show differences in waste generation in regions with different population bases. These rates do not refer to how much waste is generated per person, but rather provide a standardised unit to compare how much general or overall waste is generated in each region. The results are shown in Table 13.

Table 13: Per Capita Disposal of Waste to Class 1 Landfills, 2020

Waste to Class 1 landfills - Per capita disposal rates	Waikato	Bay of Plenty	Both regions combined	Average of both regions
Population - 2020	489,560	393,345	**882,905**	-
Tonnes per annum of general waste	185,682	100,276	**285,958**	-
Tonnes/capita/annum of general waste	**0.379**	**0.255**	-	**0.324**
Tonnes per annum of overall waste - excluding special waste	257,800	162,376	**420,176**	-
Tonnes/capita/annum of overall waste - excluding special waste	**0.527**	**0.413**	-	**0.476**
Tonnes per annum of overall waste - including special waste	308,885	174,495	**483,380**	-
Tonnes/capita/annum of overall waste - including special waste	**0.631**	**0.444**	-	**0.547**

For general waste, the per capita figure in the Waikato region is nearly 50% higher than in Bay of Plenty region. This is expected to be associated with the significant manufacturing and commercial base of the economy in Hamilton, the largest city within the two regions.

5.2.3.1. Comparison of Per Capita Disposal Rates to Other TAs

Waste Not Consulting has undertaken studies of waste disposal in several national local authority areas, generating comparable per capita disposal rates for the overall waste stream to landfill. In Table 14, disposal rates for the overall waste stream from a number of other local authorities are compared to those in Waikato and Bay of Plenty regions. These figures include special wastes.

Table 14: Per Capita Disposal of Waste to Class 1 Landfills - Comparison to Other Areas

Comparison of per capita disposal rates of waste to Class 1 landfills	Tonnes per capita per annum
Gisborne District 2017	0.296
Waimakariri District 2017	0.325
Bay of Plenty Region 2020	**0.444**
Invercargill City 2018	0.528
Palmerston North 2017	0.545
Kāpiti Coast District 2017	0.546
Dunedin City 2018	0.554
Wellington Region 2016	0.608
Napier/Hastings 2019	0.630
Waikato Region 2020	**0.631**
New Zealand (to September 2020)*	0.663
Taupō District 2017	0.673
Hamilton City 2017	0.718
Queenstown Lakes District 2020	0.833
Auckland Region 2016	**1.053**
*Note: * https://www.mfe.govt.nz/waste/waste-guidance-and-technical-information/waste-disposal-levy/monthly-levy-graph*	

The per capita disposal rate for Bay of Plenty region is lower than many of the other areas that have been analysed while the rate for Waikato region is similar to the rate for New Zealand as a whole. Contributing factors to the differences in the disposal rates include differences in the level and type of economic activity in an area. For example, agricultural activity generates less waste to Class 1 landfills than manufacturing, partly because a high proportion of farm waste is disposed of on-site.

5.2.4. Change Over Time in Waste Quantities to Class 1 Landfills

Waste to Class 1 landfills from Waikato and Bay of Plenty regions has been quantified in three previous reports prepared for the regional councils:

- 2007 - SKM - *Waste Infrastructure Review and Strategic Assessment*, and *Waikato Regional Waste Infrastructure Stocktake and Strategic Assessment*
- 2013 - Eunomia Research & Consulting and Waste Not Consulting - *Bay of Plenty and Waikato Regions Waste Stocktake*
- 2017 - Eunomia Research & Consulting - *Bay of Plenty and Waikato Regions Waste Stocktake*

Table 15 shows the estimated quantities of waste to Class 1 landfills and per capita disposal rates as recorded in this stocktake compared to the three prior stocktake reports.

Table 15: Change Over Time of Waste to Class 1 Landfills

Changes over time of waste to Class 1 landfills	2007	2013	2017	2020
Tonnes per annum to Class 1 landfills				
Waikato	222,000	226,887	220,741	308,885
Bay of Plenty	199,000	127,193	143,523	174,495
TOTAL - Both regions	**421,000**	**354,080**	**364,264**	**483,380**
Tonnes per capita per annum				
Waikato	0.572	0.562	0.491	0.631
Bay of Plenty	0.763	0.494	0.493	0.444
Both regions combined	**0.649**	**0.536**	**0.492**	**0.547**

The quantity of waste disposed of to Class 1 landfills from Waikato and Bay of Plenty regions varies considerably between four stocktake reports. However, as the sources and reliability of the data used for the estimates have also varied, the reliability of the overall tonnages cannot be assessed.

The 2007 figure for Bay of Plenty (199,000 tonnes) appears to be anomalous, or at least unexplained. The 2007 report shows a 31% increase in Bay of Plenty waste to landfill between 2002 and 2006, for which no explanation is provided.

The large increase in disposal from Waikato region between 2017 and 2021 is largely due to an increase in special wastes. This increase is associated with a more complete dataset being made available, on a confidential basis, for this stocktake.

5.2.5. Composition of Waste to Class 1 Landfills

The compositions of the general and overall waste streams disposed of to landfill from Waikato and Bay of Plenty regions have been calculated using the results of SWAP audits undertaken since 2017 in four of the 16 TA areas. These SWAP audits represent 62% of the 420,176 tonnes (excluding special waste) disposed of annually to landfill from the two regions. While the results of SWAP audits are available for some of the other TAs, the overall data was considered to be out-of-date and not according to minimum requirements.

As outlined in Section 5.1.1, overall waste refers to all waste that is disposed of at a Class 1 landfill and is broken down into three waste streams - general waste, kerbside rubbish, and special wastes (such as biosolids and contaminated soils). General waste is all material (other than kerbside rubbish and special wastes), that is delivered to RTS and landfills (by households and businesses).

The primary compositions of general waste and overall waste to Class 1 landfills from Waikato and Bay of Plenty regions is presented in Table 16, Figure 6 and Figure 7. All special wastes[28] have been classified as potentially hazardous.

[28] See the Glossary for more information in what is included in special waste.

As the datasets for the individual regions are relatively small, separate compositions for the two regions have not been included. Waste from outside the regions is not included.

The composition of General waste by Activity Source (C&D waste, industrial/ commercial/ institutional waste, residential waste (which excludes kerbside rubbish), and landscaping waste) is provided in Appendix A.9.0. The secondary compositions of the General waste and Overall waste, which include all 25 classifications, are provided in Appendix A.10.0.

Table 16: Primary compositions of Waste to Class 1 Landfills - 2020

Primary composition	Waste to Class 1 Landfill in Waikato and Bay of Plenty Regions in Tonnes per annum and % of total			
	General waste - excludes kerbside rubbish and special wastes		Overall waste - includes general waste, kerbside rubbish, and special wastes	
Paper	24,010	8.4%	36,920	7.6%
Plastics	38,425	13.5%	54,023	11.2%
Organics	40,786	14.3%	106,553	22.0%
Ferrous metals	11,014	3.9%	13,712	2.8%
Non-ferrous metals	1,855	0.7%	3,314	0.7%
Glass	6,011	2.1%	11,025	2.3%
Textiles	29,720	10.4%	35,181	7.3%
Sanitary paper	7,872	2.8%	23,036	4.8%
Rubble & concrete	38,440	13.5%	43,980	9.1%
Timber	77,283	27.2%	80,078	16.6%
Rubber	4,898	1.7%	5,576	1.2%
Potentially hazardous	4,198	1.5%	69,981	14.5%
TOTAL	**284,513**	**100.0%**	**483,380**	**100.0%**
Note: Due to rounding, some totals may not correspond with the sum of the separate figures.				

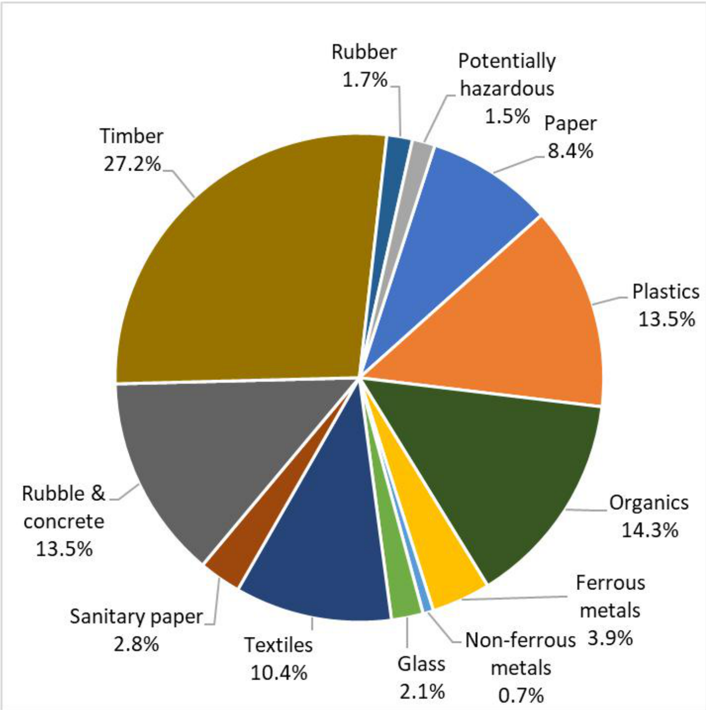

Figure 6: Composition of 'General waste' to Class 1 landfills from Waikato and Bay of Plenty regions, 2020

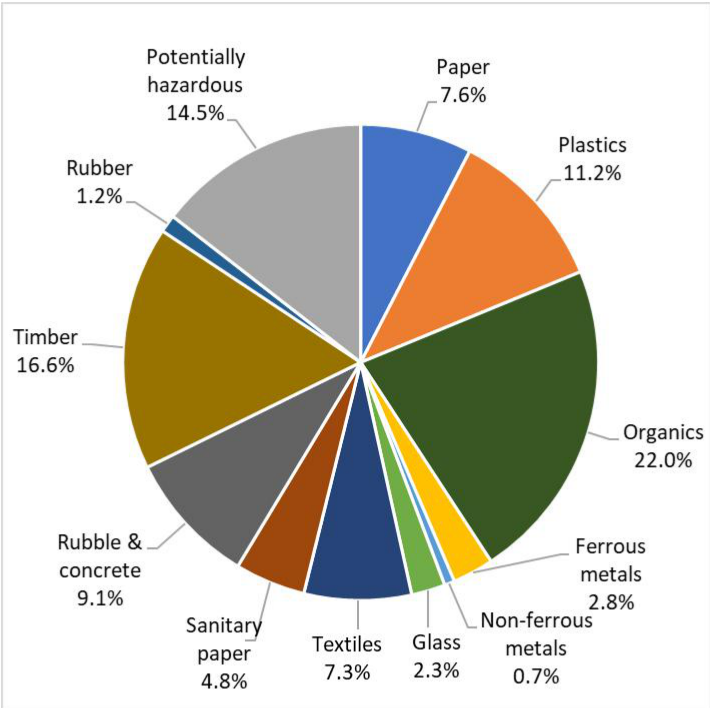

Figure 7: Composition of 'Overall waste' to Class 1 landfills from Waikato and Bay of Plenty regions, 2020

The largest component of overall waste (which includes general waste, kerbside rubbish, and special wastes) was organic waste, which comprised 22.0% of the total weight. Over 40% of the tonnage of organic material in overall waste is kitchen waste from kerbside rubbish collections.

5.2.6. Diversion Potential of Waste to Class 1 Landfills

Of the 25 secondary classifications of the composition of Class 1 landfills, nine are commonly recyclable or recoverable in New Zealand. A further four materials are compostable. There are currently diversion options available in both regions for most of these 13 materials. In addition to the individual materials previously quantified in this report, the overall waste to Class 1 landfills includes 32,093 tonnes per annum of sewage sludge, which is classified as “Potentially hazardous”. Sewage sludge can potentially be diverted from landfill by several methods.

Based on these 14 materials, Table 17 shows the proportion of the general and overall waste streams disposed of to Class 1 landfills that could potentially be diverted from disposal. The percentages and tonnages (other than those for sewage sludge) have been taken from Appendix A.10.0.

Table 17: Diversion Potential of Waste to Class 1 Landfills

Diversion potential of waste to Class 1 landfills - both regions combined - 2020	Tonnes per annum and % of total			
	General waste - excludes kerbside rubbish and special wastes		Overall waste - includes general waste, kerbside rubbish, and special wastes	
Recyclable and recoverable materials				
Paper - Recyclable	5,944	2.1%	14,595	3.0%
Paper - Cardboard	13,284	4.7%	14,245	2.9%
Plastic - Recyclable	1,586	0.6%	4,955	1.0%
Ferrous metals	11,014	3.9%	13,712	2.8%
Non-ferrous metals	1,855	0.7%	3,314	0.7%
Glass - Recyclable	2,353	0.8%	6,343	1.3%
Textiles - Clothing	5,583	2.0%	8,684	1.8%
Rubble - Cleanfill	11,978	4.2%	11,978	2.5%
Timber - Reusable	7,275	2.6%	7,275	1.5%
Subtotal	**60,872**	**21.4%**	**85,100**	**17.6%**
Compostable materials				
Kitchen waste	15,627	5.5%	57,267	11.8%
Compostable greenwaste	17,853	6.3%	35,719	7.4%
New plasterboard	7,657	2.7%	7,657	1.6%
Untreated/unpainted timber	13,421	4.7%	13,421	2.8%
Sewage sludge	0	0.0%	32,093	6.6%
Subtotal	**54,557**	**19.2%**	**146,157**	**30.2%**
TOTAL - Potentially divertable	**115,429**	**40.6%**	**231,257**	**47.8%**
Note: Due to rounding, some totals may not correspond with the sum of the separate figures.				

Approximately 47.8% of the overall waste stream disposed of at Class 1 landfills from the Waikato and Bay of Plenty regions could be readily diverted either by recycling/recovering or by composting. Recyclable/recoverable materials accounted for 17.6% of overall waste and compostable materials 30.2%.

The diversion rates presented in this section are theoretical maximums, as recovery systems are not capable of diverting 100% of a material from landfill disposal and some recovered materials may be in a condition that makes them unsuitable for diversion.

5.3. Kerbside Rubbish

5.3.1. Tonnage of Kerbside Rubbish

Table 18 provides an estimate of the tonnage of kerbside rubbish disposed of to Class 1 landfills from Waikato and Bay of Plenty regions. The data used to calculate the estimate has primarily been drawn from the information provided by TAs, in their role as providers of kerbside rubbish collections to residents. Data on private collections of kerbside rubbish has been gathered from a number of SWAP surveys at landfills and transfer stations in the regions. As the data from the individual TAs relates to different time periods, the tonnages do not represent a specific year.

Table 18: Tonnage of Kerbside Rubbish (2020)

Kerbside rubbish - includes TA and private collections (2020)	Tonnes per annum	% of total weight
Waikato region	72,894	54%
Bay of Plenty region	62,769	46%
TOTAL	**135,663**	**100%**

5.3.2. Per Capita Disposal of Kerbside Rubbish

Using population figures from Stats NZ 2018-2048 sub-national population estimates, per capita disposal rates of kerbside rubbish have been calculated. The results of the calculations are shown in Table 19.

Table 19: Per Capita Disposal of Kerbside Rubbish - 2020

Kerbside Rubbish - Per capita disposal rates - 2020	Waikato	Bay of Plenty	Total
Population - 2020	489,560	393,345	**882,905**
Tonnes per annum of kerbside rubbish	72,894	62,769	**135,663**
Kg/capita/annum of kerbside rubbish	149	160	-

The kerbside rubbish per capita figure for the Bay of Plenty region is 7% higher than for the Waikato region. On average, approximately 154 kilograms of kerbside rubbish are disposed of per year for every resident of the Waikato and Bay of Plenty regions. As the annual tonnage figures for kerbside rubbish are based on extrapolations from weighbridge records for shorter time periods, the accuracy of the per capita figures is uncertain.

5.3.2.1. Comparison of Per Capita Disposal Rates to TAs in Other Regions

Waste Not Consulting has undertaken studies of waste disposal in several local authority areas that have generated per capita disposal rates for kerbside rubbish. In Table 20, disposal rates for kerbside rubbish from a number of local authorities around the country are compared to those in Waikato and Bay of Plenty regions. Per capita disposal rates for kerbside rubbish are available for three TA's in the Waikato and Bay of Plenty regions, which are also included.

These figures, in some instances, include kerbside rubbish collected from commercial properties.

Table 20: Per Capita Disposal of Kerbside Rubbish - Comparison to Other Areas - 2020

Comparison of per capita disposal rates of kerbside rubbish - 2020	Kilograms per capita per annum	Principal kerbside rubbish collection services
Christchurch City 2011	110	Rates-funded fortnightly 140-litre wheelie bins (with weekly organic)
Gisborne District 2017	122	Rates-funded rubbish bag stickers
Whangarei District 2017	153	User-pays rubbish bags + private wheelie bins
Waikato Region 2020	**154**	**Various**
Auckland Council 2016	156	User-pays rubbish bags + rates-funded wheelie bin + private wheelie bins
Bay of Plenty Region 2020	**160**	**Various**
Dunedin City 2018	187	User-pays rubbish bags + private wheelie bins
Tauranga and WBOP District 2019	192	User-pays rubbish bags + private wheelie bins
Hamilton City 2017	197	Rates-funded bags (2 per h/h max)
Wellington Region 2014/15	206	User-pays rubbish bags + private wheelie bins
Palmerston North 2017	201	User-pays rubbish bags + private wheelie bins
Hastings District/Napier City 2019	221	Rates-funded bags (2 bags h/h max) + User-pays rubbish bags + private wheelie bins

The per capita disposal rates of kerbside rubbish for Waikato and Bay of Plenty regions are similar to several other areas. A range of factors affect the disposal rate, including the recycling options available to residents, the volume of waste receptacles for rates-funded services, the proportion of properties that are used for holiday homes or short-term rentals, and the proportion of commercial properties that use kerbside services for rubbish disposal.

As the annual tonnage figures for kerbside rubbish are based on extrapolations from weighbridge records for shorter time periods, the accuracy of the per capita figures is uncertain.

5.3.3. Composition of Kerbside Rubbish

Since the 2017 Stocktake report, sort-and-weigh audits of kerbside rubbish have been undertaken for seven TAs in Waikato and Bay of Plenty regions. Kerbside rubbish disposed of by these TAs represents 81% of all kerbside rubbish from the regions. Based on these audits, the primary composition of all kerbside rubbish collected in Waikato and Bay of Plenty regions is presented in

Table 21 and Figure 8. The secondary composition, which includes all 23 classifications used for the audits, is provided in Appendix A.11.0.

Table 21: Composition of Kerbside Rubbish from Both Regions - 2020

Primary composition of kerbside rubbish from both regions - 2020	Tonnes per annum and % of total	
Paper	12,909	9.5%
Plastics	15,598	11.5%
Organic	65,767	48.5%
Ferrous metals	2,698	2.0%
Non-ferrous metals	1,459	1.1%
Glass	5,014	3.7%
Textiles	5,462	4.0%
Sanitary paper	15,164	11.2%
Rubble & concrete	5,540	4.1%
Timber	2,795	2.1%
Rubber	678	0.5%
Potentially hazardous	2,579	1.9%
TOTAL	**135,663**	**100.0%**
Note: Due to rounding, some totals may not correspond with the sum of the separate figures.		

Based on the results of the seven sort-and-weigh audits, organics was the largest primary classification of kerbside rubbish, comprising 48.5% of the total weight. Kitchen waste comprised 63% of the organic material.

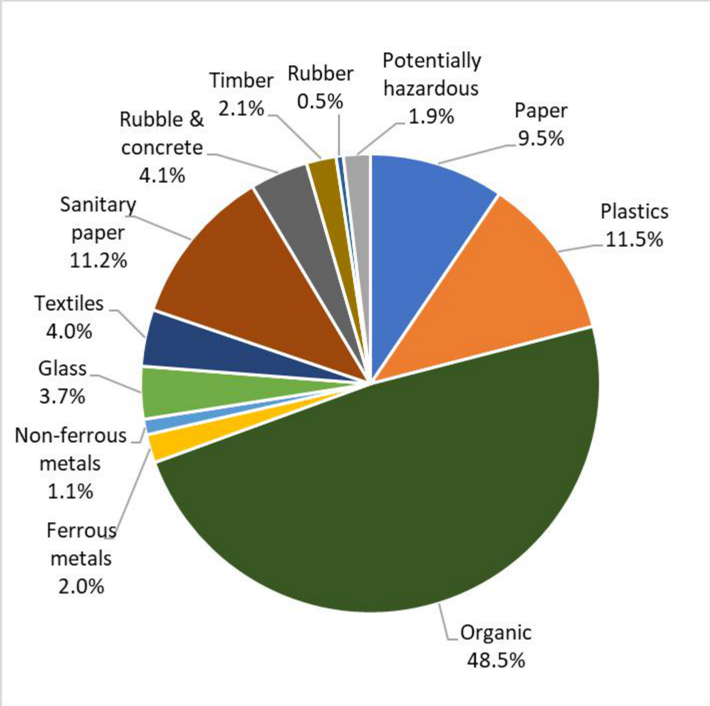

Figure 8: Composition of Kerbside Rubbish from Both Regions - 2020

5.3.4. Diversion Potential of Kerbside Rubbish

In the sort-and-weigh audits used to calculate the composition of kerbside rubbish, secondary categories were used to differentiate between recoverable and non-recoverable materials (e.g. recyclable paper vs. non-recyclable paper). In this context, 'recoverable' is taken to mean materials which can be readily diverted by residents, through kerbside recycling and organic collections, drop-off facilities, or through home-composting.

Using the results of the seven SWAP audits of kerbside rubbish conducted in Waikato and Bay of Plenty regions since the 2017 Stocktake, the diversion potential of kerbside rubbish has been calculated to be as shown in Table 22.

Table 22: Diversion Potential of Kerbside Rubbish - 2020

Diversion potential of kerbside rubbish from both regions - 2020	Tonnes per annum and % of total	
RECYCLABLE MATERIALS		
Paper recyclable	9,612	7.1%
Plastic - #1-7 containers	3,368	2.5%
Steel cans	1,165	0.9%
Aluminium cans	511	0.4%
Glass bottles & jars	3,990	2.9%
Subtotal	**18,646**	**13.7%**
COMPOSTABLE		
Kitchen waste	41,640	30.7%
Greenwaste	19,852	14.6%
Subtotal	**61,492**	**45.3%**
TOTAL DIVERTABLE	**80,138**	**59.1%**
Non-divertable	55,525	40.9%
TOTAL KERBSIDE RUBBISH	**135,663**	**100.0%**
Note: Due to rounding, some totals may not correspond with the sum of the separate figures.		

In total, 59.1% of kerbside rubbish, 80,138 tonnes per annum, could have been diverted by residents from landfill disposal. Organic materials that could have been composted comprised 45.3% of kerbside rubbish. Kitchen waste comprised 30.7% of kerbside rubbish (41,640 tonnes per annum), and greenwaste 14.6% (19,852 tonnes per annum). There was significantly more greenwaste in kerbside collections using wheelie bins than in those using rubbish bags.

Approximately 13.7% of kerbside rubbish from Waikato and Bay of Plenty regions could have been readily diverted through kerbside recycling collections or at drop-off facilities. Recyclable paper was the largest single recyclable component, comprising 7.1% of the total weight of kerbside rubbish.

The diversion rates presented in this section are theoretical maximums, as recovery systems are not capable of diverting 100% of a material from landfill disposal and some recovered materials may be in a condition that makes them unsuitable for diversion.

5.4. Other Waste Disposed of to Land

5.4.1. Farm Waste

In 2013, a study of farm waste management practices in Canterbury region provided data that enables estimates to be made of the quantity of non-natural wastes disposed of on rural properties.[29] A similar study in Waikato and Bay of Plenty regions was carried out in 2014.[30]

The Canterbury study found that 92% of farms use one of the 'three B' methods of waste management - bury, burn, or bulk storage on property. The Canterbury study calculated average annual tonnages of waste for four different types of farm. As farm waste from a specific type of farm is likely to be similar throughout the country, the data is considered to be suitable for application to other regions, by applying the waste data per farm to the numbers of farm types in a region.

Based on the data contained in the 2013 Canterbury study, an estimate of the quantity of non-natural rural waste disposed of in Waikato and Bay of Plenty regions is presented in Table 23. 'Non-natural rural waste' includes materials such as scrap metal, treated timber, fence posts, plastic wraps and ties, crop netting, glass, batteries, and construction and demolition wastes.

Table 23: Estimate of On-Farm Disposal of Non-Natural Waste in Waikato and Bay of Plenty regions

Non-natural rural wastes in Waikato and Bay of Plenty Regions combined	Dairy	Livestock	Arable incl. orchards	TOTAL
Number of farms	6,033	1,173	7,296	**14,502**
Tonnes/farm/annum	6.2	8.3	7.8	**-**
Non-natural waste - tonnes per annum	37,187	9,691	57,055	**103,933**

The 14,502 farms in the two regions[31] are estimated to dispose, on-farm, of an average 7.2 tonnes per farm of non-natural waste per annum. In total, 103,933 tonnes of waste per annum are estimated to be disposed of in this manner across the two regions. This excludes organic and animal wastes.

5.4.2. Tonnage of Waste to Class 2-5 Landfills

Class 2-5 landfills include C&D landfills, managed fills, controlled fills, and cleanfills. Waste disposed of at these sites is not currently subject to the waste levy, but Class 2-4 landfills will be included in the levy payment system by 2023 (see Section 2.2.2.1). Reliable quantitative and qualitative data relating to Class 2-5 landfills are not available, as most facilities do not record tonnage data and, for those that

[29] GHD (2013), *Non-natural rural wastes - Site survey data analysis*, Environment Canterbury Report No.R13/52
[30] GHD (2014) *Rural Waste Surveys Data Analysis Waikato & Bay of Plenty*, Waikato Regional Council Technical Report 2014/55, July 2014
[31] Stats NZ business demography for ANZSIC06 for 2020

do, there is no requirement for the data to be released. At least three published estimates, funded by MfE and other organisations, have been made to quantify waste disposed of at Class 2-5 landfills, but the results vary widely.

In 2007, WRC and BOPRC engaged SKM to develop waste infrastructure reviews in each region.[32] The reviews included estimates of waste to Class 2-5 landfills. The 2013 Stocktake report, prepared by Eunomia Research & Consulting, included an estimate of the quantity of waste materials disposed of at Class 2-5 landfills in each region. In 2014, MfE-funded research into 'non-municipal landfills was conducted by Tonkin & Taylor.[33]

These three published estimates are presented in Table 24.

Table 24: Waste to Class 2-5 Landfills

Waste to Class 2-5 landfills - both regions	Tonnes per annum	Population	Tonnes per capita per annum
2007 Infrastructure reviews	747,000	684,924*	1.15
2013 Stocktake	997,683	671,460 (2013)	1.13
2014 Report	1,829,108	671,460 (2013)	2.72
*Note: * Population calculated from per capita disposal data provided in reports*			

While the estimates from 2007 and 2013 generated similar per capita disposal rates, the per capita disposal rate calculated from the 2014 research was more than twice the rate of the other two. None of the estimates are considered to be sufficiently reliable to be used elsewhere in this report. Reliable data should become available to MfE when the waste levy is expanded to include Class 2-4 landfills in 2022 and 2023, but it is not known as of writing whether this data will be made available to TAs.

5.4.3. Out-of-Region Waste Disposed of to Class 1 landfills

In addition to material originating from within the regions, waste material is also exported to the Waikato Region for disposal at Class 1 landfills. This includes for example waste from Auckland region and Ruapehu District deposited at Hampton Downs landfill, and waste from Gisborne District, which is disposed of at Tirohia. Waste from Auckland region disposed of at Hampton Downs is by far the most significant, with an estimate from Auckland Council's 2017 waste assessment indicating that approximately 600,000 tonnes of waste per year from Auckland is disposed of at Hampton Downs.

[32] SKM (2007) *Waste Infrastructure Review and Strategic Assessment*, prepared for Environment Bay of Plenty and Sinclair Knight Mertz (2007) *Waikato Regional Waste Infrastructure Stocktake and Strategic Assessment*, prepared for Environment Waikato

[33] Tonkin & Taylor (2014), *New Zealand Non-Municipal Landfill Database*, prepared for Ministry for the Environment

5.5. Materials Diverted to Reprocessing or Recycling

This section refers to materials diverted to some form of reprocessing (or recycling), rather than materials diverted to reuse. Generally, diverted materials can be considered to represent successful waste management.

Defining and quantifying diverted materials is more difficult than waste disposed of to landfills. Diverted materials may have a wide range of diversion pathways and a high proportion of some materials are exported for reprocessing (such as plastics and metals).

Data on diverted materials can be classified according to how difficult it is to attain and analyse:

1. The most straightforward, easy-to-collate data on diverted materials relates to kerbside recycling and drop-off points for dry recyclable/commodities such as glass, cans, plastics, and paper and card. For the most part, kerbside recycling collections and drop-off points are controlled by TAs and data on both is reasonably reliable. When kerbside recycling collections are provided privately and transfer stations are privately owned, data is more difficult to obtain, as it may be considered commercially-sensitive or because there is no requirement to provide such information. There is also less data relating to the composition of these diverted material streams, whether TA or privately controlled.
2. Commercial collections of dry recyclables/commodities from commercial properties are more difficult to quantify, as there are multiple service providers and the data is usually considered commercially sensitive and may only be released in response to official requests from TAs. The boundaries of what are defined as 'commercial collections' are not distinct, as business-to-business transactions, such as the reprocessing of plastic manufacturing scrap, can be considered a part of normal business operations and may not be seen as 'recycling'.
3. Commercial recycling of other materials, such as scrap metal and C&D waste such as concrete, is yet more difficult to quantify. The number of service providers is greater than for dry recyclables/commodities, data-gathering methods may not be as reliable, and the boundaries are more difficult to define. In addition, commercial recycling operators may not process materials within a given region, and will act solely as collectors and haulers.
4. Large-scale diversion of industrial by-products, such as timber and pulp processing waste and horticultural waste, is particularly difficult to quantify. 'Diversion' of these wastes can take many forms, from using wood waste as hog fuel to the rendering of meat by-products, making the boundaries difficult to establish. Data on quantities diverted is not always collected in a form that makes analysis and aggregation possible and data is usually considered to be commercially sensitive. On the positive side, large-scale processing is often centred on consented processing sites, and some quantity data on these sites may be available through resource consent conditions.

5.5.1. Diverted Material Quantities

In this section, diverted material quantities from two sources are reported:

- Data provided by TAs; representing TA kerbside collections (both recyclables and organics, where this service is provided), drop-off points, and transfer stations;
- Data provided by diverted material reprocessors.

Neither data set gives a complete view of diverted materials from the two regions.

The data from TAs that is presented in Table 25 does not include material that is diverted through non-council services and the completeness of the data that is presented varies significantly from one TA to another.

Table 25: Diverted Materials, as reported by TAs, 2020

Region	TA kerbside (recyclables)	TA kerbside (organics)	Other diverted materials (from TA transfer stations and drop-off centres)	TOTAL
Waikato	33,115	6,770	23,064	**62,949**
Bay of Plenty	12,154	5,158	17,058	**34,370**
TOTAL	**45,269**	**11,928**	**40,122**	**97,319**

Note: Data for TA kerbside collections was not provided by Ōpōtiki District Council (TA service) and Western Bay of Plenty District Council (private services only at time of survey).

Data for Other diverted materials were reported by only six of the 16 TAs.

The data in Table 26, which was provided by diverted material reprocessors, only represents material that is managed within New Zealand and excludes exported material. This presents a particular gap for some diverted materials, such as plastic and fibre.

Table 26: Diverted Materials Reported by Reprocessors, 2020

Reprocessed material	Waikato (material in tonnes per annum)	Bay of Plenty (material in tonnes per annum)	TOTAL (material in tonnes per annum)
Glass			
Bottles/jars	17,416	14,420	31,836
Plate glass	1,000	1,000	2,000
Organics			
Putrescibles (wet organics)	221,296	95,565	316,861
Greenwaste, wood waste, manure	73,026	187,000	260,026
Rendering	13,000	20,000	33,000
Tyres	7,867	5,242	13,109
Fibre (paper, card)			
Mixed paper	1,200	1,200	2,400
Old corrugated cardboard	30,000	15,000	45,000
Construction & Demolition			
Aggregate	20,000	No processors	20,000
C&D	17,000	No processors	17,000
Scrap metal	61,352	39,227	100,579
Electrical and Electronic	263	190	453
Farm Plastics	143	128	271
Plastics (various grades)	1,849	1,000	2,849
TOTAL	**465,517**	**380,995**	**846,512**
Note: These figures do not include some material exported for reprocessing. The main material streams affected are plastics and fibre (paper/card). The majority of captured metal is represented in these figures.			

5.6. Diverted to Reuse

There is a large and vibrant reuse economy across New Zealand, which is rarely mentioned in a waste context, although it directly contributes to actions higher on the waste hierarchy as it prevents material from going to landfill by providing it a renewed purpose.

The reuse economy includes, for example, all second hand items sold on Trade Me and the second-hand car industry. It also includes all second hand clothes shops, furniture shops, book stores, antique stores, the sale of refurbished electronic goods, and refurbished whiteware.

Due to size of this sector and the scope of this report, it is impossible to quantify the exact volume or tonnage of materials moving through this reuse economy. This section does not attempt to qualify or quantify the entire diversion to reuse sector in Waikato and Bay of Plenty regions, but instead provides examples of some of the many existing reuse initiatives.

5.6.1. Second Hand Market

A Google search was undertaken for 'second hand shops' in Waikato and Bay of Plenty regions. The search predominantly provided listings for second hand clothing, furniture, and book shops, and included 95 stores in Waikato and a further 47 in the Bay of Plenty region. This search included numerous stores run by charities and church organisations including:

- Hospice New Zealand
- Waipuna Hospice
- Habitat for Humanity
- Red Cross
- Salvation Army
- SPCA
- St Vincent de Paul
- St John
- St Barnabas
- St Mary
- St Paul
- St Andrew

There are also a number of non-affiliated second hand stores across both regions, and a handful of shops operating alongside resource recovery sites or transfer stations, such as:

- Kaahu's Nest at Xtreme Zero Waste's site in Raglan, Whāingaroa;
- The Seagull Centre shop, operated by the Seagull Centre Trust and located adjacent to the Thames Refuse Station;
- The Goldmine, in Coromandel Town, operated by the Coromandel Independent Living Trust as a joint venture between Thames Coromandel District Council and Smart Environmental;
- CReW operated by Community Resources Whakatāne and located near the Whakatāne transfer station.

Building material recyclers are also available across both regions, accepting and reselling demolition materials. These include retailers such as:

- Demolition Traders in Hamilton
- Building Recycling Centre in Taupo.

5.6.2. Refillables and Reusable packaging

Another section to the reuse economy, that differs significantly from the second hand shop model, is the refillable and reusable packaging sector. These can be divided into four segments[34]:

- **Refillable by Bulk Dispenser**, whereby customers use their own packaging or the brand's refillable packaging in-store or at a mobile truck;
- **Refillable by Parent Packaging**, whereby refill packaging is made with less material than parent packaging. Parent packaging can be refilled by: pouring product inside parent packaging; placing container inside of parent packaging; or diluting concentrated product in water inside parent packaging;

[34] Source: Patricia Megale Coelho, Blanca Corona, Roland ten Klooster, Ernst Worrell (2020) "Sustainab ility of reusable packaging—Current situation and trends" Resources, Conservation & Recycling: X 6, p.3

- **Returnable Packaging**, whereby customers return empty packaging which will be cleaned and refilled for future use by the retailer/producer;
- **Transit Packaging,** whereby customers either receive the product in reusable packaging which is returned by door delivery/pick up, or customers reuse packaging multiple times before being returned to the producer or disposed of.

All four of these reusable packaging systems see materials reused and waste minimised.

There are two main types of returnable packaging used in Waikato and Bay of Plenty regions - glass milk bottles and beer bottles.

The Waikato region has several farms selling milk in reusable glass bottles:

- Alexander Organics Farm
- Buttercup Dairies
- Dreamview Creamery
- Farmgate Milk
- Jersey Girls Organics

Beer is sold throughout the Waikato and Bay of Plenty regions in Swappa Crates, another example of reusable glass packaging. Associated Bottlers Co (ABC) has operated throughout New Zealand for 100 years and provides a reusable glass beer-bottle-for-hire system to two major breweries. A range of beers are available in Swappa Crates, including Waikato Draught.

Other reusable packaging options available in Waikato and Bay of Plenty regions include Silver Service and Globelet. Silver Service provides reusable plates, bowls, and cutlery for events, as well as a mobile washing and sanitisation facility. Globelet provides reusable cups and bottles to events around New Zealand, and has seven mobile washing stations that can be taken to events for on-site washing, even if the event is not operating Globelet's reuse scheme.

Reusable coffee cup schemes are offered by a number of companies in different locations around New Zealand. Currently, within the Waikato and Bay of Plenty regions there are four cafés using the Again Again and CupCycling schemes: one café in Hamilton, two in Cambridge, and one in Matamata.

A growing number of retailers are providing their produce in bulk bins or bulk containers so that the public can bring (and reuse) their own packaging. This type of shopping has been available through 'bin inn' type retailers for many years, and is now expanding to other retailers.

Other types of reusable packaging used in commercial and industrial settings in the Waikato and Bay of Plenty regions include Chep pallets and IBC containers.

The Rubbish Trip website[35] provides a comprehensive list of retailers in Waikato and Bay of Plenty regions that provide for zero waste shopping.

[35] https://therubbishtrip.co.nz/regional-shopping-guide/regional-zero-waste-shopping-guides/

5.6.3. The Sharing Economy

Another type of diversion to reuse is the reuse facilitated by the sharing economy. The sharing economy describes schemes that share resources over and over again amongst a community. A great example of a sharing economy scheme that we are all well acquainted with are libraries. Other traditional business-based sharing economy schemes include companies that hire out catering equipment or tools (e.g. Hire Pool etc) and vehicle hire companies.

Sharing economy schemes that tend to be community based and operated include toy libraries, tool libraries, sharing or green sheds, community fridges etc.

These initiatives facilitate the sharing of resources and the minimisation of waste, while strengthening community bonds and enabling communities to become more resilient. A number of these initiatives are already operating in the Waikato and Bay of Plenty regions, including 17 toy libraries[36] in Waikato region and eight in Bay of Plenty.

5.7. Projections for Waste and Recovered Materials

A 10-year projection was undertaken to provide an estimate of the quantities of material that may need to be managed in the future. The projections cover waste to Class 1 landfill and diverted materials.

5.7.1. Basis of the Projections

Quantities of waste generated vary over time. For the purposes of this projection, we used population projections to extrapolate residential and kerbside tonnages, construction activity projections to extrapolate C&D tonnages and gross domestic product (GDP) forecasts as the basis for the remaining tonnage projections. The projections assume 'business as usual' in terms of the rates of generation and recovery of materials. Therefore, the proportion of materials recovered and disposed of does not change over time in the projections. The potential impact of Government policy initiatives such as the waste levy, product stewardship, changes to the ETS, infrastructure investment etc. are not factored into the projection. For further detail on the methodology refer to Appendix A.14.0.

5.7.2. Projections

Figure 9 and Figure 10 below show the estimates for the quantities of overall waste to Class 1 landfills and recovered materials (i.e. all material recycled, composted, or reused) produced to 2030 by region. The annual tonnages are provided in Appendix A.14.0.

The 2021/2022 dip is due to Covid 19 disruptions to economic activity.

[36] https://www.toylibrary.co.nz/

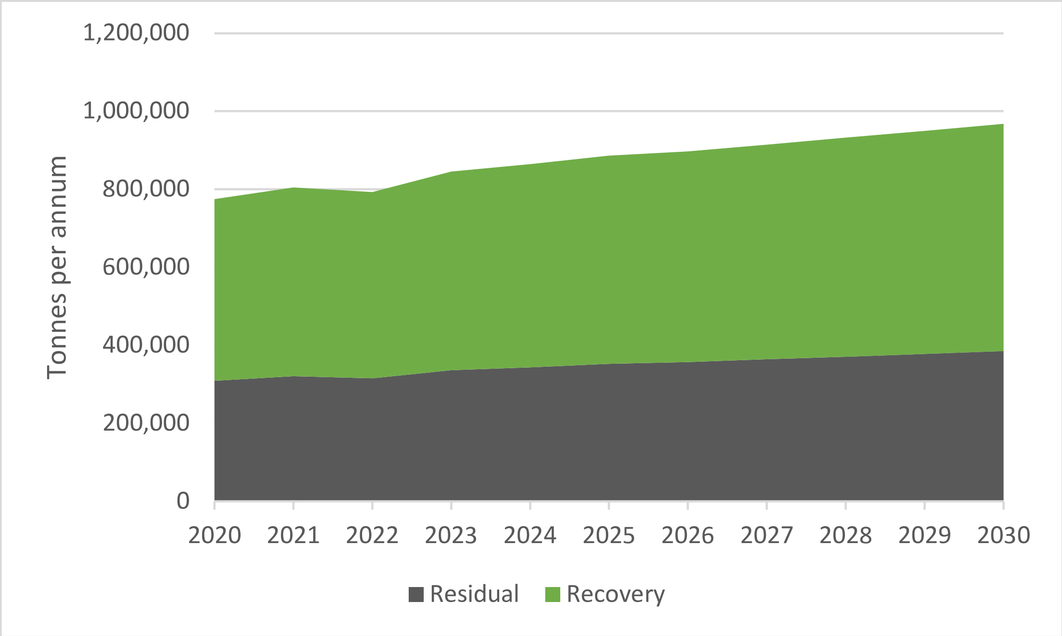

Figure 9: Projected Quantities of Waste and Diverted Materials for Waikato Region

As can be seen from the above chart, the total quantity of materials to be recovered or landfilled will increase if no changes are made. Infrastructure in both instances will need to be aligned with an increase of volumes. In the Waikato region, it is predicted that there would be approximately 385,000 tonnes of waste to be landfilled, and 580,000 tonnes of material to recover by 2030.

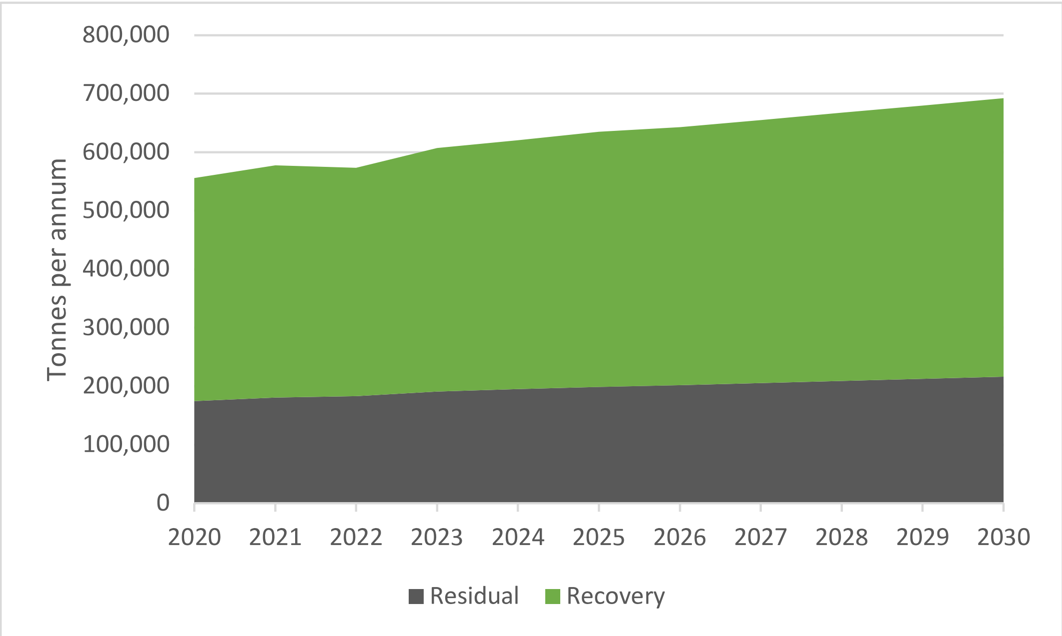

Figure 10: Projected Quantities of Waste and Diverted Materials for Bay of Plenty Region

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If no changes are made, the quantity of waste and diverted materials will increase in the Bay of Plenty. As the Bay of Plenty does not have any landfills, the effect of the increase needs to be considered for the Waikato Region and the infrastructure available. In the Bay of Plenty region, it is predicted that there would be approximately 217,000 tonnes of waste to be landfilled, and 476,000 tonnes of material to recovery by 2030.

Figure 11 shows a breakdown of the composition of overall waste to landfill, over time, for Waikato and Bay of Plenty regions combined.

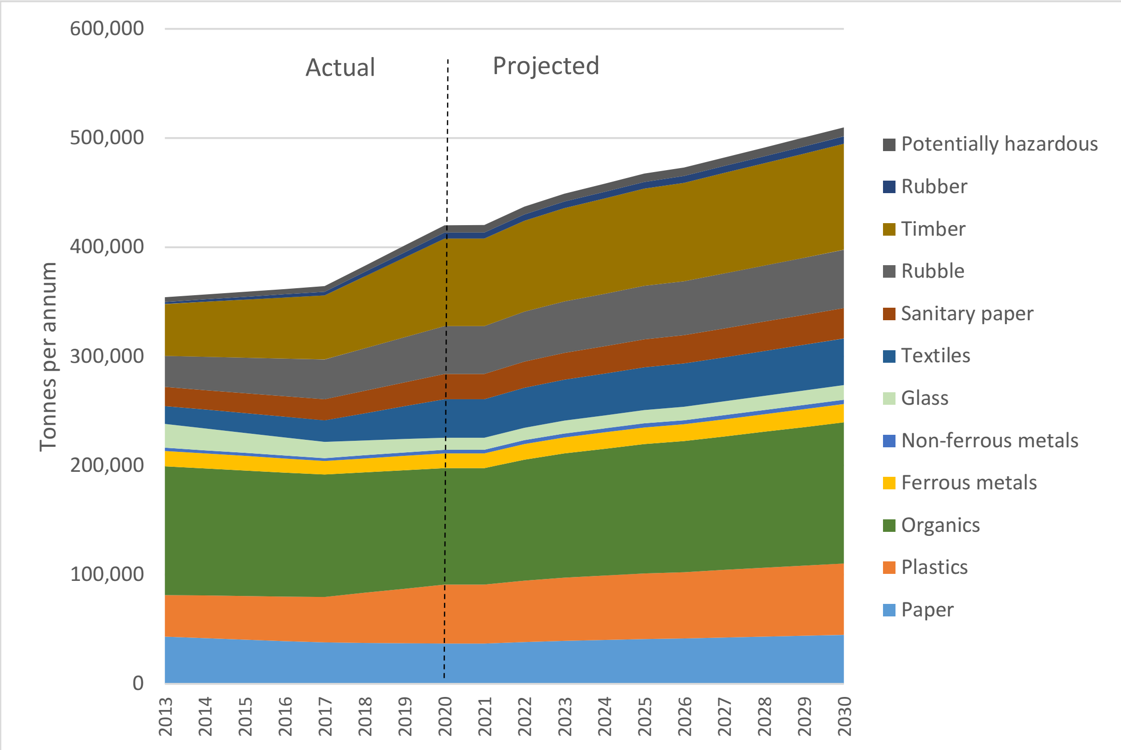

Figure 11: Historical and Projected Quantities of Overall Waste to Landfill to 2030 by Composition, Waikato and Bay of Plenty regions combined[37]

As can be seen from the above chart, annual tonnages across the regions for disposal (excluding special waste) are projected to grow from approximately 420,000 tonnes to over 500,000 tonnes by 2030 if no further action is taken to reduce waste to landfill. The largest waste streams to disposal are organics and timber. There are also significant quantities of plastics, paper and rubble.

[37] Excluding special waste. The availability of historical data on special waste was inconsistent and so did not provide a sufficient basis for including in the projection.

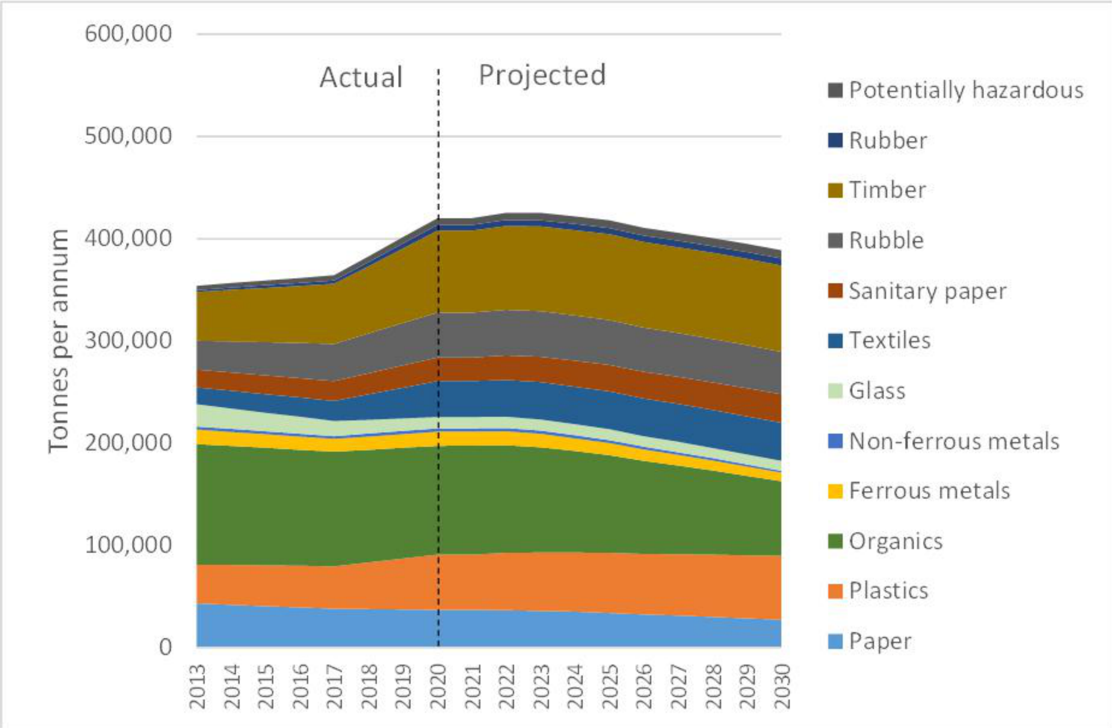

Figure 12 shows how these quantities could change if all materials currently identified as 'divertable' (refer section 5.2.6) are successfully diverted by 2030. The projection assumes that the reduction in these materials takes place evenly over time.

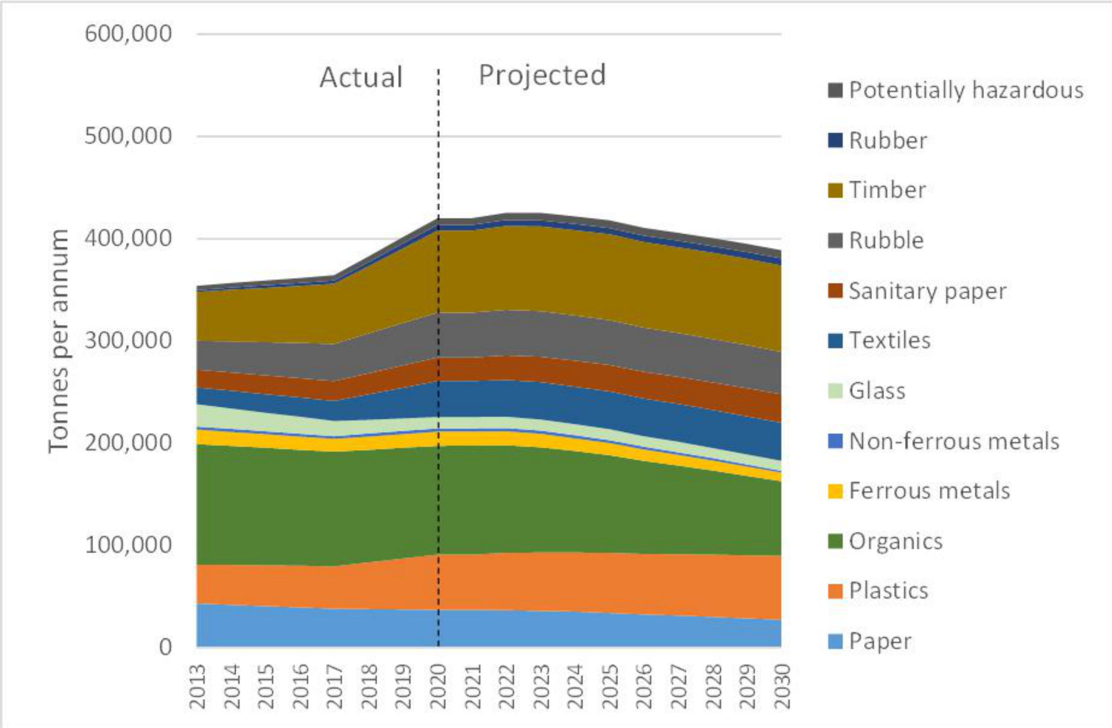

Figure 12: Historical and Projected Quantities of Overall Waste to Landfill with half of 'Divertable' Waste Diverted by 2030[38]

The projection shows that if half of the divertible material is successfully diverted this would reduce the total tonnage to landfill in 2030 from over 500,000 tonnes per annum to under 400,000 tonnes per annum. As above, the majority of this reduction comes from targeting organic waste while paper, metals and glass are also substantially reduced. It worth noting that by diverting half of the 'divertible' materials, landfill quantities are still expected to increase from current levels, but not as significantly.

[38] Excluding special waste. The availability of historical data on special waste was inconsistent and so did not provide a sufficient basis for including in the projection.

6. CARBON EMISSIONS FROM WASTE TO CLASS 1 LANDFILLS

When waste is landfilled, it decomposes anaerobically and methane (CH_4) is produced. Methane is one of the six greenhouse gases (GHG) recognised in the international climate change agreement, the Kyoto Protocol. For GHG accounting purposes, all six greenhouse gases are measured and expressed in terms of carbon dioxide equivalent units, in tonnes (tCO_2-e unit). The Emissions Trading Scheme requires all Class 1 landfills to surrender carbon credits, based on the quantity of waste the landfill receives.

Large Class 1 landfills in New Zealand are required to operate landfill gas capture systems, which reduce the amount of methane gas emitted to the atmosphere. A landfill gas recovery scheme does not, however, capture all the methane gas that a landfill generates, and a proportion is still released. Hampton Downs and Tirohia, the large Class 1 landfills servicing the Waikato and Bay of Plenty regions, both have landfill gas capture systems. The two smaller landfills do not.

The Climate Change (Unique Emissions Factors) Regulations 2009 provides a process through which a Class 1 landfill may apply for a unique emissions factor (UEF), based on the proportion of landfill gas that is captured. Gaining approval for a UEF reduces a Class 1 landfill's liability for surrendering carbon credits.

Approved UEFs are published annually in the New Zealand Gazette. Using the published UEFs for 2020 for Hampton Downs and Tirohia landfills and applying them to the tonnage of waste disposed of at each facility, it is estimated that the landfill gas capture systems reduce the quantity of methane released to the atmosphere by 73%. This means that 27% of all methane generated from landfilled waste is released into the atmosphere.

Landfill methane emissions are calculated based on the composition of waste, with a different emissions factor being applied to each type of material with methane-generating potential. Table 17 lists the materials that could potentially be diverted from Class 1 landfill disposal. Many of these materials are organic in nature, so diverting them from landfill will not only reduce the tonnage of waste to landfill but will change the methane-generating potential of the materials that remain. Table 27 presents:

- the carbon emissions potential of all waste disposed of to Class 1 landfills from Waikato and Bay of Plenty regions, before and after landfill gas is captured;
- the carbon emissions potential from the same waste after all divertable materials have been removed, before and after landfill gas is captured.

As in section 5.2.6, the diversion tonnages used in the calculations are theoretical maximums, as recovery systems are not capable of diverting 100% of a material from landfill disposal. Using real-world recovery rates, which vary from material to material, for the calculations would result in the tonnages of diverted materials being lower.

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Table 27: Carbon Equivalent Emissions from Waste to Class 1 Landfills

	tCO_2-e unit emissions from waste to Class 1 landfills	All waste	Waste after removal of divertable materials	Change
A	Tonnes to Class 1 landfills	483,380	284,216	-41.2%
B	Calculated emissions factor in tCO_2-e per tonne of waste	1.286	1.135	-11.7%
C	Emissions potential, based on calculated emissions factor, in tCO_2-e, before landfill gas capture (= A x B)	621,619	322,684	-48.1%
D	Estimated gas capture rate	73%	73%	-
E	Actual emissions in tCO_2-e, after landfill gas capture (= C x (1 - D))	167,444	86,921	80,523

Note: Due to rounding, performing the calculations given in the equations may not return the exact results shown.

The 483,380 tonnes of waste currently disposed of to Class 1 landfills from Waikato and Bay of Plenty regions has the potential to emit 621,619 tCO_2-e. Landfill gas capture systems reduce this potential to 167,444 tCO_2-e.

Removal of all possible divertable materials (as per Table 17) reduces the tonnage of waste by 41.2% (to 284,216 tonnes) and the emissions factor of the waste by 11.7%. Potential emissions are reduced by 48.1% to 322,684 tonnes CO_2-e. Landfill gas capture systems currently in place in the Class 1 landfills reduce this potential to 86,921 tonnes tCO_2-e.

Table 27 presents the effect on carbon emissions of an 'instantaneous' removal of divertable materials from the existing waste stream to Class 1 landfills.

Figure 13 shows the effect of the removal of all possible divertable materials (as per Table 17) over a ten-year period. Diversion of materials has been applied to the compositions of waste used for the projections. The tCO_2-e shown are after landfill gas capture, calculated to be an average of 73% for the facilities that serve the regions.

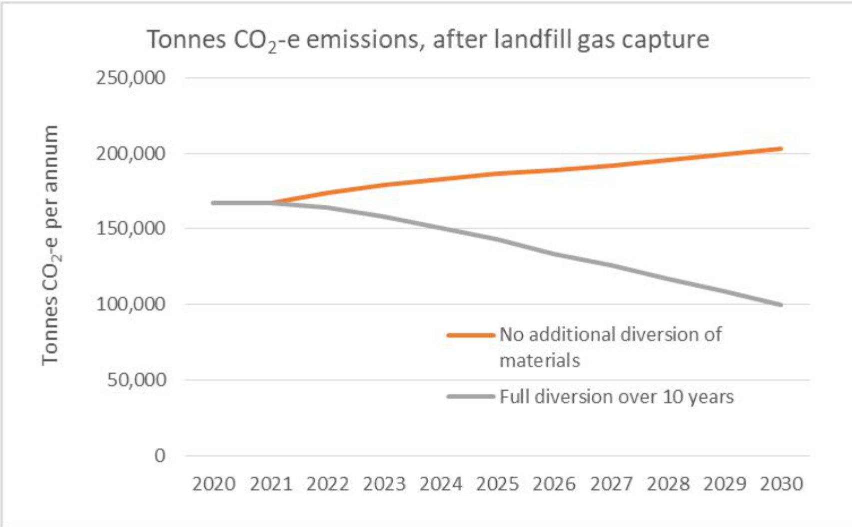

Figure 13: Carbon Emissions to 2030, With and Without Additional Diversion of Materials

7. EVALUATION OF WASTE DATA

This section includes discussion of the types of waste data that are required to monitor and manage waste and to establish policy and strategy directions in the Waikato and Bay of Plenty regions. The analysis assesses how these requirements match up with the data that is currently available, provides an analysis of the gaps, and makes recommendations as to how these gaps may be most effectively addressed.

Improving waste data is an area of concern for both local government and the wider waste industry. For example, improving waste data and information management has previously been an area of focus for Waikato and Bay of Plenty Regional Councils. Both councils have included focus areas to improve waste data and information management in their previous waste strategies.

Waste data was the also subject of the National Waste Data Framework, a national industry-led project carried out in 2015. This focused on the provision of consistent quality data on waste disposed of to Class 1 landfills.

7.1. Uses of Waste Data

This section is primarily concerned with bringing together and analysing information that is important for the setting of policy, the monitoring of targets, and identifying opportunities for waste reduction. It has been assumed that data needs for operational management of waste services is met adequately by the TA's own internal systems and that case-specific data would be collected for designing new services.

There are several purposes for gathering and analysing waste data. These include:

- setting national, regional, or local policy by central government and TAs;
- monitoring and measuring policy effectiveness and the achievement of targets or specific objectives by central government and TAs;
- identifying opportunities for waste reduction by both government and private interests;
- designing and implementing new services and monitoring the adequacy of existing services by both government and private interests; and
- providing information for the ongoing delivery of waste management services by both government and private interests.

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

Supporting data that may inform the influence of the generation of waste, includes:

- a measure of construction activity, such as number of building consents issued;
- a measure of economic activity, such as regional or national GDP;
- population and/or household numbers; or

- participation, set out rates, and other survey information.

7.2. Availability of Data to Territorial Authorities

The data that is available to each TA with reference to waste and diverted materials within their district, is reflected in Table 28. This information is self-reported by the TAs in response to a survey sent out by WasteMINZ in February 2021.

Table 28: Availability of Data to Territorial Authorities, Based on Responses to the WasteMINZ "Waste and Recycling Data Survey", conducted in March 2021

Territorial Authority	Rubbish - kerbside collection		Recycling - kerbside collection			Waste to Class 1 landfill	
	TA	Private	TA	Private	Private commercial premises	TA RTS + direct	Private RTS + direct
Waikato Region							
Hamilton City	Yes	No	Yes	No	No	Yes	No
Hauraki District	Yes	No	Yes	N/A	*No response*	Yes	No
Matamata-Piako District	Yes*	Yes*	Yes*	N/A*	Yes*	Yes*	N/A*
Ōtorohanga District	Yes	N/A	Yes	N/A	*No response*	Yes	No
South Waikato District	Yes	No	Yes	N/A	*No response*	Yes	No
Taupō District	Yes	Yes	Yes	N/A	*No response*	Yes	Yes
Thames-Coromandel District	Yes	*No response*	*No response*	*No response*	*No response*	Yes	*No response*
Waikato District	Yes**	Yes	Yes	No	No	No	No
Waipa District	N/A*	Not known*	Yes*	Not known*	Not known*	N/A*	Yes*
Waitomo District	Yes*	Not known*	Yes*	Not known*	Not known*	Yes*	N/A*
Bay of Plenty Region							
Kawerau District	No	N/A	Yes	N/A	*No response*	Yes	No
Ōpōtiki District	Yes*	Yes*	Yes*	N/A*	Not known*	Yes*	N/A*
Rotorua District	Yes	No	Yes	N/A	*No response*	Yes	No
Tauranga City	Yes***	Yes	N/A	Yes	Yes	No	No

Territorial Authority	Rubbish - kerbside collection		Recycling - kerbside collection			Waste to Class 1 landfill	
	TA	Private	TA	Private	Private commercial premises	TA RTS + direct	Private RTS + direct
Western Bay of Plenty District	N/A	Yes	N/A	Yes	Yes	No	No
Whakatāne District	Yes	No	Yes	No	Yes	Yes	No

*Notes: * Did not participate in 2021 survey, answers from 2017 stocktake are used*
*** Response indicated that quality of data was questionable*
**** The response provided (N/A) to TA rubbish collection was considered inaccurate and therefore changed by authors*

The range of waste data to which TAs have access varies considerably. TAs have been found to have access to data through several sources, including:

- data voluntarily provided by private operators, often for a specific purpose such as the preparation of a waste assessment;
- data extracted from weighbridge records at TA disposal facilities, either by the TA itself or during the course of a SWAP audit. This type of data may be considered to be commercially-sensitive;
- TA contractor tonnage records or extrapolation of data such as rubbish bag sales and average bag weights;
- bylaw provisions for licensed waste collectors and waste facilities; and
- provisions of leases for council-owned land by private waste facilities

As per the TAs' reporting, data availability on disposal and diverted waste streams within their districts is incomplete. All TAs, except Kawerau District, have access to data on TA kerbside collections (both rubbish and recycling). All TAs, except Taupō district, lack any insight into disposal to landfill from private parties.

Even if all the data in Table 28 was available to the TAs, additional information would still be needed for a complete picture of the TA's waste situation. This includes data on diverted material other than TA kerbside collections, and waste to land disposal sites other than landfills (e.g. farm dumps and cleanfills).

7.3. Waste Data Gaps and Barriers

The previous analysis showed that the quality of information, overall, is patchy and the current level of data is likely to be insufficient for properly managing Waikato and Bay of Plenty regions' waste streams into the future. Little has changed in the four years since the last Stocktake to directly address this. If anything, the situation has deteriorated slightly due to increased private sector control over waste flows.

7.3.1. Gaps

The key gaps include the following:

- detailed identification of cleanfills, monofills, and other consented and unconsented land disposal sites;
- composition and tonnage data for cleanfills, monofills, and other consented and unconsented land disposal sites;
- detailed data for private sector recycling, composting, organic processing, and other resource recovery activities;
- access to tonnage and composition information on material disposed of or processed out of the regions;
- the composition of special wastes sent to landfill;
- the types and quantities of special wastes diverted from disposal to land;
- limited information in the public domain on the origin of materials disposed of in the regions' landfills;
- limited information in the public domain about quantities and types of C&D material diverted;
- limited information in the public domain about quantities and composition of C&D material disposed of to landfill, cleanfills, and other land disposal sites.

7.3.2. Barriers

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

- Lack of mandatory data reporting requirements for licensed waste operators;
- Lack of a coordinated central repository for the gathering, analysing, and disseminating of waste data;
- Inconsistent definitions of certain waste streams including, but not limited to, 'C&D waste', 'inorganic' wastes, and 'special' wastes;
- Limited access to data on privately collected waste streams;
- Limited uptake of standardised waste reporting protocols or infrastructure;
- Lack of data on the transportation of diverted materials and residual waste streams outside of the regions for disposal or processing;
- Large number of small operators (particularly in respect of collections) with a relatively high turnover;
- Cleanfilling as a 'permitted activity' in the Waikato region resulting in an amount of cleanfilling activity taking place outside of the regulatory framework and therefore limiting data capture; and
- Absence of reporting requirements in resource consents for cleanfills, monofills, and other land disposal sites.

7.4. Tools for Improving Waste Data

The development of the National Waste Data Framework provides a key tool which can enable TAs to improve data quality and completeness. However, uptake of this tool is still limited, making it too early to comment on its effectiveness.

Under the RMA, waste disposal facilities require resource consent from the regional councils. All major facilities are required to provide information on the quantity of materials accepted. A brief review of consent records in the Waikato and Bay of Plenty regions suggests that for cleanfills this data is not consistently provided.

Requiring consents for all waste disposal facilities in the regions would ideally:

- require regular reporting of waste quantity, including identifying any out of region waste;
- require periodic reporting on waste composition;
- align reporting requirements with those for bylaws (where relevant).

In addition, the Ministry for the Environment could require data to be supplied to the Ministry by making regulations under Section 86 of the WMA. Crucially, regulations made under these provisions could cover any and all types of waste related information, including recovered materials, and from 'any class of person'.

8. OPPORTUNITIES

Analysis of the composition of kerbside rubbish and waste flows to transfer stations and landfills, shows there are considerable quantities of materials going to landfill disposal that could have been recovered through existing services and/or processing options.

The data in Section 5 shows that:

- 41% (199,164 tonnes per annum) of the overall waste stream disposed of to landfill from the regions could have been diverted from landfill disposal. Of this, about 40% is recyclable materials and almost 60% is organic materials. The key recyclable materials are paper/card, ferrous metals, and clean rubble. Kitchen waste makes up 50% of the organic material.
- 59% (80,138 tonnes per annum) of kerbside rubbish could be diverted from landfill disposal. Of this 52% is kitchen waste, 25% is greenwaste, and a further 12% is paper.
- 28% (135,663 tonnes per annum) of waste to Class 1 landfills in the regions is Kerbside rubbish. 30% (146,314 tonnes per annum) is from Industrial/commercial/institutional sources.

This data and the stocktake of services and facilities suggests areas upon which TAs and regional councils could focus to achieve further waste minimisation. These include:

- **Household food waste collections**: The data shows that the majority of kitchen waste going to Class 1 landfills originates from household kerbside rubbish collections. With three large TAs already introducing kerbside food waste collections at the time of this stocktake, there is opportunity for other TAs to leverage this momentum and increased awareness. Acting on reductions in kitchen waste going to landfill also addresses one of the key recommendations of the Climate Change Commission. Household greenwaste is also available for capture and diversion from landfill by TAs or private contractors.

- **Construction and demolition waste**: Improving the management of this waste stream is a national concern. The key issues are reducing, diverting, and managing the sheer quantity of this material, and addressing specific difficult material streams such as treated timber and packaging. While progress is expected at a national level in the medium-long term, TAs could progress local, regional, and cross-regional initiatives in the short term, such as building requirements for construction waste recycling and the use of recovered aggregate into procurement processes. The increase and expansion of the landfill levy should add impetus to these diversion initiatives.

- **Industrial/commercial/institutional waste:** Almost a third of all waste to Class 1 landfills is generated by businesses and institutions. There is potential to work alongside businesses and institutions to encourage further waste minimisation and better diversion of resources from landfill.This has the potential to increase material availability (e.g. nutrients), increase employment, and reduce emissions. TAs can also influence industrial and commercial waste by supporting the development of new markets and infrastructure for material diversion (e.g. composting and recycling infrastructure).

GLOSSARY

Term	Definition
Activity source	Generally, the type of activity that generates the waste being recorded. The Activity sources referenced in this report are: • Domestic Kerbside • Residential • Industrial/commercial/ institutional (ICI) • Landscaping and earthworks • Construction and Demolition (C&D) • Special
Composition	The type of material(s) included in the waste (e.g. wood, paper, greenwaste) or a specific characteristic of the waste (e.g. organic, hazardous). Under the framework composition is expected to be classified according to the Solid Waste Analysis Protocol (SWAP)
Construction and Demolition (C&D)	Waste produced directly or incidentally by the construction and demolition industries. This includes building materials such as insulation, nails, plasterboard and timber, roofing materials, as well as waste originating from site preparation, such as dredging materials, tree stumps, and rubble.
Cross-boundary	When waste is transferred from one Territorial Authority area to another. In the case of a specific authority this could mean waste loads or parts of loads originating in another TA being deposited in a facility located in that TA, or vice versa.
Disposal facility	As defined by Section 7 of the WMA 2008: (a) a facility, including a landfill,- (i) at which waste is disposed of; and (ii) at which the waste disposed of includes household waste; and (iii) that operates, at least in part, as a business to dispose of waste; and (b) any other facility or class of facility at which waste is disposed of that is prescribed as a disposal facility.
Disposal point	A disposal facility or refuse transfer station
Diverted materials	As defined under the WMA 2008: Diverted material means any thing that is no longer required for its original purpose and, but for commercial or other waste minimisation activities, would be disposed of or discarded
Gate fees	The fee charged at a disposal site (landfill, transfer station) when disposing of waste materials (including rubbish, greenwaste, and sometimes recycling). This fee is usually either based on the tonnage or volume of the material being disposed of.
General waste	General waste is a subset of 'Overall waste', and includes all waste transported directly to transfer stations or landfills, with the exclusion of 'Special waste' and 'Kerbside rubbish collections'. General waste can be broken into four 'activity sources' - construction & demolition, industrial/commercial/ institutional, landscaping, and residential waste.
Hazardous waste	Means waste that:

	(a) contains hazardous substances at sufficient concentrations to exceed the minimum degrees of hazard specified by Hazardous Substances (Minimum Degrees of Hazard) Regulations 2000 under the Hazardous Substances and New Organism Act 1996; or (b) meets the definition for infectious substances included in the Land Transport Rule: Dangerous Goods 1999 and NZ Standard 5433: 1999 – Transport of Dangerous Goods on Land; or (c) meets the definition for radioactive material included in the Radiation Protection Act 1965 and Regulations 1982.
Industrial/commercial/ institutional (ICI)	Waste from industrial, commercial and institutional sources (ie supermarkets, shops, schools, hospitals, offices).
Kerbside rubbish	Domestic-type waste collected from residential premises by the local council (or by a contractor on behalf of the council), or by private waste collections (through kerbside or similar collection).
Landscaping	Waste from landscaping activity and garden maintenance (including public gardens), both domestic and commercial, as well as from earthworks activity, unless the waste contains only VENM, or unless the earthworks are for purposes of construction or demolition of a structure.
Litter & illegal dumping	Litter is material that has been disposed of, either intentionally or unintentionally, in a public place, other than in a receptacle or area deemed to be suitable for such disposal by a duly designated agency. Litter is generally distinguished by being of a small enough size that it is plausible that its improper disposal was unintentional. Illegal dumping is the illegal, intentional deposit of any material in any place.
Organic waste	Waste that is of biological origin and that can be degraded through biological processes.
Overall waste	Overall waste refers to all waste that is disposed of at a Class 1 landfill and is subject to the waste levy.
Putrescible waste	Wet organic waste, such as food waste and biosolids.
Refuse transfer station	An appropriately-consented waste management facility for the receipt of rubbish for consolidation prior to transportation to a disposal facilities or another refuse transfer station.
Reprocessor	In this report, reprocessors are recyclers or composters that change the nature of a material. For example, a site that accepts food waste and composts it is a reprocessor, and a transfer station that accepts green waste and then delivers it to another business for composting, is not.
Residential	All waste originating from residential premises, other than that covered by any of the other Activity Source categories. For example, a person arriving with a trailer load after cleaning out the garage would classify as residential waste.
Residual waste	Residual waste is the remaining solid waste once divertable materials such as recyclables and/or compostables, have been removed.
Special waste	Waste that fits into significant, identifiable waste streams, usually from a single generator. Special wastes are those that cause particular management and/or disposal problems and need special care. This includes, but is not restricted, to hazardous and medical wastes (including e-wastes). It also

	includes any substantial waste stream (such as biosolids, infrastructure fill or industrial waste) that significantly affects the overall composition of the waste stream, and may be markedly different from waste streams at other disposal facilities.
SWAP	Solid Waste Analysis Protocol. New Zealand's official protocol for calculating the composition of solid waste. Refer: http://www.mfe.govt.nz/publications/waste/solid-waste-analysisprotocol
Waste	As defined by Section 5 of the WMA 2008, waste (a) means any thing 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
Waste collector	Consistent with section 56 (4) of the WMA 2008. A Waste Collector: (a) includes commercial and non-commercial collectors and transporters of waste (for example community groups and not for profit organisations); but (b) does not include individuals who collect or transport waste for personal reasons (for example a person taking household garden waste to a landfill)
Waste catchment	A waste catchment is a geographical area within which all of the waste that is generated is also disposed of, and within which little or no waste from outside the area is disposed of.

A.1.0 VISIONS, GOALS AND OBJECTIVES FROM TA WMMPS (MAY 2021)

Table 29: Visions, goals and Objectives of TA WMMPs

TA	Vision	Goals	Objectives
Waikato Region			
Hamilton City Council (2018-2024)	Hamilton: where waste minimisation and resource recovery are an integral part of our lifestyle and economy	Reduce quantity of all material entering the waste stream, and increase resource recovery Increase innovation and opportunity from waste resources Hamilton community is a leader in waste minimisation Waste and resource recovery infrastructure meets Hamilton's growing needs Recognise and celebrate innovation in waste minimisation and avoidance	Hamiltonians are choosing to engage in waste minimisation Hamilton's waste diversion is continually increasing All Hamiltonians have access to affordable and resilient waste and resource recovery services Hamilton City Council is a leader by example in minimising waste Hamilton City Council is partnering with others to achieve efficient and effective waste minimisation and management Hamilton City Council is influencing central government's commitment to waste minimisation All Hamilton City Council's regulatory decision-making considers responsible waste and resource recovery
Matamata-Piako District Council (2021)	Zero waste 2038; towards a low-waste, low carbon future	Considering, implementing, and assisting to reduce, reused and recycle wastes Minimise environmental harm and protect public health	Provide sustainable and cost-effective waste minimisation services Waste is a resource Prioritise initiatives aligning with other council objectives Remove/reduce barriers to uptake of services Investigate and implement new services Investigate feasibility of community resource recovery centre Process and manage waste in district

TA	Vision	Goals	Objectives
			Incorporate tikanga and Matauranga Maori Consider environmental impact and public health implications
Ōtorohanga District Council (2018-2024)	"where Kiwis can fly" (overarching district vision)	Safe place to live Services and facilities meet needs Manage natural and physical environment in a sustainable manner Foster, involve and engage community Protect special character of harbours and catchments Recognise importance of rural character	Promote the concept of waste minimisation, and encourage individuals, households, and businesses to take responsibility for their waste, and to provide leadership, information, and support to all groups Actively encourage community participation in all waste reduction activities Target specific components of the waste stream in all sectors of the community and achieve optimum reduction, re-use, and recycling of them Understand our waste stream to enable measurement of changes and the effectiveness of reduction initiatives Progressively extend the range of waste stream components targeted and facilitate their reduction, re-use, or diversion to recycling Ensure that the costs of waste disposal are progressively apportioned to those who generate the waste
South Waikato District Council (2018-2024)	Healthy people thriving in a safe, vibrant, and sustainable community (overarching district vision)	Reduce quantity of material entering the waste stream Increase proportion of material diverted from landfill Increase environmental awareness Ensure safe and efficient collection services for urban communities Provide safe and efficient drop-off facilities for rural communities	Communities choose to actively engage in waste minimisation Waste diversion continually improves Communities have access to kerbside collection services or drop-off facilities for recycling Support waste education programmes in schools Engage with iwi, business, and industry Collaborate with regional councils and/or private waste sector to ensure long term sustainable waste infrastructure Form partnership with recycling processor

TA	Vision	Goals	Objectives
		Waste infrastructure meets the district's changing needs Partnering with recycling processor to ensure efficient and cost-effective materials recovery	
Taupō District Council (2018)	Working together towards a zero waste region (in support of the Waikato Regional Waste and Resource Efficiency Strategy 2015-2018)	Protect public health and safeguard the environment by ensuring waste and diverted material is managed in a safe and sustainable manner that maintains natural and aesthetic values To have the cleanest district in New Zealand	Waste is appropriately disposed of and public health is protected Reduce total quantity of waste to landfill Increase quantity of diverted material through reduction, reuse, recycling, and recovery Use Council influence to advocate waste minimisation by producers and for increased or mandatory product stewardship Support waste minimisation initiatives Utilise appropriate pricing methods to incentivise waste minimisation Change behaviour around litter
Thames-Coromandel and Hauraki District Councils (2017)	Minimise waste to landfill and maximise community benefit	Actively promote waste reduction Increase the recovery and reuse of resources Maintain cost-effective sustainable waste services Minimise harm to the environment and public health	Reduce total quantity of waste to landfill, with emphasis on wastes that cause the most harm Work at local, regional, and national levels with others (including businesses and TAs), to promote waste reduction Prioritise waste reduction, reuse and recovery and recycling initiatives which align with other community objectives such as social and business development, and environmental protection Investigate and develop private and community sector partnerships which contribute positively to the WMMP's vision and goals Work with service providers to identify efficiencies while maintaining or improving service levels

TA	Vision	Goals	Objectives
			Look for opportunities to recover the value of waste materials locally Take actions that will improve information on waste and recovered material activities in the districts, including both Council-contracted and private sector activities to help identify opportunities for improvement Work with the waste sector and the community to increase the range of reuse, recycling and recovery options available in the district, maximising the economic benefit to the community Consider the environmental impact of all options and ensure that the overall environmental impact is considered in decision making Consider the public health impacts of all waste management options and seek to choose options which effectively protect human health and safety
Waikato District Council (2018-2024)	Zero waste and resource recovery are an integral part of our community	Best practice waste minimisation and management, manage social, cultural, spiritual, economic, health and environmental impacts of waste Reduce quantity of material entering the wate stream, increase resource recovery Our nationally recognised, innovate local resource recovery is growing Collaborative partnerships with key stakeholders grow zero-waste communities Access to good information about waste in alignment with the National Waste Data Framework	Waste management practices manage social, cultural, spiritual, economic, health and environmental impacts of waste Waste diversion is increasing and waste to landfill is decreasing including Council's waste generating activities A commitment to work with Tangata Whenua to achieve outcomes Communities are actively engaging in waste avoidance and minimisation, becoming zero-waste communities Partnerships with others to achieve efficient and sustainable waste minimisation and management, including joint working and co-operation with territorial and regional councils, and central government Contributing to the national discussion advocating for effective product stewardship and a bottle deposit scheme

TA	Vision	Goals	Objectives
Waipa District Council (2017-2023)	Building sustainable communities (builds on LTP vision)	Reduce waste and increase resource recovery Collect waste information in line with National Waste Data Framework Connect with community and stakeholders for collaborative and enduring partnerships Progressive and effective waste minimisation and management services and facilities, without unreasonably burdening future ratepayers	Reduce total quantity of waste to landfill Increase resource recovery Increased or mandatory product stewardship and a bottle deposit scheme Ensure access to information on waste from both council and private waste collectors and facilities, in line with the National waste Data Framework Ensure a household refuse and recycling composition analysis is undertaken at least every three years, for both council and private kerbside services Investigate and, where appropriate, develop partnerships, joint working and co-operation with territorial and regional councils, including shared services Develop collaborative and enduring partnerships with community stakeholders to develop community capacity for resource recovery Works with farms and farming organisations to achieve waste reduction Work with local businesses and business organisations to achieve waste reduction at ta local level Investigate and develop resilient access to waste infrastructure and processing facilities within the Waikato region that minimise the impact of external market fluctuations and provide sustainable waste services Establish community led resource recovery facilities (where appropriate)
Waitomo District Council (2018-2028)	Creating a better future with vibrant communities and	Ensure safe disposal of waste to protect our natural environment	Align council's waste management strategies and programmes with national and regional strategic directions

TA	Vision	Goals	Objectives
	thriving business (LTP 2018-2028)	To minimise waste disposal within the district	Ensure (as far as is practicable) that waste generators meet the cost of waste they produce Meet the requirements of all relevant legislation including LGA, WMA Provide a practical guide to waste management in the Waitomo District Promote cost effective, efficient, and equitable waste management services to the community Minimise the quantity of waste being generated and disposed of to promote the sustainable use of natural and physical resources Encourage/support principles of cleaner production and waste hierarchy Follow council's LTP and district plan Reduce waste generated in the District requiring disposal, having regard to the NZ waste strategy and the Waikato RC policy statement Identify and pursue opportunities for local business and communities to implement their waste reduction and resource recovery initiatives and help secure the economic advantages of the District's green image Lead by example to assess the potential for waste reduction through integrated waste management principles Take pride in its achievements in waste minimisation through voluntary initiatives as well as promoting economic efficiency and sustainable management of the environment
Bay of Plenty Region			
Kawerau District Council (2012)	Working towards zero waste	Reduce the volume of waste going to landfill, primarily by increasing the amount of material diverted into the recycling and green waste collections.	Increase information provision and community education Encourage businesses to recycle more of their waste

TA	Vision	Goals	Objectives
			Keep abreast of new developments and investigate the use of new technology which may reduce the volume of waste from the district going to landfill
Ōpōtiki District Council (2018)	Towards Zero Waste	A community which is committed to reducing reusing and recycling products and materials A community which is committed to the minimisation of waste sent to landfill for disposal A community that is committed to reducing the risk of environmental damage resulting from waste management methods A community that considers, and where appropriate implements, new initiatives, and innovative ways to assist in reducing, reusing and recycling wastes A community where litter in the town centre is managed and illegal dumping activities are addressed	Promote, encourage, and emphasise reduction, reuse and recycling Reduce the amount of waste sent for disposal to landfill Operate the council's RRCs in a manner that encourages the community to reuse and recycle materials while accepting residual waste for disposal to landfill Encourage local businesses to minimise their waste Provide educational information about waste reduction, reuse and recycling of products and materials and provision of waste services Consider and seek to choose waste management options with the least overall harm to public health and the environment Work with the community to evaluate and where appropriate develop new initiatives and innovative ways to address waste management Provide litter collection services in the town Centre and clean-up of illegal dumping sites, including removal of abandoned vehicles, in the District.
Rotorua District Council (2016-2022)	To empower and enable Rotorua residents, so that they may be able to comprehensively minimise waste,	Industry leading Health and Safety standards Significantly improve the District's environmental footprint A public litter bin management system that promotes and encourages recycling	Enhance waste collections health and safety performance Enhance landfill health and safety performance Engage and educate residents and facilitate increased diversion of recyclables Optimise diversion of recyclables and achieve reducing trends of waste sent to the landfill

TA	Vision	Goals	Objectives
	recycle all practically possibly materials and to recover value from the waste stream	Improve the Atiamuri landfill	Reduce organic waste to landfill Increase customer satisfaction rating for rubbish and recycling collection services in Councils' annual community survey Optimise litter bins network Promote passive waste minimisation education through standardisation and the deployment of the national waste colour framework Minimise health and safety risks and impact on the environment Establish a sustainable long-term option for the landfill
Tauranga City Council (2016-2022) and Western Bay of Plenty (2017)	Minimising waste to landfill	Reduce and recover more waste Apply the latest proven and cost-effective waste management and minimisation approaches Collect information to enable informed decision making Create benefit for our community	Reduce the total quantity of waste to landfill, with an emphasis on wastes that create the most harm Increase diversion of waste that is currently disposed of to landfill for reuse, recovery, or recycling Investigate and where appropriate develop partnership, joint working and co-operation across the private and community sectors as well as territorial and regional councils, including shared services Investigate the use of available recovery and treatment technologies and service methodologies and apply these where appropriate Engage the community and provide information, education, and resources to support community actions Use Council influence to advocate for increased or mandatory producer responsibility Work with local businesses and organisations to achieve waste reduction at a local level

TA	Vision	Goals	Objectives
			Take actions that will improve information on waste and recovered material activities in the districts, including both Council-contracted and private sector activities Work towards aligned data collection and reporting systems across the districts, region and nationally Work with service providers to identify efficiencies while maintaining and/or improving service levels Consider both short- and long-term cost impacts of all actions across the community including economic costs and benefits Consider the environmental impact of all options and ensure that the overall environmental impact is considered in decision making
Whakatāne District Council (2021-draft)	Our communities working together to turn our waste into resources	Communities throughout our district are knowledgeable about waste Communities that are committed to firstly avoiding waste, then secondly reusing and recycling it Communities that look for and consider new initiatives and innovative ways to minimise waste	Provide education on what happens to different types of waste and the resulting implications (financial, health and environmental) Make waste data easily accessible and understood Provide information that allows our communities to make best use of existing waste avoidance and diversion services, and potential new ones Process and manage waste locally where feasible and cost effective Create opportunities for our communities to be involved with waste minimisation initiatives Where avoidance of waste is not possible, look for opportunities to turn it into a resource Investigate and implement new services, facilities, or other initiatives that will avoid waste or divert it from landfill

TA	Vision	Goals	Objectives
			Consider each waste stream separately when investigating new minimisation opportunities Work collaboratively with other councils, whanau, hāpu and iwi and relevant stakeholders to provide new waste minimisation opportunities and lobby central government for change

A.2.0 SUMMARY OF WMMPS ACTIONS

Table 30: Summary of WMMP Actions

Summary of Actions from TA WMMPs, Ranked from High to Low (By Count of WMMPs)	**Waikato Region**									**Bay of Plenty Region**					
	Matamata-Piako	Hauraki & Thames-Coromandel	Hamilton	Otorohanga	South Waikato	Taupō	Waikato	Waipa	Waitomo	Kawerau	Opotiki	Rotorua	Tauranga	Western BOP	Whakatāne
Collaboration (regional, community, industry, iwi) (16)															
Communication, education, promotion (16)															
Recycling kerbside, optimize, review (15)															
Product stewardship (14)				+CRS									+CRS	+CRS	+CRS
Monitor and report - data (14)															
Bylaw review/actions 12)															
Drop-off and RTS actions (12)															
Food waste actions (12)															

Summary of Actions from TA WMMPs, Ranked from High to Low (By Count of WMMPs)	**Waikato Region**									**Bay of Plenty Region**					
	Matamata-Piako	Hauraki & Thames-Coromandel	Hamilton	Otorohanga	South Waikato	Taupō	Waikato	Waipa	Waitomo	Kawerau	Opotiki	Rotorua	Tauranga	Western BOP	Whakatāne
Litter/illegal dumping (10)															
Event waste (10)															
National Waste Data Framework (10)															
Waste Operator Licensing (9)															
Grants/Funding (9)															
Organic waste (8)															
Liquid and hazardous wastes (7)															
Health & Safety (7)															
Resource Recovery Centre/ Transfer station (7)															
C&D waste (7)															
E-waste (6)															

Summary of Actions from TA WMMPs, Ranked from High to Low (By Count of WMMPs)	**Waikato Region**									**Bay of Plenty Region**					
	Matamata-Piako	Hauraki & Thames-Coromandel	Hamilton	Otorohanga	South Waikato	Taupō	Waikato	Waipa	Waitomo	Kawerau	Opotiki	Rotorua	Tauranga	Western BOP	Whakatāne
Business waste (incl. medical) (6)															
Reuse (4)															
Farm waste (4)															
New Builds/MUDs (3)															
Procurement (3)															
Biosolids (2)															
Reporting against targets (3)															
Polystyrene (1)															
Peak season (tourism) (1)															
Waste policies by central govt (1)															

Legend: Proportion of WMMP's in which action was mentioned, from most (darkest and top) to least (lightest and bottom)

= More than 75% = Between 50% and 75% = Between 25% and 50% = Less than 25%

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A.3.0 RTS, RECYCLING CENTRES AND DROP-OFFS

Table 31: RTS, Recycling Centres and Drop-off sites, Waikato and Bay of Plenty Regions

TA	Location	Residual waste	Dry recyclables	Green waste	Timber	Cleanfill / concrete	Hazardous	Scrap metal	Car bodies	Tyres
Waikato Region										
Up to date information on facilities and materials is available at https://www.waikatoregion.govt.nz/services/regional-services/waste-hazardous-substances-and-contaminated-sites/waste-services-by-type-council										
Bay of Plenty Region										
Kawerau District	Kawerau RTS	✓	✓	✓	✓	✓	✓			✓
Ōpōtiki District	Ōpōtiki RTS	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Te Kaha RTS	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Waihau Bay RTS	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rotorua District	Okere RTS	✓	✓					✓		
	Reporoa RTS	✓	✓					✓		
	Tarawera RTS	✓	✓					✓		
	Mamaku RTS	✓	✓					✓		
	In-town RC		✓							
Tauranga City	Te Maunga RTS	✓	✓	✓		✓	✓	✓		✓

TA	Location	Residual waste	Dry recyclables	Green waste	Timber	Cleanfill / concrete	Hazardous	Scrap metal	Car bodies	Tyres
	Maleme Street RTS (to close to public from August 2021)	✓	✓	✓		✓	✓	✓		✓
Western BOP District	Te Puke RC		✓	✓			✓			
	Omokoroa Greenwaste						✓			
	Katikati RC		✓	✓			✓			
	BP Pongakawa		✓							
	Athrenree RC		✓	✓			✓			
Whakatāne District	Whakatāne RC	✓	✓	✓		✓	✓			✓
	Murupara RTS	✓	✓	✓		✓	✓			✓
	Minginui RTS	✓	✓	✓		✓	✓			✓
	Ruatahuna RTS	✓	✓	✓		✓	✓			✓

A.4.0 KERBSIDE RECYCLABLE MATERIALS COLLECTED IN TA COLLECTIONS

Table 32: Kerbside Recyclable Materials Collections in TA Collections

District	Frequency	Container	Paper	Card	Plastic 1-2	Plastic 5	Plastic 3,4, 6,7	Glass	Tin	Alumi nium	Glass in separa te bin	Plastic Bags
Waikato Region												
Hamilton City Council	Fortnightly	240 L Bin and crate	■	■	■	■	■	■	■	■	■	
Hauraki District Council	Fortnightly	240 L Bin and crate	■	■	■			■	■	■	■	
Matamata-Piako District Council	Fortnightly	240 L Bin and crate	■	■	■			■	■	■	■	
Ōtorohanga District Council	Weekly	Crate	■	■	■			■	■	■		
South Waikato District Council	Fortnightly	Crate	■	■	■			■	■	■		
Taupō District Council	Weekly	Crate	■	■	■	■		■	■	■		
Thames Coromandel District Council	Fortnightly	240 L Bin and crate	■	■	■			■	■	■	■	
Waikato District Council	Weekly	Crate, paper bundled	■	■	■			■	■	■		
Waipa District Council	Fortnightly/ monthly	Crate, paper bundled	■	■	■			■	■	■	■	

District	Frequency	Container	Paper	Card	Plastic 1-2	Plastic 5	Plastic 3,4, 6,7	Glass	Tin	Alumi nium	Glass in separa te bin	Plastic Bags
Waitomo District Council	Weekly	Crate, paper bundled										
Bay of Plenty Region												
Tauranga City Council (from July 2021)	Fortnightly	240 L Bin and crate										
Whakatāne District Council	Fortnightly	240 L Bin and crate										
Western Bay of Plenty District Council (from July 2021)	Fortnightly	240 L Bin and crate										
Rotorua District Council	Fortnightly	240 L Bin and crate										
Kawerau District Council	Weekly	Crate, paper bundled										
Ōpōtiki District Council	Weekly	Crate										
Total			**16**	**16**	**16**	**5**	**3**	**16**	**16**	**16**	**9**	**2**

A.5.0 KERBSIDE RUBBISH COLLECTIONS AND CHARGES

Table 33: Kerbside Rubbish Collections and Charges, Waikato and Bay of Plenty Regions

District	Provider	Container	Charge/Funding	Frequency
Waikato Region				
Hamilton City Council	Council contracted	120-L wheelie bin	Rates funded	Fortnightly
Hauraki District Council	Council contracted	60L Council bag	$3.00	Weekly
Matamata-Piako District Council	Council contracted	60L Council bag	$3.00	Weekly
Ōtorohanga District Council	Council contracted	Council Bag	Fee per bag	Weekly
South Waikato District Council	Council contracted	Council bag 120-L wheelie bin from Sept 2021	$2.15	Weekly
Taupō District Council	Council contracted	HH bag + sticker	$1.50	Weekly
Thames Coromandel District Council	Council contracted	60L Council Bag 30L Council Bag	$3.90 $1.50	Weekly, more in peak season
Waikato District Council	Council contracted	Householder bag 120-L wheelie bin in Tuakau	$115.94 per annum $1.50 per bag in some areas $3.00 per wheelie bin PAYT tag	Weekly
Waipa District Council	Private sector			
Waitomo District Council	Council contracted	Council Bag	$3.40	Weekly
Bay of Plenty Region				
Kawerau District Council	Council contracted	60L bin 120L bin	$178.50 UAF for 60L bin $238.50 for 120L bin	Weekly

District	Provider	Container	Charge/Funding	Frequency
Ōpōtiki District Council	Council contracted	45-L wheelie bin	Targeted rate	Weekly
Rotorua District Council	Council contracted	140L bin	Targeted and general rates funded	Weekly
Tauranga City Council	Council contracted	140-L wheelie bin (from July 2021)	Targeted rate of $230 for first year	Weekly
Western Bay of Plenty District Council	Council contracted	140L wheelie bin (from July 2021)	$3.95 per wheelie bin PAYT tag	Weekly
Whakatāne District Council	Council contracted	80 L bin	Uniform annual charge	Weekly

A.6.0 TA CONTRACTS FOR RUBBISH AND DIVERTED MATERIAL SERVICES

Table 34: TA Contracts for Rubbish and Diverted Material Services

TA	Service	Contractor	Expiry Date
Waikato Region			
Hamilton City	Kerbside recycling and rubbish collections	EnviroWaste Services Ltd	2030
	Lincoln Rd RTS	EnviroWaste Services Ltd	2030
	Hamilton Organic Centre	EnviroWaste Services Ltd	2030
Hauraki, Matamata-Piako, Thames-Coromandel District Councils	Kerbside rubbish and recycling collections	Smart Environmental Ltd	2023
	Recyclables transfer	Smart Environmental Ltd	2023
	Rubbish transfer	Smart Environmental Ltd	2023
	Rubbish disposal	Waste Management NZ Ltd	Unknown
Ōtorohanga District	Kerbside recycling and rubbish collections	EnviroWaste Services Ltd	Unknown
	Ōtorohanga and Kawhia RTS operation	EnviroWaste Services Ltd	Unknown
	Ngutunui RC operation	Ngutunui School	Unknown
South Waikato District	Kerbside recycling and rubbish collection	EnviroWaste Services Ltd	2030
	Recyclables processing	South Waikato Achievement Trust	2030
	Rubbish transfer station and landfill disposal	EnviroWaste Services Ltd	2030
Taupō District	Kerbside recycling and rubbish collections	EnviroWaste Services Ltd	July 2023
	Recycling processing	EnviroWaste Services Ltd	Unknown
Waikato District	Tuakau kerbside rubbish and recycling collection	Smart Environmental	Currently being negotiated
	Raglan kerbside rubbish and recycling collection	Xtreme Zero Waste	Unknown

	Kerbside rubbish and recycling collection, all other areas	Metrowaste Waikato	Unknown
	Inorganic collections (ex Raglan)	Metrowaste Waikato	Annual
	Operation of RTS - Huntly and Te Kauwhata	Metrowaste Waikato	Unknown
	Operation of RTS - Raglan	Xtreme Zero Waste	Unknown
	Waste transfer and disposal, hazardous waste (other than Raglan)	Metrowaste Waikato	Unknown
	Raglan - waste transfer and disposal, hazardous waste	Xtreme Zero Waste	Unknown
	Drop-off facilities	Xtreme Zero Waste	Unknown
Waipa District	Kerbside recycling collection	Smart Environmental Ltd	2026
Waitomo District	Kerbside rubbish and recycling collection	EnviroWaste Services Ltd	2024
	Waitomo District Landfill Operation and Maintenance Contract	EnviroWaste Services Ltd	2024
Bay of Plenty Region			
Kawerau District	Kerbside rubbish and recycling collection	Waste Management NZ Ltd	2023
	Greenwaste collection	Council	Unknown
	RTS operation - Kawerau	Council	Unknown
	Waste transfer	Hubbard Contracting	Unknown
Ōpōtiki District	Kerbside rubbish and recycling collection	Council	Unknown
	RTS operation	Council	Unknown
Rotorua District	Kerbside rubbish and recycling collection	Smart Environmental Ltd	2031
	RTS operation	Smart Environmental Ltd	2031
Tauranga City	Kerbside rubbish and recycling collection	EnviroWaste Services Ltd (as of July 2021)	2029
	RTS operation	EnviroWaste Services Ltd	Unknown
Western Bay of Plenty District	Kerbside rubbish and recycling collection	EnviroWaste Services Ltd (as of July 2021)	2029

Whakatāne District	Kerbside rubbish and recycling collection, greenwaste collection, RTS operation - Whakatāne	Waste Management NZ Ltd	2023
	RTS operation - Murupara	Merrimans Ltd	Roll over contract
	Waste Transfer	Priority Logistics	2023
	Disposal	Waste Management NZ Ltd	2023

A.7.0 TA QUESTIONNAIRE

Table 35: Questionnaire sent to Waikato and Bay of Plenty TAs

District - 2021	
Council-controlled waste streams	
KERBSIDE COLLECTION: General refuse	
Residential kerbside refuse	
Is there a council kerbside refuse collection from residential properties?	
What properties receive the service?	
What percentage of what number of properties are eligible for the service?	
What is the refuse receptacle and size?	
What is the frequency of collection?	
How is the collection funded?	
Who is the service provider?	
Where is the kerbside refuse disposed of?	
Commercial kerbside refuse	
Is there a council kerbside refuse collection from commercial properties?	
What properties receive the service?	
What is the refuse receptacle and size?	
What is the frequency of collection?	
How is the collection funded?	
Who is the service provider?	
KERBSIDE COLLECTION: Recyclables	
Is there a council kerbside collection of recyclables?	
What properties receive the service?	
What is the recycling receptacle and size?	
What is the frequency of collection?	
How is the collection funded?	
Who is the collection service provider?	
What recyclable materials are accepted?	
Where are the recyclables processed, and by what organisation?	
KERBSIDE COLLECTION: Organic waste	
Is there a council kerbside collection of organic waste?	

District - 2021	
KERBSIDE COLLECTION: Inorganic refuse	
Is there a council kerbside collection of inorganic refuse?	
What properties receive the service?	
What is the frequency of collection?	
Who is the service provider?	
Where is the inorganic refuse disposed of?	
OTHER WASTE STREAMS	
Public place litter bins - Who is the service provider?	
Loose litter - Who is the service provider?	
Illegal dumping - Who is the service provider?	
Abandoned car recovery - Who is the service provider?	
Sewage sludge/ Biosolids - Where are biosolids from wastewater treatment plants disposed of?	
How many tonnes of biosolids are disposed of each year?	
Milliscreenings - Where are sewage and/or water treatment plant milliscreenings disposed of?	
How many tonnes of milliscreenings are disposed of each year?	
Road sweepings - Where are road sweepings disposed of?	
How many tonnes of road sweepings are disposed of each year?	
TRANSFER STATIONS	
What transfer stations does council own and where is the waste from each disposed of?	
What organisation operates council's transfer station(s)?	
RECYCLING CENTRES AND DROP-OFF FACILITIES	
Name(s) of recycling centres and drop-off facilities owned by council	
CLASS 1 LANDFILLS	
Name(s) of class 1 landfills owned by council	
CLASS 2-4 LANDFILLS (OTHER LAND DISPOSAL SITES)	
Name(s) of class 2-4 landfills (cleanfills etc.) owned by council	
MATERIAL RECOVERY FACILITIES (for recyclables)	
Description of MRF(s) owned by council	
MATERIAL RECOVERY FACILITIES (other than for recyclables)	
Description of other recovery facilities (e.g. composting plants, C&D recovery) owned by council	
Privately-controlled waste streams	

District - 2021	
REFUSE AND RECYLING OPERATORS	
Kerbside domestic/ commercial refuse - What companies collect kerbside refuse from residential and/or commercial properties, independent of council contracts?	
Kerbside recycling collections - What companies collect kerbside recycling from residential and/or commercial properties, independent of council contracts?	
Organic collections - What companies collect greenwaste and/or other organic waste from residential and/or commercial properties, independent of council contracts?	
Industrial/ commercial/ institutional refuse - What companies collect waste from industrial, commercial, and institutional customers?	
Industrial/ commercial/ institutional recycling - What companies collect recycling from industrial, commercial, and institutional customers?	
LARGE-SCALE WASTE GENERATORS	
What companies generate significant quantities of waste (e.g. meat processors, saw mills, food processors) and where is that waste disposed of (e.g. landfill, class 2-4 landfill)?	
TRANSFER STATIONS	
What transfer stations are privately owned and where is the waste from each disposed of?	
RECYCLING CENTRES AND DROP-OFF FACILITIES	
Name(s) of recycling centres and drop-off facilities that are privately-owned	
CLASS 1 LANDFILLS	
What class 1 landfills in the city/district are privately owned?	
CLASS 2-4 LANDFILLS (OTHER DISPOSAL FACILITIES)	
What class 2 or 3 landfills in the city/district are privately owned?	
What class 4 landfills in the city/district are privately owned?	
MATERIAL RECOVERY FACILITIES (for recyclables)	
Description of MRF(s) owned privately	
MATERIAL RECOVERY FACILITIES (other than for recyclables)	
Description of other recovery facilities (e.g. composting plants, C&D recovery) that are privately-owned	
Annual Average Tonnage Data	
Council's kerbside refuse collection (from both residential and commercial properties)?	
Council's kerbside organic collection (from both residential and commercial properties)?	
Council's kerbside inorganic collection (from both residential and commercial properties)?	

District - 2021	
Council's kerbside recycling collection (from both residential and commercial properties)?	
Private operators' kerbside refuse collections (from both residential and commercial properties)?	
Private operators' organic collections (from both residential and commercial properties)?	
Private operators' inorganic collection from residential properties?	
Recycling collected by private operators from all commercial properties?	
Waste disposed of to Class 1 landfills from council-owned transfer stations in the city/district?	
Waste disposed of to Class 1 landfills from privately-owned transfer stations in the city/district?	
Waste from the city/district disposed of directly to Class 1 landfills? (i.e. does not pass through a transfer station)	
Waste disposed of at each of the Class 1 landfills in the city/district? (separate tonnage figures for each landfill)	
Waste disposed of at each of the Class 1 landfills in the city/district that does not originate from within the city/district?	
Material disposed of at each of the Class 2-4 landfills in the city/district?	
Diverted material in the city/district, not including kerbside collections described above? (from transfer stations, drop-off centres, etc)	
Material processed at each of the MRFs in the city/district?	

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A.8.0 ACTIVITY SOURCE OF WASTE TO CLASS 1 LANDFILLS – 2017 AND 2020

Table 36: Activity Sources of Waste to Class 1 Landfills – 2017 and 2020

Activity sources of waste to Class 1 landfills – Waikato and Bay of Plenty regions combined – 2017 and 2020	Tonnes per annum (% of total)			
	2017		2020	
Construction & demolition	71,584	20%	83,538	17%
Industrial/commercial/institutional	128,588	35%	146,314	30%
Landscaping	18,560	5%	21,772	5%
Residential	25,983	7%	32,889	7%
Subtotal - General waste	**244,716**	**67%**	**284,513**	**59%**
Kerbside rubbish	116,963	32%	135,663	28%
Special waste	2,584	1%	63,204	13%
TOTAL	**364,264**	**100%**	**483,380**	**100%**

A.9.0 COMPOSTION OF WASTE TO CLASS 1 LANDFILLS BY ACTIVITY SOURCE

Table 37: Composition of Waste to Class 1 Landfills by Activity Source, in tonnes, 2020

Composition of waste to Class 1 landfills - by activity source - from both regions - tonnes per annum - 2020		C&D	Industrial/ commercial/ institutional	Landscaping	Residential
Paper	Recyclable	324	4,460	46	1,114
	Cardboard	2,038	9,032	118	2,095
	Non-recyclable	427	4,125	27	203
	Subtotal	**2,790**	**17,617**	**191**	**3,413**
Plastics	Recyclable	204	1,189	21	171
	Non-recyclable	3,711	29,441	397	3,290
	Subtotal	**3,915**	**30,630**	**418**	**3,461**
Organics	Kitchen waste	122	13,277	167	2,062
	Compostable greenwaste	777	3,162	11,495	2,419
	Non-compostable green.	75	1,146	3,191	312
	Organics other	11	2,382	56	135
	Subtotal	**985**	**19,966**	**14,908**	**4,927**
Ferrous	Primarily ferrous	1,669	2,006	26	599
	Steel other	1,132	3,748	99	1,735
	Subtotal	**2,801**	**5,754**	**124**	**2,334**
Non-ferrous	**Subtotal**	**249**	**1,387**	**13**	**207**
Glass	Recyclable	220	1,764	19	349
	Glass other	894	2,311	20	434
	Subtotal	**1,114**	**4,074**	**40**	**783**
Textiles	Clothing/textiles	198	4,311	17	1,056
	Other textiles	4,518	14,271	180	5,168
	Subtotal	**4,717**	**18,582**	**197**	**6,224**
Sanitary paper	**Subtotal**	**27**	**7,217**	**50**	**578**
Rubble	Cleanfill	5,856	1,481	4,304	336
	New plasterboard	7,262	265	0	130
	Other	10,298	7,571	173	764
	Subtotal	**23,416**	**9,317**	**4,478**	**1,230**
Timber	Reusable	5,453	1,153	138	531
	Unpainted & untreated	6,413	6,373	16	619
	Non-recoverable	30,941	16,477	1,056	8,114
	Subtotal	**42,806**	**24,003**	**1,210**	**9,264**
Rubber	**Subtotal**	**582**	**3,859**	**136**	**321**
Potentially hazardous	**Subtotal**	**137**	**3,907**	**8**	**146**
TOTAL		**83,538**	**146,314**	**21,772**	**32,889**

Note: Due to rounding, some totals may not correspond with the sum of the separate figures.

Table 38: Composition of Waste to Class 1 Landfills by Activity Source, in percentages, 2020

Composition of waste to Class 1 landfills - by activity source - from both regions –2020		C&D	Industrial/ commercial/ institutional	Landscaping	Residential
Paper	Recyclable	0.4%	3.0%	0.2%	3.4%
	Cardboard	2.4%	6.2%	0.5%	6.4%
	Non-recyclable	0.5%	2.8%	0.1%	0.6%
	Subtotal	**3.3%**	**12.0%**	**0.9%**	**10.4%**
Plastics	Recyclable	0.2%	0.8%	0.1%	0.5%
	Non-recyclable	4.4%	20.1%	1.8%	10.0%
	Subtotal	**4.7%**	**20.9%**	**1.9%**	**10.5%**
Organics	Kitchen waste	0.1%	9.1%	0.8%	6.3%
	Compostable greenwaste	0.9%	2.2%	52.8%	7.4%
	Non-compostable green.	0.1%	0.8%	14.7%	0.9%
	Organics other	0.0%	1.6%	0.3%	0.4%
	Subtotal	**1.2%**	**13.6%**	**68.5%**	**15.0%**
Ferrous	Primarily ferrous	2.0%	1.4%	0.1%	1.8%
	Steel other	1.4%	2.6%	0.5%	5.3%
	Subtotal	**3.4%**	**3.9%**	**0.6%**	**7.1%**
Non-ferrous	**Subtotal**	**0.3%**	**0.9%**	**0.1%**	**0.6%**
Glass	Recyclable	0.3%	1.2%	0.1%	1.1%
	Glass other	1.1%	1.6%	0.1%	1.3%
	Subtotal	**1.3%**	**2.8%**	**0.2%**	**2.4%**
Textiles	Clothing/textiles	0.2%	2.9%	0.1%	3.2%
	Other textiles	5.4%	9.8%	0.8%	15.7%
	Subtotal	**5.6%**	**12.7%**	**0.9%**	**18.9%**
Sanitary paper	**Subtotal**	**0.0%**	**4.9%**	**0.2%**	**1.8%**
Rubble	Cleanfill	7.0%	1.0%	19.8%	1.0%
	New plasterboard	8.7%	0.2%	0.0%	0.4%
	Other	12.3%	5.2%	0.8%	2.3%
	Subtotal	**28.0%**	**6.4%**	**20.6%**	**3.7%**
Timber	Reusable	6.5%	0.8%	0.6%	1.6%
	Unpainted & untreated	7.7%	4.4%	0.1%	1.9%
	Non-recoverable	37.0%	11.3%	4.8%	24.7%
	Subtotal	**51.2%**	**16.4%**	**5.6%**	**28.2%**
Rubber	**Subtotal**	**0.7%**	**2.6%**	**0.6%**	**1.0%**
Potentially hazardous	**Subtotal**	**0.2%**	**2.7%**	**0.0%**	**0.4%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**100.0%**
Note: Due to rounding, some totals may not correspond with the sum of the separate figures.					

A.10.0 COMPOSITION OF GENERAL AND OVERALL WASTE TO CLASS 1 LANDFILLS

Table 39: Composition of General and Overall Waste to Class 1 Landfills, 2020

Composition of waste to Class 1 landfills - From both regions		General waste - excludes kerbside rubbish and special wastes		Overall waste - includes kerbside rubbish and special wastes	
Paper	Recyclable	5,944	2.1%	14,595	3.0%
	Cardboard	13,284	4.7%	14,245	2.9%
	Non-recyclable	4,782	1.7%	8,080	1.7%
	Subtotal	**24,010**	**8.4%**	**36,920**	**7.6%**
Plastics	Recyclable	1,586	0.6%	4,955	1.0%
	Non-recyclable	36,839	12.9%	49,068	10.2%
	Subtotal	**38,425**	**13.5%**	**54,023**	**11.2%**
Organics	Kitchen waste	15,627	5.5%	57,267	11.8%
	Compostable greenwaste	17,853	6.3%	35,719	7.4%
	Non-compostable green.	4,724	1.7%	6,709	1.4%
	Organics other	2,583	0.9%	6,858	1.4%
	Subtotal	**40,786**	**14.3%**	**106,553**	**22.0%**
Ferrous	Primarily ferrous	4,300	1.5%	5,465	1.1%
	Steel other	6,714	2.4%	8,247	1.7%
	Subtotal	**11,014**	**3.9%**	**13,712**	**2.8%**
Non-ferrous	**Subtotal**	**1,855**	**0.7%**	**3,314**	**0.7%**
Glass	Recyclable	2,353	0.8%	6,343	1.3%
	Glass other	3,659	1.3%	4,683	1.0%
	Subtotal	6,011	2.1%	11,025	2.3%
Textiles	Clothing/textiles	5,583	2.0%	8,684	1.8%
	Other textiles	24,137	8.5%	26,497	5.5%
	Subtotal	**29,720**	**10.4%**	**35,181**	**7.3%**
Sanitary paper	**Subtotal**	**7,872**	**2.8%**	**23,036**	**4.8%**
Rubble	Cleanfill	11,978	4.2%	11,978	2.5%
	New plasterboard	7,657	2.7%	7,657	1.6%
	Other	18,806	6.6%	24,346	5.0%
	Subtotal	**38,440**	**13.5%**	**43,980**	**9.1%**
Timber	Reusable	7,275	2.6%	7,275	1.5%
	Unpainted & untreated	13,421	4.7%	13,421	2.8%
	Non-recoverable	56,587	19.9%	59,382	12.3%
	Subtotal	**77,283**	**27.2%**	**80,078**	**16.6%**
Rubber	**Subtotal**	**4,898**	**1.7%**	**5,576**	**1.2%**

Composition of waste to Class 1 landfills - From both regions		**General waste - excludes kerbside rubbish and special wastes**		**Overall waste - includes kerbside rubbish and special wastes**	
Potentially hazardous	Sewage sludge	0	0.0%	32,093	6.6%
	Other	4,198	1.5%	37,888	7.8%
	Subtotal	**4,198**	**1.5%**	**69,981**	**14.5%**
TOTAL		**284,513**	**100.0%**	**483,380**	**100.0%**
Note: Due to rounding, some totals may not correspond with the sum of the separate figures.					

A.11.0 COMPOSITION OF KERBSIDE RUBBISH

Table 40: Composition of Kerbside Waste to Landfills from both Regions, 2020

Composition of Kerbside Waste from both Regions		Tonnes per annum	% of total
Paper	Recyclable	9,612	7.1%
	Non-recyclable	3,298	2.4%
	Subtotal	**12,909**	**9.5%**
Plastic	#1-7 containers	3,368	2.5%
	Plastic bags/film	8,091	6.0%
	Other non-recyclable	4,138	3.1%
	Subtotal	**15,598**	**11.5%**
Organics	Kitchen waste	41,640	30.7%
	Greenwaste	19,852	14.6%
	Other organic	4,275	3.2%
	Subtotal	**65,767**	**48.5%**
Ferrous	Steel cans	1,165	0.9%
	Other ferrous	1,533	1.1%
	Subtotal	**2,698**	**2.0%**
Non-ferrous	Aluminium cans	511	0.4%
	Other non-ferrous	948	0.7%
	Subtotal	**1,459**	**1.1%**
Glass	Glass bottles & jars	3,990	2.9%
	Non-recyclable	1,024	0.8%
	Subtotal	**5,014**	**3.7%**
Textiles	Clothing/textiles	3,101	2.3%
	Multimaterial/other	2,361	1.7%
	Subtotal	**5,462**	**4.0%**
Sanitary paper	**Subtotal**	**15,164**	**11.2%**
Rubble	**Subtotal**	**5,540**	**4.1%**
Timber	**Subtotal**	**2,795**	**2.1%**
Rubber	**Subtotal**	**678**	**0.5%**
Potentially hazardous	**Subtotal**	**2,579**	**1.9%**
TOTAL		**135,663**	**100.0%**
Note: Due to rounding, some totals may not correspond with the sum of the separate figures.			

A.12.0 LARGE-SCALE WASTE GENERATORS

Table 41: Large Scale Waste Generators, 2021

TA	Large scale* waste generators - as reported by TAs in 2021
Waikato Region	
Hamilton City Council	Fonterra Te Rapa A Dairy Goat DHB NZ Food Innovation TetraPak
Hauraki District Council	Silver Fern Farms
Matamata-Piako District Council	Greenlea Premium meats Fonterra - Waitoa and Morrinsville Wallace Corp in Waitoa Ingham Enterprises Waitoa Silverfern Waitoa and Te Aroha Open Country Dairy
Ōtorohanga District Council	None reported by TA
South Waikato District Council	Reported as unknown by TA
Taupō District Council	Two wood processing plants
Thames- Coromandel District Council	Possibly Fisheries and Forestry
Waikato District Council	Affco (Horotui) Brinks Chickens (Tuakau) Goodman Fielder Quality Bakers (Huntly)
Waipa District Council	Reported as unknown by TA
Waitomo District Council	Two meat processors Two sawmills

TA	Large scale* waste generators - as reported by TAs in 2021
Bay of Plenty Region	
Kawerau District Council	Norske Skog Oji Holdings Sequal Lumber Asaleo Care
Ōpōtiki District Council	None reported by TA
Rotorua District Council	None reported by TA
Tauranga City Council	Tauranga Hospital Port of Tauranga Kiwifruit growers Sealords - Fish by-products. Freezing Works and Butcheries. Meat by-products
Western BOP District Council	Claymark Saw mill – Katikati Affco meat processors - Rangiuru Pukepine – Te Puke Addition Pet foods- Te Puke Maketu Pies - Maketu
Whakatāne District Council	Whakatane Mill (closing July 2021)
Note: "large scale" was defined as "significant" in TAs' questionnaires.	

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A.13.0 ORGANIC WASTE PROCESSING FACILITIES

Table 42: Organic Waste Processing Facilities in Waikato and Bay of Plenty regions

TA	Provider	Materials Processed
	Waikato Region	
Hauraki District	Waste Management NZ Ltd	Greenwaste and putrescibles
	Environmental Fertilisers	Greenwaste, animal/agricultural by-products
	Living Earth	Greenwaste and animal by-products
Matamata-Piako District	Daltons	Bark & putrescible waste composting
	Wallace Group, Waitoa	Animal by-products
	Lowe Corp	Animal by-products
South Waikato District	MyNoke, Kinleith (Tokoroa)	Sludges, agricultural by-products (and recycled paper/fibre), vermicomposting.
	Materials Processing Ltd Kinleith	Converts pulp and paper mill waste into fuel
	MyNoke, Putaruru	Sludges, agricultural by-products
Taupō District	Laminex/MyNoke	Sludges, agricultural by-products, vermicomposting
Waikato District	Envirofert	Composting facility with some vermicomposting, processing greenwaste, household foodwaste and wood/timber
	EnviroWaste	Gore covered windrow for processing green and food waste Vermicomposting operation for commercial food waste
	Soilpro	Greenwaste, wood/timber, animal manures and other organics
	Pacific Biofert	Greenwaste and animal bio-products
	Xtreme Zero Waste	Greenwaste and foodwaste
	Hamilton Organic Recycling Centre (owned by Hamilton City Council, operated by Waste Management)	Greenwaste composting
	Tuakau Proteins Ltd	Animal by-products

TA	Provider	Materials Processed
Waipa District	Revital	Greenwaste, animal manures, and commercial foodwaste processing
	Bay of Plenty	
Kawerau District	EcoCast	Sludges, agricultural by-products and other organics, vermicomposting
	Kawerau Wastewater treatment plant	Greenwaste
Rotorua District	Materials Processing Ltd	Greenwaste, wood waste
Tauranga City	NZ Remediation Te Maunga	Greenwaste composting
	Revital	Greenwaste, foodwaste, animal manures
Western Bay of Plenty District	MyNoke	Sludges, agricultural by-products
	Organic Wastes from Regions Processed Elsewhere	
Auckland	Eco Stock supplies (Auckland)	Food waste
	PVL Proteins (Auckland)	Fish and meat processing waste into fertiliser & tallow products
	EnviroWaste (Product destructions and Resource Recovery Facility)	Food waste

A.14.0 PROJECTIONS METHODOLOGY

Previous research undertaken by Eunomia[39], using regression analysis, found that overall GDP is the most accurate predictor of waste to landfill over time. In addition, household waste correlates with population, while construction activity reflects C&D waste generation. Data was derived from the following sources:

- Statistics NZ population projections were used to generate population-based projections for Waikato and Bay of Plenty regions[40]
- GDP forecasts were based on NZ national GDP to 2028[41]
- Construction activity forecasts were derived from the Ministry of Business, Innovation and Employment and industry data[42]

The growth rates that were applied are shown in the table below:

Table 43: Growth Rates Used in Projections

Year	Waikato Population	BOP Population	Construction	GDP	Waikato Forecast	BOP Forecast
2020	0.76%	0.68%	0.10%	1.70%	**0.85%**	**0.83%**
2021	0.76%	0.68%	-7.3%	4.6%	**-0.65%**	**-0.67%**
2022	0.75%	0.67%	5.5%	5.80%	**4.02%**	**3.99%**
2023	0.75%	0.67%	3.5%	4%	**2.75%**	**2.72%**
2024	0.69%	0.66%	3.5%	2.00%	**2.06%**	**2.05%**
2025	0.68%	0.60%	3.5%	2%	**2.06%**	**2.03%**
2026	0.68%	0.60%	1%	1.90%	**1.19%**	**1.17%**
2027	0.67%	0.60%	3%	2.20%	**1.96%**	**1.93%**
2028	0.67%	0.59%	3%	2.10%	**1.92%**	**1.90%**
2029	0.57%	0.59%	3%	2.10%	**1.89%**	**1.90%**
2030	0.57%	0.50%	3%	2.10%	**1.89%**	**1.87%**

[39] Eunomia (2014) *Incorporating Waste Minimisation Act Data into New Zealand Greenhouse Gas Emissions Estimates.* Report for Ministry for the Environment

[40] Statistics NZ: Subnational Population Projections: 2013(base)–2043

[41] https://www.ibisworld.com/industry-insider/coronavirus-insights/the-global-economic-outlook-for-2021-new-zealand/#:~:text=The%20New%20Zealand%20economy%20is,22%2C%20to%20reach%20%24259.6%20billion.&text=A%20low%20cash%20rate%2C%20increasing,GDP%20growth%20in%202021%2D22

[42] https://www.mbie.govt.nz/dmsdocument/11600-construction-factsheet, https://www.mbie.govt.nz/dmsdocument/13358-construction-factsheet-january-2021 https://nz.finance.yahoo.com/news/construction-zealand-h1-2021-recovery-074800235.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAAFZV3WjfyIQ-Rf7gmo7fD3k5k4-1NmyVQGnkKKlyxLb9G13IhRdKDzzynwvcbWfy2lQMhe3zvV6luODgmrsJCWTJ_eBRMlX358R9z-U857wGtYAcWejBSm133T4m35Kz9zPDOUkzkH9pxaPP5BSNCzsbB8d41XinVvz_ZC8MwL00

Growth rate projections for population were applied to 'Residential' and Kerbside' Activity Source tonnages, while C&D projections utilised construction activity forecasts, and the remaining tonnages had GDP forecast growth rates applied. The resulting projections by Activity Source were then combined to derive an overall tonnage projection. The recovered material composition projection utilized the overall tonnage projection growth rate.

National GDP forecasts were used as no regional forecasts were available. Historic regional GDP tracks relatively closely to national GDP for both the Waikato and Bay of Plenty regions[43], and therefore national GDP is considered to be an appropriate proxy for the purposes of forecasting waste growth.

Projection Detail

The tables below show the detail of tonnage projections for Waikato and Bay of Plenty regions.

Table 44: Waikato Region Tonnage Projections

Year	Recovery	Residual	TOTAL
2020	465,517	308,885	**776,422**
2021	484,693	320,237	**806,951**
2022	477,507	315,489	**795,018**
2023	508,938	336,256	**847,216**
2024	520,279	343,749	**866,052**
2025	533,600	352,550	**888,175**
2026	539,961	356,753	**898,740**
2027	550,529	363,735	**916,291**
2028	561,113	370,728	**933,868**
2029	571,721	377,736	**951,486**
2030	582,523	384,874	**969,427**

Table 45: Bay of Plenty Region Tonnage Projections

Year	Recovery	Residual	TOTAL
2020	380,995	174,495	**557,510**
2021	396,584	180,858	**579,463**
2022	390,597	182,784	**575,404**
2023	416,203	191,199	**609,425**
2024	425,445	194,853	**622,322**
2025	436,229	198,908	**637,162**
2026	441,320	201,546	**644,892**
2027	449,848	205,258	**657,133**
2028	458,385	208,948	**669,361**
2029	467,080	212,717	**681,826**
2030	475,803	216,514	**694,347**

[43] https://ecoprofile.infometrics.co.nz/waikato%20region/Gdp, https://qem.infometrics.co.nz/bay-of-plenty-region/indicators/gdp?compare=new-zealand

Table 46: Estimated Composition of Waste and Recovered Materials in Waikato and Bay of Plenty Regions

Categories	2020	2025	2030
Paper	84,320	96,437	105,200
Plastics	57,150	65,363	71,303
Organics	716,440	819,395	893,858
Ferrous metals	105,457	120,611	131,572
Non-ferrous metals	13,268	15,175	16,554
Glass	44,861	51,308	55,971
Textiles	35,181	40,237	43,894
Sanitary paper	23,036	26,346	28,740
Rubble	63,980	73,175	79,824
Timber	85,078	97,304	106,147
Rubber	18,685	21,371	23,313
Potentially hazardous	70,434	80,556	87,876
Other	12,000	13,724	14,972
TOTAL	**1,329,892**	**1,521,002**	**1,659,224**

Table 47: Estimated Composition of Residual Waste in Waikato and Bay of Plenty Regions

Categories	2020	2025	2030
Paper	36,920	41,064	44,790
Plastics	54,023	60,086	65,540
Organics	106,553	118,513	129,269
Ferrous metals	13,712	15,251	16,635
Non-ferrous metals	3,314	3,686	4,021
Glass	11,025	12,263	13,376
Textiles	35,181	39,130	42,682
Sanitary paper	23,036	25,622	27,947
Rubble	43,980	48,917	53,357
Timber	80,078	89,067	97,150
Rubber	5,576	6,202	6,765
Potentially hazardous	5,981	6,652	7,256
TOTAL	**419,380**	**466,453**	**508,788**

Table 48: Estimated Composition of Residual Waste with all 'Divertable Materials' Diverted for Waikato and Bay of Plenty Regions by 2030

Categories	2020	2025	2030
Paper	36,920	26,807	9,802
Plastics	54,023	57,637	59,529
Organics	106,553	72,547	16,459
Ferrous metals	13,712	8,473	0
Non-ferrous metals	3,314	2,048	0
Glass	11,025	9,128	5,681
Textiles	35,181	34,838	32,147
Sanitary paper	23,036	25,622	27,947
Rubble	43,980	39,211	29,536
Timber	80,078	78,836	72,042
Rubber	5,576	6,202	6,765
Potentially hazardous	5,981	6,652	7,256
TOTAL	**419,380**	**368,000**	**267,164**

A.15.0 ACKNOWLEDGEMENTS

Sunshine Yates Consulting, Eunomia and Waste Not Consulting would like to thank the following council contacts for their assistance is providing information for this project.

Contact	Organisation
Reece Irving	Bay of Plenty Regional Council
Kirsty Quickfall	Hamilton City Council
Renee Wentzel	Hauraki District Council
Andre Erasmus	Kawerau District Council
Louisa Palmer	Matamata-Piako District Council
Anthony Kirikiri	Ōpōtiki District Council
Jared le Fleming	Ōtorohanga District Council
Prashant Praveen	Rotorua District Council
Lynne Kenny	South Waikato District Council
Brent Aitken	Taupō District Council
Sam Fellows	Tauranga City Council
Peter Barrett	Thames-Coromandel District Council
Phillip Ellis	Waikato District Council
Valerie Bianchi	Waikato Regional Council
Sally Fraser	Waipa District Council
Parva Zareie	Waitomo District Council
Ilze Kruis	Western Bay of Plenty District Council
Nigel Clarke	Whakatāne District Council

The authors would like to apologise for the inadvertent omission from this list of any other person who contributed to this study.