Asset Management Plan Summary

Solid waste and resource recovery

Asset management plans

Together, our 14 asset management plans present a detailed description of all the things – roads, cycleways, footpaths, pipes, buildings, vehicles, parks and so on – that the Christchurch City Council owns, across all areas of work, and how these 'assets' are planned, managed, operated and funded.

All our assets, with a collective replacement cost estimate of $16.8 billion, belong to ratepayers and are managed and operated on their behalf. Ensuring our assets are appropriate for the city's needs enables us to deliver the services that make Christchurch and Banks Peninsula a great place to live, work and visit.

Asset management plans are technical documents. The summary documents give an overview of how we manage our assets through their lifecycles to ensure we deliver services in cost-effective ways.

For the first time, we have published these documents online as part of our commitment to transparency.

What we do

We are responsible for waste management and minimisation, with the aim of reducing the amount of waste that goes to landfill. Our work in this area includes:

- Education initiatives
- Kerbside collection services
- Safely managing hazardous substances
- Organics processing
- Processing recyclable materials
- Transfer stations and community collection sites
- Managing closed landfills

Why we do it

We ensure the Council meets its statutory requirements under several acts of parliament and we update our Waste Minimisation Plan every six years. The Council adopted the 2020 Waste Minimisation Plan in October.

Our work supports a healthy environment and sustainable use of resources by encouraging reuse, recycling and composting.

This all supports the Council's vision:

> *Christchurch is a prosperous city, in a clean, healthy and sustainable environment, where each person, business and organisation takes responsibility for waste minimisation and actively works towards zero waste to landfill.*

Christchurch City Council

Our assets

Assets covered under the Solid Waste and Resource Recovery portfolio are largely managed through operations contracts, which include asset management requirements and return of assets at the end of a contract.

For this asset management plan, our assets are:

- Transfer stations and community collection points
- The Organics Processing Plant
- Burwood Landfill gas collection and treatment plant
- Closed landfills

Our portfolio can be split into three groups of assets, as below.

Resource recovery assets

Asset category	Quantity
Waste collection	
Banks Peninsula transfer stations	2
Community collection points	12
EcoDepots and Transfer Stations	3
Waste processing	
Materials Recovery Facility	1
Organics Processing Plant – Composting	1
Closed landfills	
Burwood gas collection and treatment plant	1
Burwood landfill gas wells	37
Other closed landfills	56
TOTAL	**113**

Where we've come from

Council waste services have changed over time as new ways of dealing with waste have been developed.

Waste diversion targets and development in 2005 of a single regional landfill (Kate Valley) have driven the development of waste processing sites including the materials recovery facility (EcoSort), the organics processing plant and the transfer station recycling centres.

We own the land for each site and the buildings at the organics processing plant and transfer stations, however the sites are operated and managed under contracts.

Waste collection is managed through a service contract and we are no longer responsible for the bin infrastructure or the collection truck fleet.

Today, our services are largely contracted out, enabling us to focus on service delivery, waste minimisation education and new services.

Our issues and risks

In this asset management plan we provide a snapshot of the greatest risks recorded for Solid Waste and Resource Recovery and summarise the main mitigations.

Our assets are vulnerable to a wide range of risks, from issues such as climate change and natural disasters through to inherent operational risks, such as workplace hazards or not complying with a consent. These are outlined in the asset management plan, along with the mitigations we've planned.

What it costs

Our proposed budget for the activity that uses these assets in Year 1 of the LTP is $67.7 million (total activity net cost of service plus capital spend for 21/22), with the net operational expenditure projected at $47.68 million (net cost of service) and capital expenditure at $20 million (total capital spend). Tables for each area of spending are included in our activity plan.

**The proposed operational and capital programme is indicative only. It will be updated through the LTP 2021-31 capital prioritisation process.*

How we're funded

We receive a mix of Council funding from rates, including a targeted rate. We also receive revenue from our landfill operation, organics processing and the waste disposal levy, which all help to offset some of the significant costs of providing our services.

How it's delivered

Delivery is via a combination of Council staff and tendered long-term contracts with private providers.

We engage specialist contractors to deliver resource recovery and waste services because of the complexity of this area of Council business. It is vital that we appoint contractors with the necessary expertise and capabilities to deliver this core service.

Staff deliver:

- Management of external contracts and contractor performance
- Asset planning and management
- Management of Burwood Landfill gas recovery
- Closed landfill management
- Education programmes

Contractors deliver:

- Maintenance, project management, technical expertise
- Transfer station operations
- Kerbside collections
- Organics processing
- Recycling processing, including glass screening
- EcoShop operations
- Burwood Recovery Park operations (closed to new materials from December 2020)
- Kate Valley Regional Landfill

Delivery partners:

- Canterbury Waste Joint Committee and staff group of eight other Canterbury territorial local authorities
- Canterbury Regional Landfill Joint Committee and Transwaste Canterbury (Kate Valley Regional Landfill)

Our functions and services

We are responsible for collecting, transporting, processing, recycling, composting and disposing of solid waste materials and hazardous waste in ways that minimise harm to people and the environment.

We provide services throughout the district to achieve this to ensure Christchurch is a healthy and well-functioning city.

Our education and promotion services are driving behaviour changes that will lead to fewer materials being sent to landfill, with more materials being reused or composted.

Composting of green waste significantly reduces the amount of methane generated by landfills. We collect methane gas from our closed landfills and use it as an energy resource at Council facilities, thereby reducing greenhouse gas emissions.

We monitor closed landfills and manage them to prevent soil and groundwater contamination.

We focus on circular economy approaches that support a more sustainable and thriving local economy.

We aim to optimise investment and outcomes within the constraints of finance, service levels and resources.

While managing our assets to meet agreed levels of service, financial prudence demands that we optimise asset lifecycle costs, so our management planning also aligns to the stages of an asset's lifecycles. Our renewals programme considers the condition of assets, not just their age.

Asset maturity assessment

The maturity assessment for our assets shows we are performing at an intermediate level in most areas. The average score was assessed as 52 percent, with the target being 67 percent. More detailed information about this is included in our asset management plan.

This was our first maturity assessment, so comparisons with previous assessments are not possible.

January 2021

Resource Recovery Asset Management Plan

Christchurch City Council

Table of contents

1 Summary of the Activity

1.1 Activity Description

1.1.1 What do we do?

The Vision of the Council's statutory Waste Management and Minimisation Plan 2020 is:

Ōtautahi-Christchurch is a sustainable city, working towards zero waste and a circular economy

This is achieved by the management of education initiatives, kerbside collections services, a used products reuse facility, an organics processing plant, a materials recycling facility, and transfer stations and community collection facilities, in order to minimise residual waste, before being sent to landfill. The activities therefore support a healthy environment and sustainability of resources by facilitating education, reuse, recycling and composting.

Solid Waste and Resource Recovery Services
Domestic kerbside collection for organic material (food and garden waste)
Domestic kerbside collection service or community collection points for recyclable materials for households and businesses (domestic quantities only)
Domestic kerbside collection service or community collection points for residual waste (refuse) for households and businesses (domestic quantities only)
Organics processing, including operation of the Organics Processing (composting) Plant
Recycling processing, leased site for Materials Recovery Facility – operated by a CCTO
Landfill gas capture, treatment, reticulation, construction and demolition from the closed Burwood landfill site
Operation and aftercare of closed landfills
Receiving, processing, recovery and disposal of residual construction and demolition waste through the Burwood Resource Recovery Park (concluded in 2019), processing and disposal of special waste - contaminated soils (until end 2020).
Public Transfer Stations and associated Recycling Centres. Receipt and processing of residual waste, recyclable materials, reusable items and organic material (garden waste)
Residual waste transportation to landfill

1.1.2 Why do we do it?

Council operates a waste collection service in accordance with the Local Government Act (2002). In addition it is a legal requirement under the Waste Minimisation Act 2008 to develop a Waste Management and Minimisation plan that must

be reviewed, and updated as necessary at least every 6 years. This enables local authorities to develop a framework to support a reduction of waste tonnages sent to landfill and longer term goal towards zero waste. The Waste Management and Minimisation plan for 2020 was adopted in October 2020 and provides the strategic direction for Solid Waste and Resource Recovery services.

The Ministry for the Environment collects a waste disposal levy, for every tonne of waste sent to landfill (currently set at $10/tonne, with increases through to $60/tonne in 2024). CCC currently receives ~$1.5M p.a. from this levy to spend 'only on matters to promote or achieve waste minimisation' and 'in accordance with its waste management and minimisation plan'.

Other Key legislation also relating to Resource Recovery activities include:

- Local Government Act 1974 and 2002
- Hazardous Substances and New Organisms Act 1996
- Health Act 1956 and amendments
- Resource Management Act 1991
- Health and Safety at Work Act 2015
- Building Act 2004
- Waste Management Bylaw 2008 (and the Kerbside Collection and Waste Collection Points Terms and Conditions)
- Cleanfill and Waste handling Operations Bylaw 2015

The Healthy Environment Community Outcome contained in CCC strategic Framework includes 'Sustainable use of Resources' which includes that "each person and organisation works towards zero waste".

The activity also supports the Council's Strategic Direction of "A Sustainable 21st Century city" by maximising the recovery and reuse of resources from the waste stream.

1.1.3 How much does it cost?

Council's Resource Recovery net operational expenditure is approximately $56m a year, with significant collection, materials recovery processing, transport and landfill costs.

Council fund service costs through a combination of rates funding through the Universal Annual General Charge and an additional targeted rate. Revenue from Landfill operation, Organics Processing and the landfill levy all contribute to offset some of the costs of the services provided.

1.1.4 Why is it delivered?

Resource Recovery has long term services agreements in place for Kerbside Collection and the associated processing of kerbside material collected. The management of the associated CCC Assets is specified in the respective contracts listed in Section 6.3 below.

The functions and services provided are as set out in the Activity Plan for the draft Long Term Plan (Trim: 19/1491499).

1.1.5 Overview of assets

Transfer Stations:	Other assets:
Barrys Bay	Organics Processing Plant
Birdlings Flat	Materials Recovery Facility site lease (Parkhouse)
Styx Mill	Canterbury Waste Services commercial lease (Parkhouse)
Metro Place	Burwood gas collection and treatment plant
Parkhouse	Closed Landfills
Community Collection Points (Banks Peninsula) x12	

1.2 Where have we come from and where are we heading

1.2.1 Background

Council provides both kerbside and dropoff facilities for residential waste, organics and recycling. Traditional council run landfills, where residents could discard unwanted material directly to the tipping face have been replaced with high tech collection and resource recovery systems and any residual waste is now sent to a single regional landfill, owned by joint venture between Canterbury Council's and a commercial waste management company.

1.2.2 Looking Forward

Council's waste services are designed to adapt to the changing needs of our residents. Historically this has included the shift to a three bin kerbside collection system and looking forward it will include a review of the innercity collection and access to recycling markets. As the ability to divert waste through offshore processors changes so too may the treatment and therefore service arrangements provided by Council.

Council produces a Waste Management and Minimisation Plan every six years. This Plan provides the strategic direction for any further asset investment or modification of services with a long term view to 2030.

Councils commitment towards net carbon neutrality by 2045 will also influence our collection and transport networks with a view to reducing vehicle emissions – this may significantly impact how services are delivered in the future.

1.3 Successes, Issues, Opportunities and Risks

1.3.1 Successes

Recent accomplishments include;

- High satisfaction rating by residents (80% for recycling, 85% for residual waste and 81% for organics);
- Overall reduction in refuse to landfill from kerbside;
- A successful trial for a household battery collection scheme with a total of 7,436 kg collected over 12 months or an average of 620 kgs per month;
- RFID tagging of wheelie bins 99% completed;
- Diversion of 35,000 tonnes of recycling, and 53,000 tonnes of organics per year;
- A consistent supply of landfill gas from closed Burwood landfill, and the closure of Burwood landfill for post-earthquake related wastes.

1.3.2 Strategic Issues and Risks

Strategic Issues	**Responses**
Changing international markets for recyclables; and New Zealand's recycling infrastructure and capacity enhancements	Working with Ministry for the Environment, WasteMinz, our contractors, Canterbury councils and other councils to achieve improved outcomes
Reliance on fossil fuel driven collection trucks	Work with contractors to expand the number of electric powered collection trucks
Expanded inner city kerbside collection options	Develop an options report

Excessive, wasteful consumption and new composite products overwhelming our ability to recycle or compost	Advocating for product stewardship schemes where the manufacturers take responsibility for their products or simply products so they can more easily be recycled or composted; Contribute towards national initiatives via Ministry for the Environment and other sector organisations, and councils
Natural hazards such as floods, sea-level rise or tsunami impacting on closed landfills and waste facilities.	Asset management to ensure waste infrastructure remain resilient to natural hazards.

The benefits of adopting these approaches include a more vibrant, sustainable and resilient local economy with new job opportunities, local manufacturing, greater self-reliance and less demand on our natural and physical resources.

2 Introduction

This section provides the context, purpose and objectives of the AMP and described the development and review process.

2.1 Background

This asset and activity management plan (AMP) is the basis for Resource Recovery activity planning. The purpose of this plan is to demonstrate responsive management of assets (and services provided from assets), compliance with regulatory requirements, and to communicate funding needed to provide the required levels of service over a 30-year planning period.

The objective of asset management is to:

"Deliver the required level of service to existing and future customers in the most cost-effective way."

In this context the specific objectives for this AMP are:

- To define the services to be provided, the target service standards that Council aims to achieve, and the measures used to monitor the performance of the Resource Recovery activity.
- To translate Council's Strategic Vision and Goals into activity strategies and action plans. The plan identifies forward works programmes based on strategic outcomes sought and financial forecasts required to meet agreed service levels and cater for growth.
- To demonstrate responsible management of the Resource Recovery activity infrastructure to stakeholders, ensuring that public funds are optimally applied to deliver cost effective services to meet customer expectations.
- To document current asset management practices used by CCC based on clear evidence as part of a sustainable and optimised lifecycle management strategy for the Resource Recovery infrastructure, and identify actions planned to enhance management performance.
- To comply with the requirements of relevant legislation.

The key outputs of this AMP are inputs into the 2021-2031 10 Year Plan process, which will be the subject of a special public consultative procedure. The intention of this AMP is to set out how Council manages Resource Recovery assets and services in a way that is appropriate for a readership including elected members of the Council, executive management, interest groups and business partners associated with the management of the Resource Recovery activity along with interested members of the community. It covers the services that are provided from ownership and management of the associated assets.

This AMP covers a period of 30 years commencing 1 July 2019. Operational, maintenance and renewal programmes for the first 3 years are generally well defined with reasonable certainty of being implemented to budget as planned. Beyond this period, work programmes are generally based on projected trends and demands and there is less certainty with respect to scope and timing of the projects. All expenditure forecasts are based on unit costs as at 1 July 2019.

2.2 Relationship with other plans

Many of the assets planning activities undertaken by Council are applied to all infrastructure assets. For this reason, Council has developed asset management plans in two parts. A strategic asset management plan (SAMP) document which provides an overview of asset management planning at the Council, and an AMP document for each asset group which describes the assets and how the principles contained within the SAMP are applied to the management of the assets.

Figure 2-1 depicts the relationship between the various processes and levels of planning within the Council required to deliver on Council's vision and goals.

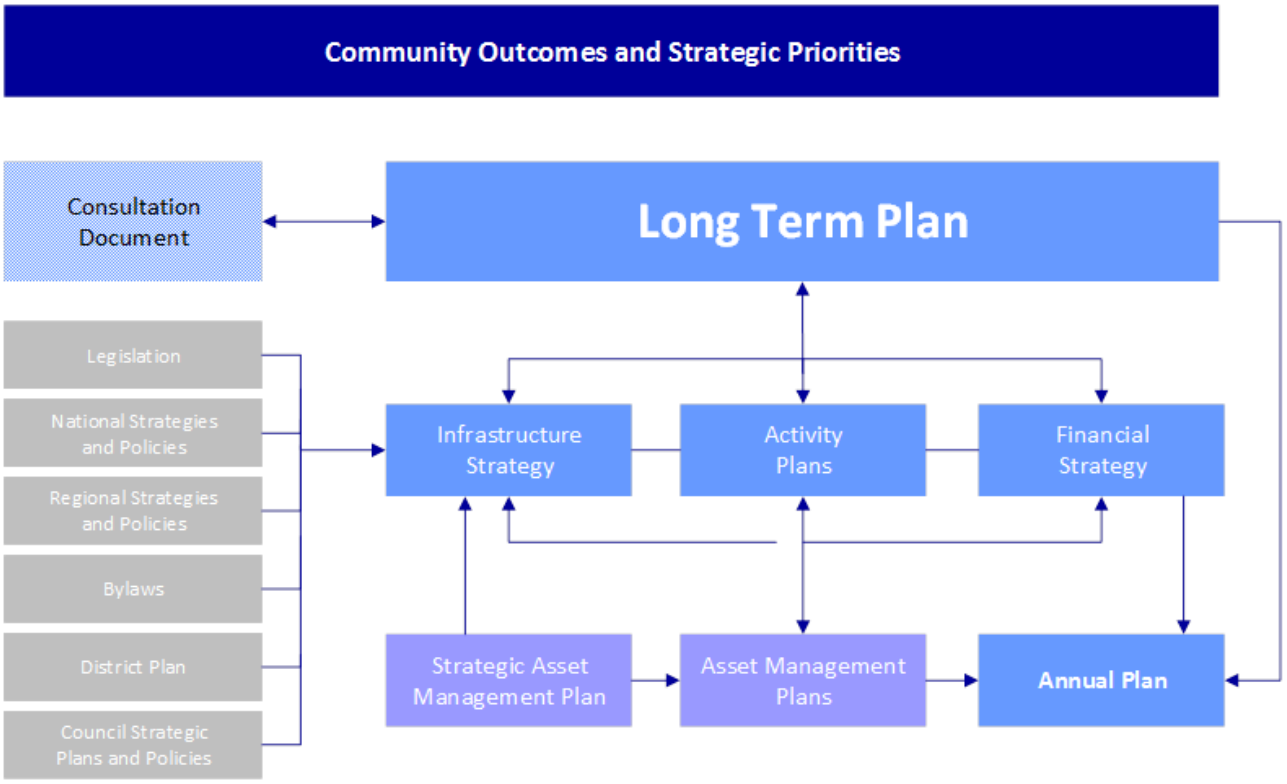


Figure 2-1: Council's Planning Framework

The SAMP provides an overview of the linkages between asset management planning and the other business processes of Council, such as strategic planning, risk management, financial management and compliance. Throughout this AMP references to the SAMP are frequently made.

The SAMP also describes the linkages between AMPs and other corporate plans and documents. In addition to these corporate documents, the following documents are specifically relevant to this AMP:

- Resource Recovery Activity Plan
- Waste Management and Minimisation Plan (2020)

2.3 Delivering on Council's Strategic Framework

2.3.1 Alignment of Outcomes, Priorities and Activity Objectives

Council's strategic framework and general implications for the activities are presented in Council's Strategic Asset Management Plan. The table below summarises key responses by the activity to contribute to the community outcomes and strategic priorities.

Primary Outcome	Sustainable use of resources	Reducing, reusing, recycling and recovering resources from the waste stream maximises the efficient use of our natural and physical resources.
	Safe and healthy communities	Providing services and facilities to collect, process, transport, recycle, compost or dispose of solid and hazardous waste in ways that minimise harm to people and the environment.

Secondary Outcome	Modern and robust city infrastructure and community facilities.	Well managed solid waste services and facilities are a vital part of a healthy and functioning city.

Table 2-1: Alignment of Outcomes, Priorities and Activity Objectives

2.3.2 Activity Responses to Strategic Priorities

Council has confirmed the following strategic priorities requiring specific focus for the next LTP. In response to these priorities, this AMP includes a number of responses as tabulated below, with reference to the relevant section in the AMP where further detail on responses is provided. Responses to natural hazard risks and building resilience are dealt with in Section 5.

Strategic Priorities	ACTIVITY RESPONSES
Enabling active and connected communities to own their future	Waste minimisation services and education encourage community awareness and local action. Many waste reducing activities support stronger communities such as composting at community gardens, the sharing of surplus food, tool or toy libraries and Eco-Shop supporting low income households. Recycling services are provided to schools to encourage learning and personal action.
Meeting the challenge of climate change through every means available	More efficiently using natural resources reduces greenhouse gas emissions. Composting organic material such as food scraps and garden trimmings that would otherwise be landfilled significantly reduces methane generated by landfills. Landfills produce methane a powerful greenhouse gas. This activity collects landfill gas to use as an energy source which significantly lowers greenhouse gas emissions. The cost of waste disposal includes a carbon charge established through the New Zealand Emissions Trading Scheme. This cost is passed on to customers which pays for off-setting landfill emissions. Some kerbside collection routes already use electric vehicles. This could in future be expanded.
Ensuring a high quality drinking water supply that is safe and sustainable	Managing illegal dumping and littering is important to support community wellbeing and the health of our environment, waterways and oceans. Landfill leachate, released as materials degrade can be a source of contamination for soil and groundwater. This activity carefully monitors and manages landfill leachate from closed landfills.
Accelerating the momentum the city needs	Circular economy approaches support a more sustainable and thriving local economy.

	Flexible inner-city waste and recycling collection services support central city living. Kerbside collection services can affect pedestrians, cyclists and other road users. Wherever possible, collection is managed and timed to limit disruption.
Ensuring rates are affordable and sustainable	The diversion of waste from landfill has numerous environmental benefits, it also costs less. By maximising resource recovery services and diverting waste from landfill this activity supports rates affordability. Examples include rating only for those that receive a particular resource recovery service, and high level of management o*f* long term *contractors.*

Table 2-2: Contribution of the Activity to the Strategic Priorities

2.4 AMP Development Process

This AMP review was carried out during 2019 by asset managers, led by the Asset Management Unit (AMU) and covering all Christchurch City Council (CCC) AMPs. The broad timeline is shown below.

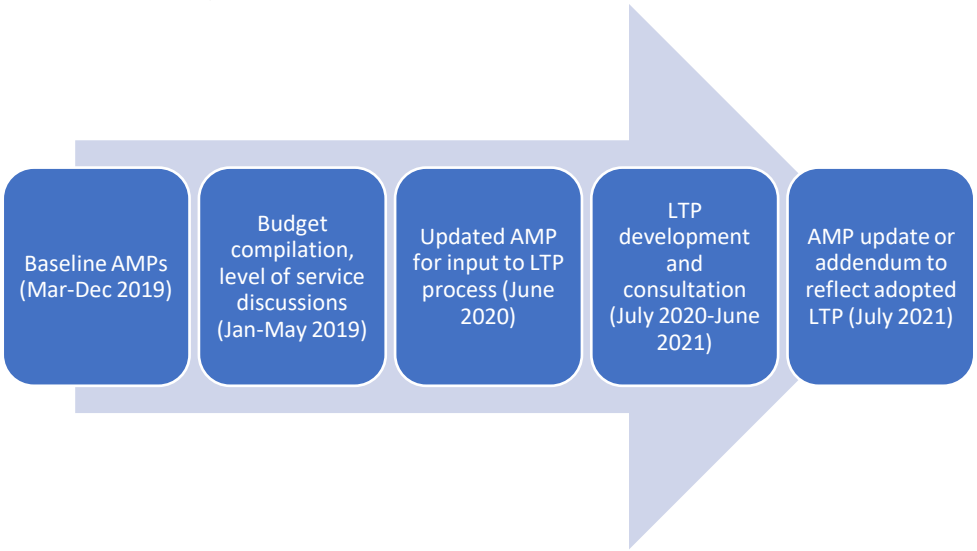


Figure 2-3: AMP Development Timeline

This AMP has been prepared as a team effort by officers dedicated to and trained in AM planning. This team has been supervised and the AMP internally reviewed by professional Council staff having over 10 years' experience in preparing AMPs with guidance from an external asset management specialist.

2.5 Navigating the AMP

The AMP follows the general format for AM Plans recommended in Section 4.2.6 of the International Infrastructure Management Manual. It comprises a series of logical steps that sequentially and collectively build the framework for sustainable asset management for the activity it serves.

Key elements of the plan are

- Levels of service – specifies the services and levels of service to be provided by the organisation,
- Future demand – how this will impact on future service delivery and how this is to be met,
- Life cycle management – how Council will manage its existing and future assets to provide defined levels of service,
- Financial summary – what funds are required to provide the defined services,

- Asset management improvement plan – the current and desired state of asset management practices and how the plan will be monitored to ensure it is meeting organisation's objectives.

3 The Services we Provide

This section outlines the drivers for the level of service requirements, sets out the proposed levels of service and performance measures, provides information on how Council has been performing in recent years against those requirements and identifies projects and programmes aimed at addressing any level of service gaps. (Levels of service gaps are where performance results achieved are consistently different from performance targets).

3.1 Level of Service Drivers

3.1.1 Customers and Stakeholders

Understanding service expectations from customers and stakeholders helps to inform what is important to customers and therefore what aspects of performance should be measured.

Customer Satisfaction with Services provided including accessibility of drop-off facilities and convenience and reliability of kerbside collections, Waste diversion from landfill, Consent compliance, Quality of recovered products and liaison with Central government on Waste policy and strategy.

Key Stakeholders and customer expectations across Resource Recovery include:

Customer/ Stakeholder Group	Service Expectations
All residents/ratepayers	*Providing accessible services and facilities to collect, process, transport, recycle, compost or dispose of solid and hazardous waste in ways that minimise harm to people and the environment. Kerbside collection services satisfaction rates rank amongst the highest of all Council services*
Regional Council	*Compliance with resource consents for operational facilities*
Territorial Authorities (Neighbouring authorities)	*Collaboration and communication around waste minimisation and systems integration.*
Central Government (Ministry for the Environment)	*Working with Central Government to meet the requirements under the Waste Minimisation Act and NZ Waste Strategy, liaison on emerging issues including support and alignment with the Government's work program on waste.*

Table 3-1: Customer Expectations

Customer expectations are defined through a number of mechanisms, including our annual resident survey, public consultation on our Waste Minimisation and Management Plan and through customer enquiries and feedback.

3.1.2 Legislation/Regulation

Alongside customer expectations, we consider legislation, regulation and standards that impose level of service standards for Resource Recovery.

Legislation / Regulation	Impacts on Levels of Service
Building Act 2004	*Ensure all drop-off facilities are safe and accessible to the public.*
Resource Management Act 1991	*Compliance with discharge consents for facility operations*
Waste Minimisation Act 2008	Drives the diversion of waste from landfill

Waste Management Handling and Cleanfill Bylaw 2015	Ensure safe and responsible operation of Resource Recovery contractors and commercial service providers

Table 3-2: Legislative and Regulatory Level of Service Drivers

In addition to the above drivers, the following Acts of Parliament and National Standards are also applicable to the activities associated with Resource Recovery.

Acts of Parliament	Content/Purpose
Health Act 1956	• Regulation and protection of public health in the district. • Requirement to provide 'sanitary works' which includes Resource Recovery services
Waste Minimisation Act 2008	• Encourage waste minimisation and reduce in waste. • Waste Disposal Levy on every tonne of waste sent to final disposal. • Requirement that a Waste Management and Minimisation Plan be developed and implemented. • The Waste Management Plan must consider in order of priority, the reduction, reuse, recycling, recovery, treatment and disposal of waste. • Bylaws. • Reporting and audit waste data.
Public Works Act 1981	• Acquisition or disposal of land required for public works.
Resource Management Act 1991	• Sustainable management of natural and physical resources. • Avoid, remedy or mitigate adverse effects on the environment. • Compliance with district and regional plans. • Take into account the principles of the Treaty of Waitangi. • Comply with resource consents issued by an Authority for the construction and operation of Resource Recovery management facilities.
Biosecurity Act 1993	• Compliance with national or regional pest management.
Local Government Act 2002	• Schedule 10 requirements and particularly community outcomes, asset management implications, levels of service, financial information, significant negative effects, forecasting assumptions, uncertainties and risks and the financial requirements. • Requirement that a Waste Management Plan be established and implemented. • Levels of Service and Performance Targets in the LTP. • Sections 76 / 81 - Decision-Making. • Sections 82 / 90 – Consultation. • Section 539 of the Local Government Act 1974 requires the Council to adopt a waste management plan that makes provision for the collection, reduction, reuse, recycling, recovery, treatment and disposal of waste. • Amended in 2012 to change the purpose statement of local government. They have removed local government's focus on promoting the social, cultural, economic, and environmental wellbeing of communities – the "four well beings". The legislation has reoriented local government towards cost-effectiveness and financial prudence.
Civil Defence Emergency Management Act 2002	• A local authority must plan and provide for civil defence emergency management within its district and maintain services to the fullest extent possible.

Acts of Parliament	Content/Purpose
Health and Safety at Work Act 2015	• Responsibilities include evaluating the hazards, and assessing the levels of risk associated with Council assets and places of work, and taking all practicable steps to either eliminate, isolate or minimise the hazard). Council needs to assess what level of risk it feels is appropriate, and what measures it considers as practicable for hazard mitigation in the context of the Act.
Building Act 2004 Summary Offences Act 1981	• Compliance with building consents and warrant of fitness issued under the act and relevant regulations and standards. • Determines powers to deal with offences including infringements.
Litter Act 1979	• Sets controls for litter and illegal waste disposal occurrences.
Hazardous Waste and New Organisms Act 1996	• Relates to waste management primarily through controls on the import or manufacture of new hazardous materials and the handling and disposal of hazardous substances.
National Environmental Standards (NES)	• No national environmental standards with reference to waste have been developed yet. However the following guidelines affect waste management: o air quality; o water quality; o odour; o cleaner production; and, o landfills (including full costing guidelines). o The Ministry for the Environment is in the process of developing a Proposed NES for Outdoor Storage of Tyres.

Table 3-3: National legislation, relevant to the Resource Recovery Activity

Other Regulations	Content/Purpose
Land and Water Regional Plan 2016 (LWRP) – Environment Canterbury	Sets controls for the discharge to the environment of any substance includes Hazardous substance storage controls, deposition of waste to land and discharge of waste water from for example Hydro-excavation works.
Resource Recovery Handling and Cleanfill Bylaw 2015 - CCC	Establishes a licensing classification for waste activities and sets acceptable limits on deposition of waste to land including clean fill.

Table 3-4: Regional and local regulation

3.1.3 Strategic Framework

Council's resource recovery activity is strongly aligned with national waste policy and guidance, defined under the Waste Minimisation Act (2008) and associated requirements, including the development and maintenance of a Waste Minimisation and Management Plan. Current strategic direction as defined in our Waste Minimisation and Management Plan 2020.

See Section 2.3.1 above for a discussion of the Resource Recovery activity's alignment with the Council's Strategic Framework.

3.2 Defining and Measuring Levels of Service

3.2.1 Measuring our Levels of Service

Council measures Levels of Service in the annual Activity Plan, see Section 3.2.3 below.

3.2.2 How we plan to be performing?

Overall Council's Resource Recovery services are performing well, with customer satisfaction and the provision of services and facilities rated highly. However, acknowledging the significant changes both in international recycling markets and in Government policy towards waste, Council will need to maintain an agile and adaptive service offering to maintain value for money and meet the expectations of our communities. For this reason the Asset Management Plan is closely linked to our Waste Minimisation and Management Plan 2020 and the objectives and actions defined in it and the associated Action Plan.

3.2.3 Performance Framework, 2021-2031

The Council's Waste Management and Minimisation Plan (WMMP) contains the vision, goals and targets for Resource Recovery. The 2020 Plan includes a detailed Action Plan which outlines key projects to meet our defined Levels of Service.

Levels of Service, contained in the Activity Plan, provide the performance measures to ensure we continue to meet our customers' expectations. See Section 5 of the Council's Draft Activity Plan Resource Recovery 2021 (19/777095). Key performance measures include the quality of materials collected, the volume of waste collected and diverted from landfill, environmental compliance at our sites and customer satisfaction with our services.

The annual Service satisfaction survey provides key performance standards for resource recovery including a critical measure of customer satisfaction with kerbside collections (benchmarked as >80%).

3.3 Level of Service Projects and Programmes

In order to meet our Level of Service targets, Council have developed a detailed Action Plan as part of our Waste Management and Minimisation Plan 2020.

Refer to Section 7.4 for the projects and programmes in CPMS. These are the projects or programmes that are planned to close the gap between the current and target level of service.

4 Demand for our Services

This section provides details of growth and demand forecasts that affect the management, provision and utilisation of services and assets. New works will be based on the information outlined in this section.

4.1 Demand Drivers

There are many factors influencing the demands on Resource Recovery services within Christchurch City. They can generally be summarised under the following headings:

- Customer expectations
- Improvements in technology
- Population shifts
- Economic outlook

4.1.1 Customer Expectations

Changes in community expectations will have implications for the waste management systems we deliver. These changing expectations imply lower tolerances for residual waste going to landfill and options to increase the ease and options for resource recovery, e.g. recycling bins on city streets.

The trend towards sustainable living is expected to continue and potentially to accelerate due to increasing awareness, perceived urgency, and social pressure. Sustainable living includes reducing consumption and generating less waste.

High levels of community engagement, and strong responsibility by individuals and businesses towards minimising their waste, are seen to be essential to the ultimate success of waste minimisation initiatives. For this reason, the waste behaviour of Christchurch residents and businesses is expected to continue to improve, assisted by future waste minimisation initiatives taken by The Council and others.

The Council's target sustainability programme for businesses includes a waste minimisation focus area that identifies opportunities for reducing waste disposed to landfill. This will also have an impact on business customers' expectations and their behaviours both of which will impact future demand for waste and resource recovery services.

Education and raising awareness to increase participation and compliance with kerbside collections and general waste minimisation is a key Council focus for its waste minimisation programmes and this is provided by a specialist team. Key advice for ratepayers and waste minimisation programmes are continually being identified and these will continue to be rolled out as individual messages in order to maximise potential impact and effectiveness. The success of these programmes will be reflected in the changes in the customers' expectations.

In summary, customer opinion is to be gathered frequently and more robustly as part of increased consultation, as detailed in the improvement plan.

The table below summarises the predicted impact of customer expectations on Resource Recovery services delivery and asset management.

Demand factor	Present position	Projection	Impact on services
Community Expectation	Equivalent to mainstream	Better environmental outcome	The way the waste is dealt with.
	Make up of Waste Steam Diverse	Attempt to reduce	Improved Recycling. Reduction in waste to landfills

Table 4-1: *Customer Expectations Projections and Impact on Services*

4.1.2 Improvements in Technology

Technological change has the ability to impact on the demand for Resource Recovery services. These changes can reduce or increase the demand for Resource Recovery infrastructure. Relevant examples are:

- New developments may lead to better recovery systems and reductions in waste before it enters the Council's waste streams.
- Reductions in recyclable materials (e.g. impacts of changes in packaging waste or a container return scheme for beverage containers) could reduce current viability of recycling. As lower recycling volumes increase the average cost of processing.
- Market volatility – Current uncertainties in the market have seen a significant drop in prices paid for recycling commodities. Advancements in technology can improve recycling quality which along with changes in commodity markets may increase revenue and or diversion of recyclable products.
- New waste streams may enter the market and should be recoverable and have an avenue for disposal. The Council has a policy of collecting material for recycling where there is an established market.
- RFID tags are being retrofitted to half a million wheelie bins in service to aid identification and ensuring correct entitlements are provided to property owners. This technology can also be used to identify miss-appropriated bins and prevent lifting contaminated bins.
- The current Waste Management NZ owned diesel powered vehicle fleet used for kerbside collections will from 2019 be progressively changed to electric trucks to reduce greenhouse gas emissions. It will also result in lower fleet management costs.

In summary, most technological changes will generally be around improved recycling and the effect of these on service delivery will be the minimisation of waste to landfill.

4.1.3 Population Shifts

Population Growth

The latest population projection suggest that Christchurch City should be prepared for significant population growth over the next 30 years. Following the 2010/2011 earthquakes there was an initial decrease in the Christchurch population. The population has now recovered and the city continues to grow.

Additionally, there is an agreement in place between the Greater Christchurch Partnership that Christchurch City will receive at least 70% of the total growth across the partnership area from 2028 onwards[1]. Assuming that the right levers are pulled and this comes to fruition, Christchurch can expect to see additional growth on top of what the projections suggest we may see.

Over the past 10 years we have seen a strong population shift to the north and west of Christchurch City. Throughout the next 10 years we will see continuing growth in the Greenfield areas in the north and the west; as the Greenfield areas begin to reach capacity growth in infill areas will become more predominant, particularly in the long term.

The Christchurch City population forecasts are presented in the table below.

Forecast	*2013*	*2021*	*2031*	*(2021–31)*	*2051*	*(2031-51)*	*Total increase (2021-51)*
Households	*138,300*	*156,840*	*172,540*	*(+15,700)*	*197,835*	*(+25,295)*	*40,995*
Population	*356,700*	*400,160*	*439,438*	*(+39,278)*	*490,752*	*(+51,314)*	*90,592*

1 As set out in 'Our Space' – Greater Christchurch Settlement Pattern Update

Table 4-2*: Household[2] and Population Forecast[3]*

The predicted impact of population factors on Resource Recovery services delivery and asset management.

Demand factor	Base Year	Projection	Impact on services
Population	356,700 (2013)	490,752 (2021-51)	Increase in landfill capacity. Increase in all other aspects of Resource Recovery services and assets.
Demographic		StatsNZ population projections suggest that the number of residents over 65 years of age would increase significantly in next 10-40 years.	(i) Changes to waste stream. (ii) An improved kerbside recycling and rubbish for the ageing population through alternative bins sizes, colour coded bins, touch identifiable bins for the vision impaired and alternative service provision. However, demographic factors are unlikely to have a significant impact on the major waste management facilities.

Table 4-3*: Demand Factors, Projections and Impact on Services*

Tourism/Visitors

The overall accommodation capacity of the Canterbury region has decreased since the earthquakes, particularly hotels and backpacker accommodation. International guest nights were down 32% in the Canterbury region in September 2011 (compared with September 2010) and domestic visitors down 23%[4]. Changes in tourism will also affect waste streams in the city and this is expected to be the case over the period covered by this AMP.

4.1.4 Economic Outlook

Economic Growth

The Christchurch rebuild has generated considerable economic activity. Modelling[i] by MBIE shows that the peak of the rebuild activity was reached around mid-2014 and has stayed at a high level, but is expected to decline to about half of the current level to return to pre earthquake levels of activity in 2021/22. Annual growth in Canterbury GDP[ii] has average 6% per annum between 2000 and 2016, although in the 2015 and 2016 March years it decline to 4.4% and 3.5% respectively.

[4] Parliamentary Research Paper. (December 2011) Economic Effects of the Canterbury Earthquakes.

There is a recognised link between economic growth and increasing per-capita waste generation, emphasised by the Covid-19 impacts. This is because a positive economic outlook and a more prosperous economy generally lead to people having more disposable income and spending more, and disposing more. The amount of disposable income available allows people to spend more on products and services that generate more materials for disposal which require resource recovery services.

The 2010/11 earthquakes showed a rise in waste per capita and peaked at 2014 when most EQ work was being completed. Waste generation has since flattened and has slowly started to decline. The immediate impacts of the covid-19 pandemic are projected to create an economic down turn, where waste would also reduce. However given the relatively strong economic position seen in New Zealand, the demand for Resource Recovery services is likely to return to previous levels as the economy gets better. Waste levels and demand for resource recovery services generally fluctuate in relation to economic growth or down turn.

Demand for Materials

Markets for recyclables and plastics in particular, are fairly limited in New Zealand and overseas markets are subject to significant price fluctuation, an impact highlighted in the international market closures during the covid-19 pandemic. It is hoped that the establishment of more sustainable local markets for recyclables will increasingly reduce the need to export recyclables in future.

Markets for compost produced form the Organics Processing Plant are largely rural commercial, this market may ultimately provide greater security than the urban market, which is already well supplied by competing producers.

Private Sector Competition

Private sector competition generally increases with economic growth. The areas of collection, drop-off, and waste transfer, may remain around their current levels, with commercial waste generally being handled by the private sector, and household and small business waste generally being handled by the Council.

Other private services seen to currently be having an effect on the Council's Resource Recovery services include:

- Household wheelie-bin private services, although the number of operators has reduced significantly with the introduction of the Council's kerbside wheelie bin collection.
- Private skip services serving both the general public and the commercial sector
- Waste recycling businesses serving the commercial sector.
- A landscaping business opposite the Parkhouse EcoDepot provides a green waste drop-off and composting service, and is now composting all green waste received by Parkhouse EcoDepot.
- A private composting business in the north of the city is now composting all Styx Mill EcoDepot green waste.

Private competition may in future stabilise around current levels, with commercial waste essentially being handled by private services, and household and small business waste continuing to be managed by the Council. Waste Handling licencing might be a way for us to work with private sector to reduce waste and encourage reuse, recycling and composting.

4.1.5 Economic

- Changes in household wealth
- Competing and/or alternate services
- Employment
- Number of businesses
- What waste is being produced and what packaging is used.

4.1.6 Other Influences

Council Policy and Pricing

The 2009 Waste Management Bylaw was adopted with the purpose of preventing contamination of recoverable resources and maximising the recovery of recyclable resources.

The Council pricing for waste disposal influences demand for the different elements of the service.

The Council is encouraging waste minimisation within the community by providing recycling services at the EcoDepots free of charge and disposal of green waste at lower rates than general waste. Any changes in the charging structure for recycling and waste disposal affect community behaviour.

Fees for residual waste are expected to continue to increase at a faster rate than inflation, driven by reducing residual waste quantities and the Council's commitment to full cost pricing for disposal. Significant increases in the waste levy, including a staged increase to $60 tonne recently notified by central government will also impact incentives for diversion. Charges for kerbside bin options are based on rates contained in the contract, and should increase at around the rate of inflation.

Legislation and Waste Management Planning

Any new legislation will have the potential to impact demand for waste management services. An example of this would be changes to the Emissions Trading Scheme, and /or the development of a national cleanfill standard as these could have a key impact on the types and quantity of waste disposed to landfill.

Proposed legislation on a national container return scheme has further potential to influence the availability of recyclables.

Public Education

The effectiveness of The Council's waste minimisation education programme will affect the actual and relative volumes of waste seen in each stream (recyclables -v- residual waste). These education programmes are adjusted to keep pace with changing community expectations and target areas where residual waste is higher than target.

Efficiency and Product Stewardship

The NZ Waste Strategy (2010) states, "More efficient use of materials will have the biggest long-term impact on waste reduction. Greater efficiency will not only reduce material use but offer more re-use and recycling options".

The Waste Minimisation Act 2008 (WMA 2008) provides a framework for product stewardship to reduce waste from products and to encourage producers to take responsibility for the environmental impacts of their products. Unfortunately, greater material efficiency in the manufacture of goods, including longer life products with recycled content that are reusable, repairable, and ultimately fully recyclable, is often not in the economic interests of manufacturers, importers, or retailers. It also often flies in the face of traditional consumerism which supports economic growth through rapid turn-over of goods. A stronger regulatory approach by government is considered likely in future, although possibly not in the short term.

The future implications of product stewardship for the Council are uncertain; it will be dependent on the Council's levels of voluntary and statutory involvements.

Environmental Issues

Climate Change

Gas recovery from the Burwood Landfill has been undertaken since 2003 to lower greenhouse gas emissions. This activity is likely to continue until around 2025 dependent upon landfill gas recovery levels.

The impacts of GHG emissions from our collections fleet and processing facilities also needs to be considered, as does the vulnerability of our facilities and closed landfills to changes in sea level and associated coastal impacts.

Resource Consent Requirements

Resource consent requirements may lead to some upgrading of odour control at the OPP. Closed landfill monitoring has the potential to lead to major environmental protection works.

Hazardous and Special Waste Management

The management of hazardous and special wastes may be a growth area for the Council, possibly having some new service and asset implications.

4.1.7 Impact of Demand Drivers

Demand Driver	Impact on services
Inner city kerbside collection	Selection of appropriate infrastructure technology and new collection contracts to service an updated service model
Changing recyclables markets	Changes in collection and processing of materials, pre-treatment and adding value to outputs, onshore processing and alternative technologies. Volatility in international markets for recyclables has severely disrupted past options, and impacted on resource recovery. The ability to process recyclables safely disappeared in March 2020 with Covid-19 restrictions, resulting in the need to temporarily landfill these.
Residual disposal opportunities	Alternatives to waste to landfill, changes in collection systems to accommodate any shifts in disposal technology
Changes in National Policy, e.g. Waste levy, product stewardship and container return scheme proposed	Return on commodities, collection systems and costs of landfill all impact current service viability

Table 4-4: Potential impact of demand drivers on services

4.2 Demand Forecasts

4.2.1 Historic Demand Changes

Since implementation of the kerbside three bin system, Council has provided all residential properties with a standard set of containers for the collection of their waste. The demand for the kerbside service has predictably fluctuated with population changes, e.g. increasing steadily over time, then decreasing after the 2010/11 seismic events, and since then steadily increased.

4.2.2 Forecast Future Demand

Projected demand is affected by a number of different influences as discussed in the preceding section. However, population shifts is seen as the primary contributor.

Predicted capacity required to meet future demand is addressed in existing contracts for infrastructure based services including transfer stations, the organics processing plant, the materials recovery facility, kerbside collection trucks, wheelie bins and Kate Valley landfill.

Most of the previously forecast demand will, therefore, be met by continuing to manage existing long-term contracts for infrastructure provision, as well as funding of support services for business and industry through Target Sustainability services, and raising awareness/education projects for the wider community.

The demand for the services provided by the Resource Recovery assets are discussed below by asset class.

Kerbside Collection

The kerbside collection contractor is responsible for ensuring the on-going supply of new kerbside bins, repairs and sufficient kerbside collection vehicles to incorporate household growth, with the cost being built into the contract rates for bin collection.

The kerbside collection contractor is responsible for meeting possible future increasing demand at Community Collection Points, at no additional cost to the Council.

Kerbside Recyclables

The quantity of Christchurch recyclables received at the Materials Recovery Facility (MRF) may continue to increase for some years to come due to:

- total waste generation per resident continuing to increase
- population increase
- increasing utilisation of the kerbside recyclables collection service over time

In the longer term it is hoped that increasing material efficiency and more sustainable living by the community will reverse the trend and will be accompanied with a continued decline in residual waste volumes.

Kerbside Organics

Long term, the total amount of kerbside organics collected is expected to increase in time with household growth. Community demand for a larger standard green bin is expected to grow over time.

Residual Waste

The quantity of kerbside rubbish in the longer term is expected to reduce with increased utilisation of the kerbside recyclables and organic services.

Transfer Stations

Waste compaction received at EcoDrops has started trending downwards (about 10 thousand tonne per year), however kerbside rubbish is staying about the same with a small increase the last three years. We are working on future waste reduction options for total household and small business waste handled by the Council's services.

The Parkhouse and Metro EcoDrop has seen an increase in number of customers utilising this site due to the planned urban development and settlement re-distribution patterns post-earthquake, both of these sites have major growth areas planned in their catchments. There is also small developments taking place around the Styx Mill area.

The three EcoDrops have capacity in all areas to cope with expected future demand for the current range of services provided at least up to 2024. Beyond 2024 we are planning to improve the site layout of Parkhouse to make the facility more efficient and create a better flow for the growing demand.

Any upgrading or new assets required for future new or expanded services at EcoDrops, e.g. further extension of Recycling Centres to accommodate an increased range of materials accepted, would be the Council's responsibility.

Banks Peninsula Assets

- Continual future options to expand recyclable items collected at the Banks Peninsula transfer stations is an on-going process.
- No capital investment by the Council on Community Collection Points (CCPs) is expected to be required over the term of the Kerbside Collection Contract. The ongoing provision of CCPs is the contractor's responsibility and is an operational cost to The Council.
- Any upgrading or new assets required for future additional or new services at Banks Peninsula recycling collection stations, e.g. the construction of additional storage to accommodate an increased range of materials accepted at the Barrys Bay transfer station, would be the Council's responsibility. Managing possible future increasing demand for scrap metal, reusable items, and green waste, is the contractor's responsibility.
- The Barrys Bay Banks Peninsula transfer station is expected to have sufficient capacity in all areas to cope with expected future demand for the range of services currently provided.

EcoSort Materials Recovery Facility (MRF)

The quantity of Christchurch recyclables received at the MRF may continue to increase for some years to come, due to:

- population increase.
- total waste generation per resident continuing to increase.
- increasing utilisation of the kerbside recyclables collection service over time.

In the longer term it is expected that more sustainable living by the community will stabilise the trend.

The capacity at the EcoSort facility has been designed to incorporate growth with markets being sought for recycling. The contract ensures that the MRF contractor is responsible to ensure the plant continues to provide sufficient processing capacity including allowances for seasonal changes and increases in material tonnages as required. Increases in demand are able to be managed through additional staffing and additional plant running hours up to the design capacity. Improvements in technology and equipment over the course of the contract will allow for a greater processing capacity.

Organics Processing

Original design demand was expected to increase from 65,171 tonnes per year in Year 1 (2009) to 74,646 in Year 15 (2024). These calculations included both kerbside collection and riverweed. These projections were based on an assumed 0.5% growth rate in population and 0.5% growth in usage from behavioural change. An assumed rate of contamination of 2.5% was included.

Projected demand has fluctuated throughout the lifespan of the OPP. It has been influenced by the 2010/2011 Canterbury earthquake sequence, population change and bin utilisation. The facility is currently being upgraded to remove all outside maturation and screening of compost as well as ensure it has sufficient capacity for any potential growth. As part of these redevelopment works, demand growth will be calculated beyond the end of the current contract (2024). Key dates to model to are:

- 2033 - When the resource consent for the facility expires, and
- 2045 - When the aeration system will likely need a complete renewal.

Burwood Resource Recovery Park and Landfill

There are no known issues with the future capacity of Burwood Resource Recovery Park and landfill. The facility has a definite life and is consented to operate until 31 March 2021 and to be rehabilitated by 31 December 2021. Acceptance of construction and demolition waste ceased on 20 December 2019. Contaminated soils will still be accepted until 31 March 2021.

Burwood Landfill Gas Recovery Scheme

The production of gas by the existing scheme is diminishing over time. There are no other closed landfills that are likely to produce gas in quantities that are economic to extract. Five new Landfill Gas wells were installed in March 2020. The wells were connected to the gas gathering network in May 2020. Over the next six years gas flows will be monitored and as required additional new wells and gas gathering pipelines will be installed to maintain steady production levels. Currently there is space to drill an additional 16 new landfill gas wells.

Closed Landfill Aftercare

Re-activation of the Burwood landfill has resulted in additional landfill aftercare requirements however these will be the responsibility of Burwood Resource Recovery Limited. The terms of the agreement require that the site be restored to the pre-earthquake situation, and that fencing and any other infrastructure used for the BRRP be removed from the site by the end of the operation, unless agreed by CCC to remain. Following completion of BRRP's waste disposal services by 31 December 2020 the site will be restored before 31 December 2021. Restoration includes dismantling the processing, and sorting plant which was completed in June 2020. Any disturbed areas will be restored as per the terms in the CCC agreement[5]. Closed landfills adjacent to bodies of water, or prone to erosion by storm events are being addressed in regard to climate change and sea level rise issues.
Following the completion of planned rehabilitation work at Burwood Landfill, the need for landfill aftercare may reduce to on-going monitoring and maintenance at a number of closed landfills, assuming there are no surprises from future monitoring.

4.3 Impact of Changing Demand on Existing Assets

Future Demand on Assets

Any change in demand will impact on the level of service and condition of each solid asset involved, potentially leading to differing maintenance requirements and/or the need for non-asset solutions.

Some of the impacts of future demand on assets have been described in the preceding section. The following discussion provides further analysis of the effects of future demand on assets.

[5] **PDP (July 2012) Assessment of Environmental Effects for the Burwood Resource Recovery Park.**

- **Recovery and disposal, Waste Compaction, Transfer, and Disposal, and recovery**
  Container Parks owned by the Council at the Metro and Styx Mill EcoDrops, have ample existing capacity and are not expected to require any future upgrading.
- **Recyclables Processing and Ecoshop**

  Future upgrading of the MRF to enable sorting of higher grade product, if needed, will be funded by the operator at no cost to the Council.

  Future expansion of the EcoShop may be warranted in the medium term, but this may not involve any expenditure by the Council as this will be funded by the operator at no cost to the Council.

- **Organics Processing Plant**

  To meet predicted increased demand, it was originally planned to add three more tunnels to the Organics Processing Plant (OPP) in 2013/14 and 2014/15 which would have provided an additional 17% capacity. With the consented change in process, additional capacity can be catered for within the current plant and the need for additional capital expenditure originally planned for 2012/13 to 2014/15 in the 2009-2019 LTP being deferred.

  In November 2020 Council approved further investment in the facility to address odours issues in the local community, setting aside $21.7 million to upgrade the existing tunnels and enclose the maturation and screening stages of the process. These changes will also increase processing capacity at the facility with changes to be confirmed upon award of the design and build contract.

  The OPP's Asset Management Plan shows commitment to regularly evaluate the capacity by stating that "A Demand forecast will be updated annually to reflect changing circumstances".

- **Burwood Landfill Gas Recovery Scheme**

  No further extension of the Burwood Landfill Gas Recovery Scheme customer supply network is currently planned. See Section 4.2 above. Gas supply will dwindle as time passes so some current users will need to find alternative fuels.

- **Landfill Aftercare**

  Capital expenditure for landfill aftercare is as forecast in the 2018– 2028 Long Term Plan. This work is funded through the Landfill Aftercare Provision, with additional funding, including $1.5m for Bexley landfill, approved on a case by case basis. Closed landfills adjacent to bodies of water are being addressed in regard to climate change and sea level rise issues.

Asset Utilisation

Asset utilisation will generally increase as a result of the above demand forecasts. The asset utilisation is expected to remain within the LoS targets.

Any change in demand could have an impact on the level of service and condition of each asset involved, potentially leading to differing maintenance requirements and/or the need for non-asset solutions.

Asset utilisation will need to be monitored effectively so that trends, issues and solutions can be identified to respond to demand changes.

4.4 Demand Management Plan

Demand for Resource Recovery includes access to suitable facilities (e.g. public transfer stations and waste processing infrastructure) and services (e.g. kerbside collection services and community collection points).

Demand for new services will be managed through a combination of managing existing assets, upgrading of assets, providing new assets to meet demand management. Demand management practices include non-asset solutions, insuring against risks and managing failures.

Demand management initiatives may increase or decrease the demand for a Council service. This could have an impact on the need for assets and their management. Demand management are activities that are undertaken by the activity provider (Council) to alter demand. It is not related to external factors that influence demand – these are the demand drivers, discussed earlier in Section 4.1.

In many instances demand management is understood as trying to limit the need for a service. However, demand for a service can also be increased by initiatives undertaken.

Non-asset solutions focus on providing the required service without the need for the organisation to own the assets and management actions including altering demand for the service, altering the level of service (allowing some assets to deteriorate beyond current service levels) or educating customers to accept appropriate asset failures.

Non-Asset Solutions

The Council has developed programmes to manage demand as required by the Waste Minimisation Act 2008. These programmes are based on the waste hierarchy:

- Reduce
- Reuse
- Recycle
- Recovery
- Treatment
- Disposal

These programmes are part of Council's Demand Management Plan (sometimes also called non-asset solutions) seek to modify customer demands for services in order to:

- Optimise utilisation/performance of existing assets.
- Reduce or defer the need for new assets.
- Meet the organisation's strategic objectives (including social, environmental and political).
- Deliver a more sustainable service.
- Respond to customer needs.

Waste Management and Minimisation Plan 2020

Demand for waste and resource recovery services is addressed in council's long term waste strategy, which is formalised via the statutory requirement to produce a Waste Management and Minimisation Plan, the latest Plan was finalised by Council in 2020, and includes the following Vision, Goals and Objectives:

Vision - Ōtautahi-Christchurch is a sustainable city, working towards zero waste and a circular economy.

Goals -

- Everyone has access to recycling, resource recovery and waste management services.
- Organisations and individuals understand that reducing and minimising waste is their responsibility, as well as ours.
- Valuable resources are reused or recycled and don't go to landfill.

Objectives -

1. 1. Collaborate with Papatipu Rūnanga, organisations, industry operators and Central Government, to support a regional and national transition to zero waste and a circular economy.
2. 2. Make sure our waste management facilities and services maximise resource recovery and avoid adverse effects to people and the environment.
3. 3. Reduce our reliance on overseas markets for recyclable materials.
4. 4. Make sure our waste, recycling and organics facilities support our climate change targets. Our targets are zero net greenhouse gas emissions, and to halve the 2016 baseline for methane, by 2045.
5. 5. Make sure our kerbside recycling and organics collection has low contamination levels, allowing for sorting of products, which are then suitable for processing or sale. This creates long-term economic benefits.

4.5 Growth Related Projects and Programmes

Waste minimisation and education

The Council's waste minimisation initiatives to date have focussed strongly on diverting waste from landfill, through reuse/recycling/composting of waste collected at the kerbside and dropped off at CCC transfer stations. Minimising the commercial waste stream is the focus of the Target Sustainability team. Reduction is recognised as being the most resource efficient and sustainable approach towards waste minimisation, while the commercial waste stream accounts for more than half of total waste sent to landfill. Current expenditure on resource recovery education and minimising commercial waste is estimated to be less than 2% of total operational expenditure, and includes the following activities:

- Educational material on reduction contained on the Council website and included in its 'Learning through Action' programmes.
- Participation in regional waste reduction initiatives through the Canterbury Waste Joint Committee.
- Waste minimisation advice and assistance delivered to businesses/organisations/institutions through Target Sustainability.
- The Council uses media advertising in their waste minimisation activities. TV advertising is considered necessary for impact, community reach, and influence. Other media advertising e.g. newsprint, radio, billboards, and buses would support the TV advertising.
- The rise of social media and educational online video material are important additional methods of communicating with large sections of the community. Implementing an on-going 'mass social marketing campaign', designed to get residents and businesses to take responsibility for minimising both their waste generation and residual waste, could help Council meet its waste minimisation targets.

Asset creation and acquisition

The new assets and improvements to existing assets required to meet growth are defined in section 7. With major assets owned by or on council owned land (including the Materials Recovery Facility) returning to Council at end of Contract term or becoming available (e.g. Wheelie bins owned by the collections contractor can be acquired at a rate of $0.01 upon contract completion).

The development and acquisition of new assets will commit the Council to fund ongoing operations, maintenance and renewal costs for the life of the asset. These future costs needs consideration in developing forecasts of future operations, maintenance and renewal costs. OPEX costs have been capped over recent years and have not been adjusted for new assets resulting in some new or existing assets not being adequately maintained. Adjustment of annual OPEX budget is required to cover existing shortfalls, and an annualised increase for maintenance for new assets must be provided to meet the demands of growth.

Key Projects include;

- Upgrades of our Organics Processing Plant
- Enhanced optical sorting at our Materials Recovery Facility
- Transfer Station renewals and plant upgrades
- Landfill Aftercare and management of former landfill sites

5 Managing Risk and Investing in Resilience

This section outlines Council's approach to managing risk and investing in resilience. It includes responses by the activity to build resilience across a number of identified 'disruptors'. A risk register and schedule of proposed risk mitigation actions are also included.

5.1 Council's Approach

Investing in Resilience

The Resilience Greater Christchurch Plan (RGCP) provides a framework and multi-agency actions towards a more resilience City. All Council's activities play a role in contributing to this Plan by becoming more resilient to 'disruptors'.

To build resilience in our asset networks, we need to firstly understand the potential disruptors and the impacts on our assets and services. These are outlined in Section 5.2.1.

Key projects or activities to improve resilience, that we have identified and defined sufficiently to be included in this AMP programme, are included in Section 5.2.2.

Where further investigation is required to understand the impacts of disruptors and ways to be more resilient, opportunities are identified in Section 5.2.3.

Risk Management

Council's corporate approach to managing risk is defined in its Risk Policy and assessment framework. The framework provides a means for consistently identifying, recording and assessing risks such that risk mitigations can be prioritised across Council. The risk management framework and application to AMPs is summarised in Section 4.3.3 of the SAMP.

Whilst the resilience programme focusses on the big, strategic challenges such as natural hazards and globalisation, Council's risk register (recorded in ProMapp) is also intended to be used to manage higher frequency, lower probability events. For example, while another major earthquake would have very high consequences for many of Council assets, lower consequence risks such as third-party damage may be so frequent as to also warrant attention.

In Section 5.3.1 we provide a snapshot of the highest risks recorded for this activity and in 5.3.2 summarise the major mitigation actions that have been included in this AMP.

Resilience Definitions

Acute Shocks: Sudden, sharp events that threaten us e.g. the Canterbury earthquakes represent one of the most significant types of shock any place can endure.

Chronic stresses: Activity that weakens the fabric and functioning of a city on a day-to-day or cyclical basis.

Resilience is the capacity of individuals, communities, businesses, and systems to survive, adapt and grow, no matter what chronic stresses and acute shocks they experience. (100 Resilient Cities)

The Resilience Dividend: The practice of designing projects and policies to address multiple challenges at one time, improving services and/or saving resources i.e. the net social, economic and physical benefits achieved when designing initiatives and projects. (*100 Resilient Cities)*.

Multiple Dividends accrue from investment in disaster risk reduction and can: (1) Avoid or minimise losses when disasters strike. (2) Stimulate economic activity in a zone as a result of reduced disaster risk; and (3) develop co-benefits, or uses, of a specific investment.

Absorption is the ability to absorb shocks or stresses without triggering non-linear, abrupt environmental change (in the wider sense of 'environment' not just the natural environment). *New Zealand Treasury Resilience and Future Wellbeing 2018.*

Adaptation changing something in order to make it suitable for a new use or situation. In a climate change context, the UN Development Program calls it a process by which strategies to moderate, cope with and take advantage of the consequences of climatic events are enhanced, developed, and implemented. *(Oxford Dictionary).*

Mitigation is the action of reducing or minimising the severity and seriousness of any harmful impact *(Oxford Dictionary).*

Resilient Qualities are the characteristics of resilient projects and systems. The 100 Resilient Cities define these characteristics as reflective, resourceful, robust, redundant, flexible, inclusive, and integrated.

5.2 Investing in Resilience

5.2.1 Understanding our Resilience Challenges

Section 4.3 of the SAMP detailed the 'shocks and stresses' (disruptors) that provide resilience challenges for Christchurch.

Key disruptors considered here include the impacts of climate change, globalisation and shocks associated with major natural hazards. Table xx summarises how each of these disruptions has the potential to negatively impact our assets and services:

	Disruptors	Potential Impacts on our Assets and Services
Chronic Stressors	Climate Change	Sea level rise impacting former and closed low-lying landfills. Increased risk of erosion and containment failure, exposing landfill materials which may impact ecological receptors, contaminating land and waterways. Ability to meet Carbon neutral targets for 2030 – Current reliance on fossil fuels across collection and transport infrastructure for Resource Recovery (diesel fleet).
	Globalisation	Market volatility for international recyclable commodities – impacts of foreign policy on recycling markets (e.g. China National Sword) have identified the risks related to our reliance on international reprocessing of recyclables. Lack of onshore reprocessing capacity could require landfilling of materials.
Acute Shocks	Seismicity	Access to Kate Valley (regional landfill) – a major natural event could disrupt access to landfill, reliance on a single point of disposal for the City's putrescible and hazardous waste would be a significant issue. Subsidiary effects of a seismic event would include: Impacts on closed landfills, transfer stations, materials recycling plant, organics processing plant, transport routes for kerbside collection services. To manage these impacts (e.g. Influx of debris and construction and demolition wastes), council is looking at existing Disaster Waste Management Planning processes, including provision of sufficient response, disposal processes and sites.
	Tsunami	Impact on low lying closed landfills and possibly Burwood closed landfill; transport routes for kerbside collection. Influx of debris, contaminated materials.
	Flooding	Transport routes for kerbside collection; operations at transfer stations, materials recycling plant, organics processing plant. Influx of debris, contaminated materials.

Table 5-1: Potential Impacts of Resilience Disruptors

5.2.2 Resilient Projects or Activities in this Plan

The following projects and programmes to build the resilience of our assets are already underway and/or are included in this AMP programme. These projects will position Christchurch to be better prepared for, and more resilient to, the disruptions identified in the Resilient Greater Christchurch Plan as most likely to impact on community wellbeing.

Former and closed landfills:

Project Description	Council are aware of 131 closed landfills within Christchurch City and Banks Peninsula, Council have developed a risk screening tool to assess the potential impacts across these sites with a number of remediation projects identified.
Scope and Expected Impact	• Review all known landfills and update risk register and GIS databases • Undertake further investigations to update risk profiles

	• Utilise the prioritisation tool to assign further investigations and remediation works By maintaining an up to date register Council will be able to prioritise critical investment in managing former landfill sites.
The Case for Change	By understanding our resilience challenges and identifying key risks, Council is able to invest in remediation or protection of sites ahead of risks being actualised and significant clean-up costs incurred.
The Resilience Dividend	The dividend would be ability to manage existing sites appropriately, contributing towards maintaining public health and protecting the natural environment.
Further Opportunities	By understanding our risks and resilience challenges Council is better positioned to respond to emerging risks and address program synergies that increase resilience.

Waste/Recycling facilities:

Project Description	Resource Recovery facilities owned by CCC (including Kate Valley where CCC owns 39.8%) are managed externally by long-term contracts. The contracts require appropriate management including planning for contingencies, maintenance and condition upon lapsing of contracts.
Scope and Expected Impact	Each facility has own contractual requirements to support ongoing operation. Financial impacts of site repair and redevelopment covered by Council insurance.
The Case for Change	Risks associated with international changes in recycling markets and the increased costs of waste disposal may result in new methods of collection, processing and disposal. Council needs to remain agile to these changes and adaptive to new approaches.
The Resilience Dividend	The ability to maintain ongoing service delivery and contributing towards maintaining public health
Further Opportunities	Explore alternative approaches and identify benefits to new ways of working.

5.2.3 Building the case for Resilience Investment - 2021 LTP and beyond

Often, we will need to do further work to build a case for future investment in resilience e.g. information/data, policy directions, guidelines, modelling, etc. These opportunities are the basis for a potential investigatory programme of work to inform the 2024 and 2027 LTP's and are summarised below.

Disruptor	Opportunities	Timeframe	Resources
Seismic events, tsunami, flooding	*Develop an updated Disaster Waste Management Plan. Upon future rebuilds improved resilience will be incorporated*	*10 – 20 years*	*None*
Climate change	*Assess risk associated with a changing climate, including sea level rise and impacts on historic landfill processes. Ensure existing sites are maintained and managed in a way that the impacts of sea*	*Ongoing*	*$TBD*

	level rise will not create further hazard.		
Globalisation	*Develop onshore reprocessing options (including alternative technologies), to manage the waste materials we create - inorder to minimise the impacts of Global price volatility on our costs of disposal and to create a sustainable circular economy.*	*2024*	*$TBD*

Table 5-2: Opportunities to Improve Resilience

5.3 Managing Risks

Council's approach to managing risk is detailed in its Risk Management Policy (including a risk assessment framework) which is summarised in Section 4.3 of the SAMP as a background to the content in this Section.

5.3.1 Strategic Risks

Business unit leads have the responsibility for identifying, recording and monitoring business risks using 'Promapp' that are rated as high or very high. The reporting within Promapp ensures that there is visibility of the risks Council is managing. The Council risk framework sets out the levels at which residual risks are escalated, reported and governed.

The strategic risks in relation to this activity include:

Description of Risk	Risk Rating
Recycling commodities price volatility, reliance on international markets and lack of onshore alternatives.	Very High
Health and Safety across all Resource Recovery operations	Medium
Natural Hazard – major disruptive event	Medium
Former and Closed Landfills (Containment and management)	Medium

Strategic risks include a mixture of asset and non-asset risks, for non- asset risks operational risks are managed through Council contracts with agreed procedures and safe work practices. External non-asset risks, e.g. access to international markets for recycling are managed broadly through close liaison with our stakeholders including materials reprocessors, Central Government and industry.

Key resilience challenges faced by the Resource Recovery activity include:

a) changes in global markets affecting the viability of recycling services;

b) excessive, wasteful consumption and new composite products overwhelming our ability to recycle or compost;

c) higher disposal costs impacting on illegal dumping; and

d) natural hazards such as floods, sea-level rise or tsunami impacting closed landfills and waste facilities.

Our key responses to these resilience challenges include:

a) advocating for product stewardship schemes where the manufacturers take responsibility for their products or simply products so they can more easily be recycled or composted;

b) finding local uses for the materials recovered from the waste stream;

c) community and business education and behaviour change so we more successfully implement circular economy approaches and reduce wasteful consumption;

d) asset management to ensure waste infrastructure remain resilient to natural hazards.

The benefits of adopting these approaches include a more vibrant, sustainable and resilient local economy with new job opportunities, local manufacturing, greater self-reliance and less demand on our natural and physical resources.

5.3.2 Asset Risks

A large proportion of the risks identified in the risk register are associated with operation of facilities. These risks are managed by each of the contractors providing that service by employing best practice techniques, following operational plans and ensuring compliance with legislation and resource consent conditions. All Resource Recovery assets have individual contracts and asset management plans.

Contractors are required to maintain their own risk registers and plans which include emergency, incident, business continuity and health and safety plans. The Council will maintain an overview of risk for delivery of the waste minimisation and disposal service.

Disruptions to the kerbside collection services caused by a natural hazard or emergency event pose risks to the community and have been identified in the risk analysis. Location and population effects of the different natural hazards have been identified as part of the Disaster Resilience Plan. Actions to reduce these risks should be identified by the contractors assisted by the Council. Post-earthquake, Resource Recovery collection was resumed as a high priority and included collection of human waste due to failure of the wastewater network.

Disruption to the EcoDrop and Organics Processing Plant has been identified as a high priority in the risk analysis. Alternative dump sites for each facility have been identified during the recent earthquakes and the city has demonstrated the ability to put in place appropriate Disaster Resilience Plans. This risk has also been recognised in the OPP Loss Prevention and Recovery Plan. A disaster recovery plan for disaster relief and prompt resumption of services has been developed which includes provision of 3 days on-site storage for delivered organics supplemented with off-site storage.

The Council has identified interdependency issues between Resource Recovery and other utilities. Failure of a single utility has potential to cause knock-on impacts to others. The Resource Recovery service has been identified as being heavily dependent on fuel supply and communications. Mitigation actions to limit the impact of these dependencies include fuel tanks at a number of Council sites and back up radios.

A Disaster Resilience Plan for Resource Recovery in Christchurch, complying with the CDEM Act 2008 has been prepared to assist the Council, its Emergency Manager and Civil Defence Emergency Management (CDEM) Group to prepare and respond to adverse events. The Plan outlines the expected impact of a number of hazard events on the assets and service delivery for Resource Recovery. The Plan outlines how the Resource Recovery service will be delivered during and after emergencies including response arrangements and plans for alternative waste storage.

There are risks associated with customer and community behaviour, including illegal dumping. These risks may be linked to increasing transfer station fees or changes to the Council's policies but this is currently only supposition. These risks are managed by:

- Improving public knowledge through public education programmes
- Ensuring response procedures are in place
- Monitoring the level of reported incidents.

ID		Risk Description	Inherent rating	Treatments in place (today)	Residual impact	Residual likelihood	Residual rating	Proposed additional treatments
	Major Infrastructure Failure	*There is a risk that the organics processing plant, EcoSort, transfer stations, Banks Peninsula Community Drop offs, MRF, Kate Valley, and the Canterbury Regional Landfill could fail, or access to one or multiple sites could be restricted. While unlikely, this would significantly impact Christhurch's Resource Recovery services with no alternative disposal sites necessarily available. In addition road access could be impacted and has the potential to stop/disrupt/affect transport route to Kate Valley, and kerbside collection services.*	*High*	*Sites managed under Contract with specific requirements for the asset maintenance and operational contingencies*	*Possible*	*Major*	*high*	*Develop Christchurch's Disaster Waste Management Plan and work with Civil Defence and Lifelines to understand potential alternatives.*
	Susceptibility of former and closed landfills to natural hazards.	*Risks associated with the management and mitigation of former and closed landfills in relation to natural hazards include containment and capping of sites and the impacts related to erosion and release of landfill materials into the environment. A further risk is the potential inundation of low lying coastal sites due to seal level rise. This has the potential to cause leakage of unknown contaminants into rivers and the estuary/ocean.*	*High*	*Risk screening tool and ongoing landfill aftercare and monitoring program*	*Possible*	*Possible*	*Medium*	*Ongoing review of at risk sites and investment in management of former sites including remediation as required.*
	Fire at key infrastructure	*Potential of MRF and others buildings catching fire, and being destroyed.*	*High*	*Fire sprinkler systems in place and serviced a required.*	*Possible*	*Possible*	*Low*	

Table 5-3: High and very high inherent risk items

Climate Change risk assessments

The potential impact to Resource Recovery activities of a changing climate include;

- Inundation and storm scour of low lying and coastal landfill sites
- Access to facilities
- Flooding impacts (including disruption of services and damage to Council)

The Susceptibility of former and closed landfills to natural hazards (including climate change effects) are considered to hold a high inherent risk, this occurs as the historic process of placing landfills in low lying and marginal land, including as land reclamation make these sites vulnerable to flooding, storm surge and coastal erosion – all closely linked to climate change effects. In 2016 Council developed a risk screening tool for its former landfill sites. The tool includes human health and environmental impacts in a risk scoring mechanism used to identify at risk sites. Council maintain a landfill aftercare program which includes monitoring and remediation of at risk sites.

Current projects include;

- Protection of the former Bexley landfill (installation of rock barrier)
- Removal of the former Le Bons landfill and site remediation
- Closure of the Burwood Resource Recovery Park, including final capping and landscaping

Detailed 2020 Built Environment Domain assessments for Resource Recovery related assets in the City area and Banks Peninsula area have been provided in section 7, and are located at Trim: 20/329241.

Potential climate change impacts on transfer stations and processing facilities as well as closed landfills were assessed for coastal hazards, flooding and landslides in terms of the following criteria – Level of Exposure and Vulnerability. Adaptive responses and wider potential impacts are also covered.

(Note: CCC has a 38.9 % ownership share of Kate Valley Landfill in the Hurunui District, via its shareholding in Transwaste Canterbury Ltd, Transwaste has responsibility for all aspects of risk management of the facility).

5.3.3 Risk Mitigation Strategies

Risk management is inherent in all of Council's asset management processes. Significant risk management strategies for this activity are managed under contract through separate facility asset management plans not replicated here.

Closed and former landfill sites remain a high level risk for this activity. Site specific risks are managed through a risk prioritisation process, with climate change related risks and human health risks identified and managed on a case by case basis. The activity has an ongoing management and monitoring program with major remediation projects developed as required.

5.4 Summary of Risk and Resilience Projects

See Section 7.4.4 for current CPMS data.

The following risk and resilience improvement projects or activities are included in the AMP programme and budgets.

All other Risk and resilience improvement projects or activities are included in the separate external facilities AMP programmes and budgets.

Risk Category	**Improvement or Mitigation**	**2021-2024 LTP Cost Period**	**2024-2054 LTP Cost Period**	**Cost beyond 2054 LTP Period**
Climate Change	*Provide additional resourcing to manage any sites identified through the landfill risk screening process. Update the landfill risk screening programme, include an annual amount for ongoing investigations.*	***$4m***	***$16m***	***Not defined***
Globalisation	*Investigate and develop alternative local treatment processes for recycling materials.*	***None***	***None***	***None***

6 How we Deliver our Services

This section explains how Council delivers the activity through its organisational structure, contracting partners and other agencies involved in service delivery. The

6.1 Historical Context

Council waste services have changed over time as the way we deal with our waste has changed. The shift towards waste diversion and development in 2005 of a single regional landfill (Kate Valley) has driven the development of waste processing sites including the Materials Recovery Facility (EcoSort) and Organics Processing Plant. Council own the land for each site and the buildings at the Organics Processing Plant however both are operated and maintained under contracts. Waste collection is managed through a service contract, with Council no longer responsible for the bin infrastructure or fleet.

Council's services are therefore largely contracted out with Council focus on service delivery, waste minimisation education and new services.

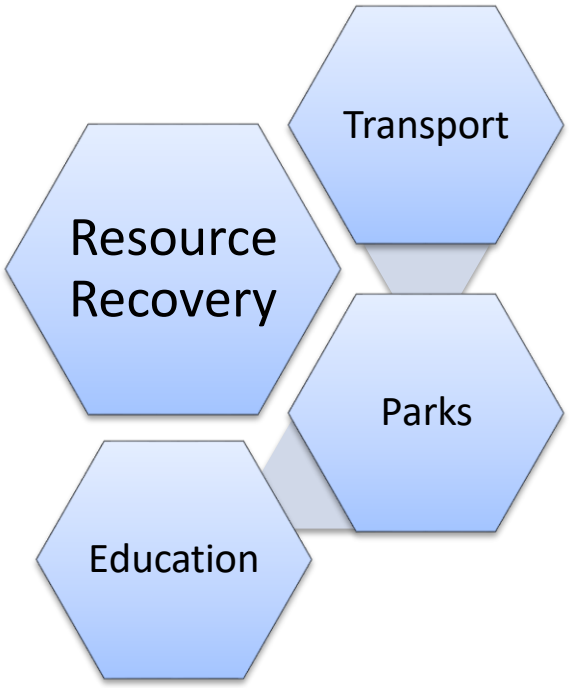
6.2 Internal Business Structure

The main teams within Council with a role in Resource Recovery service delivery is shown below.

Team	Role
Resource Recovery	Managing contracts for kerbside collection, Ecodrops and Bank Peninsular services, Ecosort, Organics Processing Plant and residual waste to landfill.
Transport	Litter, waste and recycling bins
Parks	Education, waste and waste bins
Education (Learning Through Action)	Education

Table 6.1: Team roles

The Resource Recovery Team also interfaces with other departments across Council that support service delivery functions. Primarily this relates to public place bins (waste and recycling), Litter and illegal dumping and education.



6.3 External Contracts and Partners

Council engages a number of specialist contractors to deliver the required Resource Recovery services. The rationale for the current service delivery approach is to appoint expert contractors capable of managing complex resource recovery process and waste services with council staff managing contractor performance.

The main contracts are summarised in Table 6.2 below.

Contract	Type of Service	Contract Length	Contract Period
Waste Management NZ Limited	Operates transfer stations in Banks Peninsula (waste and recycling stations) under contract	15 years + 5 year-term right of extension	1/05/2008 to 31/05/2029
	Operate assets associated with kerbside collection of waste, recyclables and organics	15 years + 5 year-term right of extension	31/01/2009 to 31/01/2029
Waste Management NZ Limited (T/A Living Earth)	Contracted to lease, operate and maintain the facility to 2024 the Organics Processing Plant	15 year contract + 2 year extension - updated in June 2011 to reflect the repair and reinstatement of earthquake damaged assets.	31/01/2009 to 31/01/2024
EcoCentral Limited[1]	Operates Transfer stations including recycling centres in the city (EcoDepots)	10 years + 10 year-term right of renewal.	1/7/2014 to 31/01/2024
	Owns and operates the Materials Recovery Facility and Glass Screening Plants	15 years + 2 year-term right of extension	31/01/2009 to 31/01/2024
	Owns and operates the EcoSort Materials Recovery Facility and other buildings and plant at the Parkhouse Road Recycling Processing Site, Ownership of this facility passes back to CCC in 2024.	15 years + 2 year-term right of extension	31/01/2009 to 31/01/2024
	Operate the EcoShop	15 years + 2 year-term right of extension	31/01/2009 to 31/01/2024
Burwood Resource Recovery Park Limited (BRRP Ltd) owned by Transwaste Canterbury.	Operates the Burwood Resource Recovery Park, closed for new materials as from December 2019.	5 Year Fixed Term Contract	2017 to 2021

Table 6-1: Major Contracts for Service Delivery

6.4 Other Service Delivery Parners

Council provides residential Resource Recovery services across the municipality, with allocation based on rateable units. Commercial waste collection services operate in parallel providing bespoke and complimentary services to large developments and businesses.

Council works closely with Industry to ensure operations are lawful and maintain a waste licensing system to regulate service providers.

The operation of the assets described in the Resource Recovery AMP require some co-ordination with other authorities, in particular the eight other Canterbury territorial local authorities (TLA's) that are co-signatories with CCC of the Canterbury Regional Waste Management Agreement 2000:

Together with the Council the following four district councils, Ashburton, Hurunui, Selwyn and Waimakariri, are co-shareholders in Transwaste Canterbury Limited which is contracted to manage and operate Kate Valley Landfill. Waste Management NZ Ltd is the other shareholder in Transwaste Canterbury Ltd.

Transwaste Canterbury Ltd has contracted out the management of the landfill and the transport of wastes to the landfill to a subsidiary of Waste Management NZ Ltd, Canterbury Waste Services Ltd.

6.5 Significant changes planned for the activity

Nationally, regionally and internationally there has been substantial uncertainty regarding recycling products and markets, and development of the Plan is prepared against that backdrop. High levels of uncertainty complicates overall planning - waste minimisation actions and targets specifically, and therefore necessitates flexibility in planning to respond to constantly the changing circumstances, with accompanying financial constraints on local government specifically.

In 2018 China, the world's largest buyer of recycled commodity products implemented its foreign trade policy (National Sword), which included severe limits on imported recycling and contamination limits. Global markets were significantly affected, with market prices for certain commodities plummeting due to limited alternative markets and a corresponding oversupply of materials. Since implementation China's import restrictions have flowed on to other recycling markets, with a number of other nations restricting the importation standards and volume of materials making it difficult for exporters to guarantee price and acceptance of their commodities in foreign ports, causing significant market uncertainty in those countries of origin.

In Christchurch this has seen a significant drop in the price received for material collected through the kerbside service, which while still less than sending that material to landfill has a significant cost implication to council. Should prices decrease further (costs of recycling increase), Council may need to find alternative reprocessing options or consider the viability of the materials it collects for recycling.

During 2019 the New Zealand Government announced a number of national waste reduction and minimisation initiatives. These include expanded product stewardship and priority products initiatives, proposed container return scheme, and restrictions on certain plastic products, and a review of the landfill levy. The scope and impact of these initiatives have not been finalised at the time of development of this Plan, further emphasising the need for flexibility of approach.

In September 2020 Council approved it's Waste Minimisation and Management Plan 2020, with the vision that Ōtautahi-Christchurch is a sustainable city, working towards zero waste and a circular economy.

The plan provides strategic direction for resource recovery services over the next six years, including five key action areas:

- Maximising composting of organics
- Maximising recycling of recyclable materials
- Safe management of hazardous substances
- Leadership and innovation in the Christchurch waste and resource recovery sector
- Effective resource recovery education and communications

The plan includes a closer working relationship with others, including industry, central government and neighbouring councils to support a shared approach to resolving our waste challenges

Based on the challenges faced in this time of unprecedented market uncertainty, Council has developed its Waste Minimisation and Management Plan 2020, providing strategic direction for our waste and resource recovery services.

Significant changes in international recycling markets and drop in commodity prices means that New Zealand needs to look at onshore and alternative processing options to support waste diversion, where recycling was able to be exported for processing previously, New Zealand now needs to look more closely at the onshore and closed loop solutions for waste and resource recovery.

Council is working with Central Government, industry and other territorial authorities to ensure investment decisions enable a shift towards a circular economy which focusses on the diversion of valuable resources from landfill.

A service delivery review of resource recovery services will also be conducted to ensure it has services in place to meet the needs of our residents and drive waste minimisation. Key inclusions in the Service Delivery Review are;

- As part of the inner city collection review Council will look at charging mechanism and drivers with the goal to implement a more equitable fee structure that encourages waste minimisation.
- With major contracts due to conclude in 2024, Council will commence the formal review process to ensure our delivery model remains appropriate in the changing environment.

7 Portfolio Lifecycle Management Plan

The lifecycle management plans detail how the Council plans to manage the network of assets at the agreed levels of service (defined in Section 3) while optimising life cycle costs.

Section 7 provides the lifecycle management information and strategies at a portfolio level. Section 8 provides this information at an asset class level.

For the Resource Recovery activity, the completion of this AMP is the first detailed Plan produced by the business unit. Due to the majority of assets being managed under contract, asset condition data has historically been held by the contractor, however as a result of the recent asset maturity assessment and the process of compiling this Plan asset condition data will progressively be transferred into Council's possession. Noting that some of the detail will need to be updated as more data becomes available.

7.1 Asset Lifecycle Approach

Council has established a lifecycle management framework, aligned to the *International Infrastructure Management Manual* as illustrated in Figure 7-1. Section 7 and 8 are structured to align to the lifecycle stages.

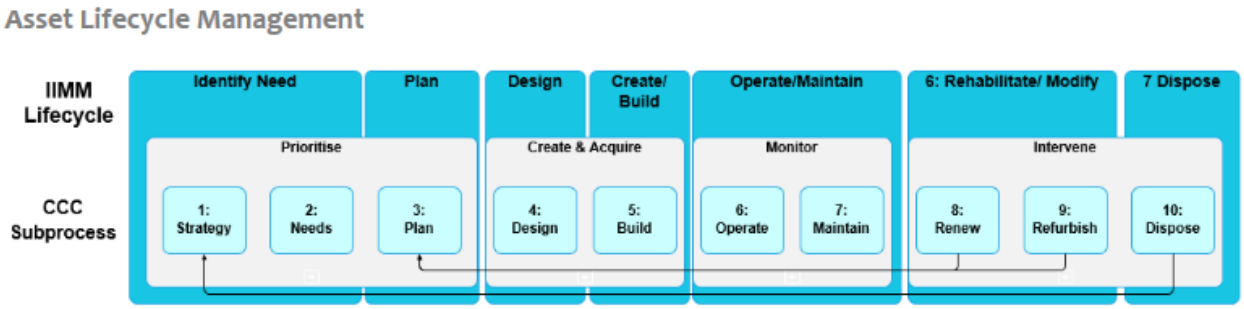


Figure 7-1: Asset Lifecycle Categories

7.2 Our Asset Portfolio

7.2.1 Location and Value

In June 2020, Assets under direct Council Control carried a book value of $11.3 billion dollars. Assets covered under the Resource Recovery Portfolio are largely managed through Operations Contracts, which include individual Asset Management processes and a return of asset at the end of the contract.

For the purposes of this AMP, the Resource Recovery assets are considered as follows;

1. Transfer Stations and Community Collection Points
2. Material Recovery Facility
3. Organic Processing Plant
4. Regional Landfill (Kate Valley) – Not considered under the AMP – Council as a 38.9% shareholder of Transwaste Canterbury Ltd
5. Burwood Landfill – Gas Collection and Treatment Plant
6. Closed Landfills

The value of Council owned assets (excluding land) across the portfolio (at end of contract) is approximately: $41.1 million

Council's Resource Recovery portfolio can be separated into three asset groupings as below:

Asset Group	Quantity	Location	Book Value (Not inc Assets Under Construction) June 2020	% of CCC asset base
Waste Collection				
Banks Peninsula transfer stations	2	Barrys Bay and Birdlings Flat	$42,000	
Community Collection Points	12	*Not accounted for*	-	
EcoDrops/ Transfer stations	3	Styx Mill, Parkhouse, Metro Place	$7,187,000	
Waste Processing				
Material Recovery Facility - Recyclables sorting and sales facilities	1	Parkhouse	$5,184,000	
Organic Processing Plant - Composting Facility	1	Metro Place	$27,414,000	
Management of Closed Landfills				
Burwood gas collection and treatment plant, reticulation and infrastructure.	1	Bottle Lake Forest	$1,229,000	
Landfill gas wells (Note: Landfill gas pipe infrastructure beyond landfill gas treatment plant is an asset under Councils wastewater unit)	37			
Closed landfills (Burwood Kiosk only) No data for closed landfill book value as data excludes land value, (56 closed landfills land value not included)	56	Bottle Lake Forest	$85,000	
Asset portfolio value			$41.1 million	0.004%

Figure 7-2: Asset Portfolio Value

Resource Recovery Asset Locations

Figures 7-2.1 and 7-2.2 show an overview of Resource Recovery asset locations, including; Transfer Station, Organics and Recycling processing sites and closed landfills in Christchurch city and in Banks Peninsula.

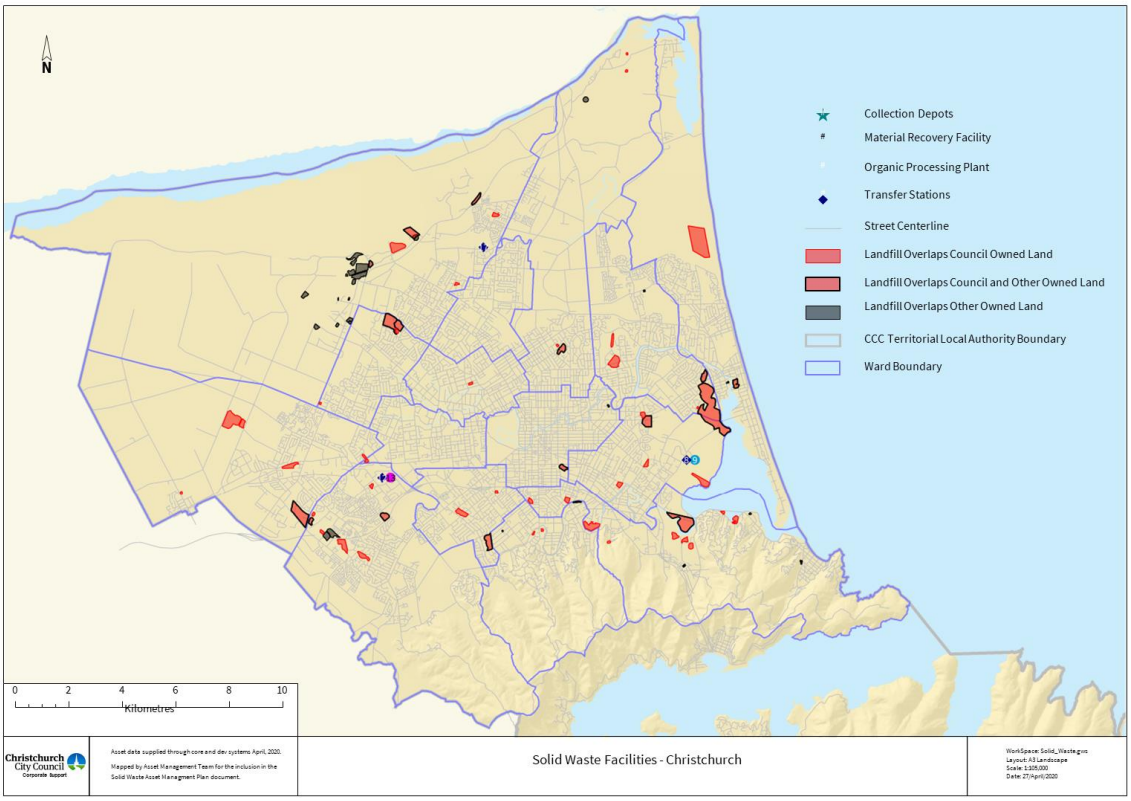


Figure 7-2.1: Christchurch Resource Recovery Asset locations

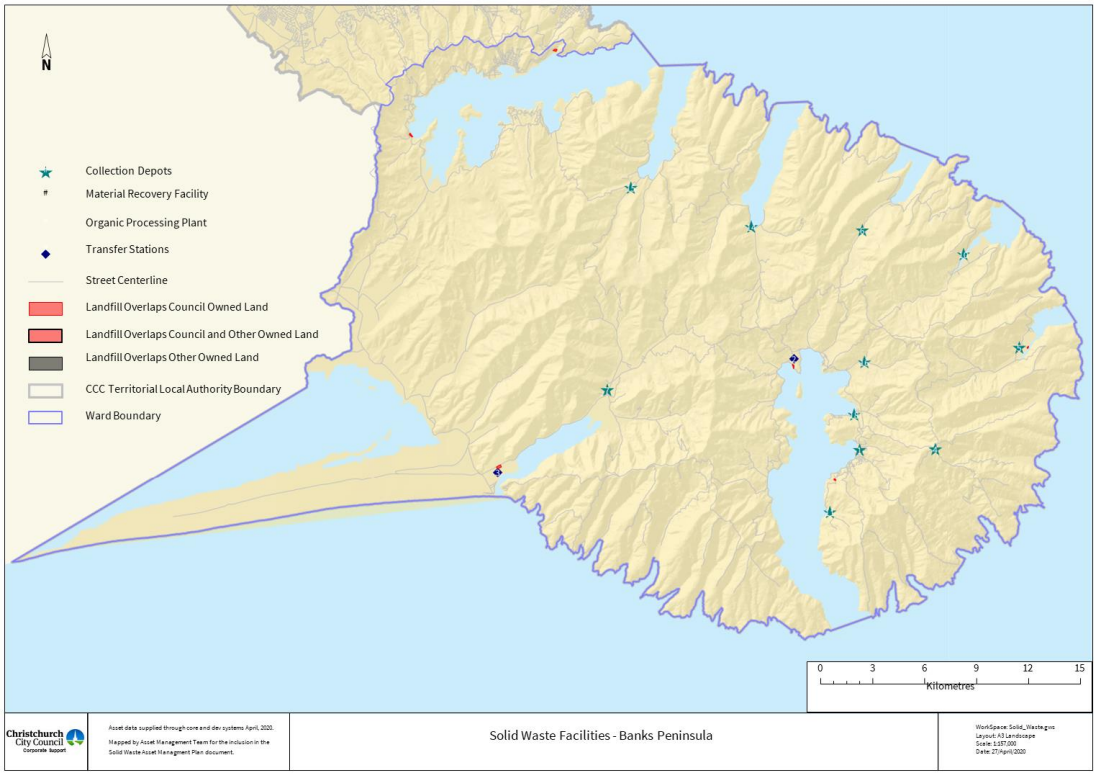


Figure 7-2.2: Banks Peninsular Resource Recovery Asset locations

Kerbside Collection Assets

Approximately 465,000 wheelie bins have been supplied to residents in Christchurch City (excluding the CBD) and settlements of Diamond Harbour, Lyttelton, Port Levy and Akaroa for the three bin kerbside collection service. Wheelie bins for the three bin kerbside collection service as well as the collection trucks are owned by the kerbside collection contractor, Waste Management NZ Ltd. Under the terms of the collection contract, the contractor supplies, maintains and retains ownership of the bins throughout the contract term. Council may purchase these assets at end of the contract term at a rate of $0.01 per container however for this purposes of this document they are excluded from the Asset Register and are not included in this AMP.

Banks Peninsula Assets

The operation and management of the Banks Peninsula facilities and drop-off points is contracted to Waste Management NZ Limited to 30/03/2029. The assets covered are:

- A main waste transfer station at Barrys Bay
- A secondary waste transfer station at Birdlings Flat
- Two recycling depots at Little River and Akaroa
- Community Collection Points (CCPs)
    - Seven CCPs at Le Bons Bay, Okains Bay, Little Akaloa, Pigeon Bay, Little River, Akaroa and Takamatua
    - Three sites comprising rubbish and recycling skips on Council road reserve at Robinsons Bay, Onuku and near The Cab Stand
    - One wheelie bin collection point at Port Levy
    - One pole construction platform at Church Bay for storing and collection of residents' wheelie bins

EcoDrops/Transfer Stations

The purpose of this asset group is to provide recycling and waste diversion services. There are three city refuse stations and recycling centres branded EcoDrops. These are located at:

- Parkhouse Road (Wigram)

- Metro Place (Bromley)
- Styx Mill Road (Redwood)

EcoCentral Limited has a contract to operate the Transfer Stations until January 2024. Under the contract agreements Council is responsible for normal wear and tear of CCC owned buildings and fixed plant.

Features of the Transfer stations are:

- A recycling centre, for the free drop-off of domestic quantities of recyclable, reusable, or household hazardous waste materials, including
- A resource recovery building
- A concrete bin for scrap metal
- A hazardous waste drop-off station
- A waste oil tank (in a shed)
- Bins and containers for recyclables (non CCC assets)
- Sealed drop-off and yard areas
- Concrete bin for hardfill
- Concrete bin for clean soil
- Greenwaste drop off area
- Pit building plus offices
- Fix plant (weighbridges and compactors)

EcoSort Materials Recovery Facility (MRF)

The EcoSort Site is a 1.63 ha industrial site adjoining the Parkhouse EcoDrop. The site has developed since 2000 and is leased to EcoCentral Limited. In 2009 a 4,000 m^2 Materials Recovery Facility (MRF) opened on the site. The MRF was designed and constructed to separate domestic recyclable paper and containers collected in a commingled kerbside wheelie bin collection compacted in the collection vehicles. The MRF building is now owned and operated by EcoCentral Limited. The building will transfer to Council in January 2024 at the end of the 15 year contract period.

EcoSort Council owned assets at the site include:

- A 3 bay 460m^2 warehouse building
- A 3 bay 360m^2 shed
- Other smaller buildings and sheds
- A weighbridge
- Certain site works

The Council has the overall responsibilities over these assets and site works at the EcoSort, Parkhouse Road recycling processing site. The Materials Recovery Facility (MRF) is excluded as this is owned and operated by EcoCentral. Details of the assets and processes used at the MRF can be found in the Asset Management Plan developed for the facility in 2010 (TRIM10/291339).

Council owns a 1.7 ha site between the Parkhouse EcoDrop and EcoSort sites. Canterbury Waste Services Limited leases the site (until 2025) and has constructed and operates a commercial refuse station on the site. Council owned assets are limited to service lines crossing the site. This contract ends 30 June 2025.

The Organics Processing Plant (OPP)

The Organics Processing Plant located at Metro Place contains 18 tunnels for in vessel composting. Assets at the Organics Processing Plant (OPP) were commissioned in March 2009, following the award of a Design, Build and Operation Contract in May 2008. The site, processing green waste in windrows since 1994 and now leased by Waste Management NZ Ltd (WMNZ), included a number of assets which were present before the OPP was constructed. These assets include asphalt concrete hard stands, stormwater drains, concrete pads, fencing and kerb and channel, which now form part of the OPP.

Christchurch City Council owns the fixed assets at the OPP. WMNZ holds a 15 year contract which was updated in June 2011 to reflect the repair and reinstatement of the earthquake damaged tunnels. The contract is due to expire in 2024 (with a potential two year extension).

Organic material is delivered to the OPP by the kerbside collection contractors from Christchurch where domestic collections are undertaken at the kerbside by WMNZ under contract to CCC. Material is also received from commercial customers and via the Eco Drop transfer station next door. The following waste streams are cited in the consent which can be received at the OPP:

- Food waste – including fruit & vegetables, meat, bones and fish, food soiled cardboard, napkins and some pre-approved and pre-sorted uncontaminated compostable event food packaging.
- Green waste – leaves, tree & grass clippings, branches, shrubs, weeds.
- River weed - from Council maintenance contracts

WMNZ has produced a detailed Asset Management Plan for the OPP dated 1 June 2012 (TRIM: 12/467051). This provides further details of the assets and processes used at the OPP.

Burwood Resource Recovery and Burwood Landfill

Burwood Landfill operated from 1984 until 2005 when Kate Valley was commissioned. The Burwood Landfill site was granted consent to re-open in November 2010 for a limited time to manage residual earthquake related demolition waste. Since the February 2011 earthquake, rubble from building demolitions was sent to the old Burwood Landfill and three other smaller areas of the surrounding Bottle Lake Forest, on the authority of the Civil Defence National Controller during the emergency. Without the recovery park, there was the potential for building rubble to be left in the central city, or worse, dumped in paddocks or riverbeds.

Burwood Resource Recovery Park was established, by an Order in Council on 18 July 2011[1], at site B adjacent to the closed landfill site at Burwood in Bottle Lake Forest. Bottle Lake Forest and the Burwood Landfill are owned by the Christchurch City Council, and operated by Burwood Resource Recovery Park Limited (BRRP). The Order allows for the storage, sorting, and processing (including recycling) of earthquake waste. Operations were due to cease in September 2017. However, the pace of demolition work in Christchurch was slower than anticipated so resource consents were applied for and granted to keep BRRP operations going into 31 December 2020. Site B, which was initially designated a "sorting" or "stockpile" area, has since been designated a landfill zone. The BRRP is owned and operated by Transwaste Canterbury Ltd which has developed the site and operates the sorting area. This operation closed on 20 December 2019 and is now in rehabilitation phase.

Transwaste Canterbury Limited has taken on the financial and operational risks involved in operating the facility. The contractor is required to return the site to its pre-4 September 2010 condition once activity at the site is completed in 2020.

The Council has ongoing operation and maintenance responsibilities of parts of the landfill assets to ensure that the existing resource consents are complied with and that the site does not cause undue risk to health and safety in the City.

Burwood Gas Recovery and Reticulation

The Burwood Landfill gas recovery scheme was commissioned in early 2007. The scheme includes the following assets that are managed by the Resource Recovery Unit:

- 37 gas wells and collection piping
- Gas treatment plant

Closed Landfills

[1] **Canterbury Earthquake (Resource Management Act—Burwood Resource Recovery Park) Order 2011 http://www.legislation.govt.nz/regulation/public/2011/0254/latest/whole.html**

On Council owned land there are 48 closed landfills in Christchurch and another 8 in Banks Peninsula.

The Council has an on-going responsibility to manage the closed landfills. These assets are included in the Council's Resource Recovery asset register.

7.2.2 Critical Assets

Critical assets are those whose failure would likely result in a significant disruption in service and financial, environment and/or social cost, and therefore warrant a higher level of asset management.

The criteria used for assessing criticality for Resource Recovery assets are as follows.

- Waste tonnage capacity per day (911 Tonnes)
- Onsite storage capacity for each facility
- Council's Levels of Service to the public
- Age of facility and/or plant

Using the above framework, the critical assets for Resource Recovery is as follows:

Transfer Stations

Resource Recovery provides a contracted collection of all municipal waste on a weekly basis, with collected waste transferred to the three EcoDrop Transfer Stations. Failure of any one of these sites could be managed by substitution to another site, however in the unlikely failure of all three city sites would require alternative aggregation facility for disposal to Kate Valley. Failure of the Barrys Bay transfer station on Banks Peninsula will require residents and the collection contractor to dispose of waste at one of the Christchurch based Ecodrops which would create an increased operational cost to delivering this service.

Alternative collection and aggregation points include:

- Reopening Burwood Landfill as an emergency facility (See DRAFT Resource Recovery Disaster Resilience Plan (2012) TRIM Ref: 12/76451)
- Use of non-CCC owned facilities and collection (e.g. commercial, other Councils)

Organics Processing Plant

The Council owned facility processes all of Christchurch's kerbside organics (circa 53,000 tonnes per annum) and organics from the metro transfer Station and commercial providers. This asset is managed under contract until 2024. Failure of this asset would have a significant impact on operational expenditure and sustainability – with an alternative processing site required or disposal to Kate Valley Regional Landfill.

Materials Recovery Facility

The Council owned facility processes all of Christchurch's kerbside recycling (circa 35,000 tonnes per annum) and additional recyclables from neighbouring Territorial Authorities and Council Transfer Stations. This asset is managed under contract until 2024. Failure of this asset would have a significant impact on operational expenditure and sustainability – with an alternative processing site required or disposal to Kate Valley Regional Landfill.

7.2.3 Network Age and Lifecycle Stage

Across council Resource Recovery facilities asset condition is largely managed under contract, however major repairs and renewals are managed by council. Key facility status for resource recovery assets are;

Facility status

1. Transfer Stations and Community Collection Points – Council owned land, buildings and fixed plant operated under various contracts. Asset maintenance and condition are agreed under contract.
2. Material Recovery Facility – Council owned land only with agreed Asset maintenance and condition transferring to Council ownership at expiry of contract (EcoCentral Ltd).
3. Organic Processing Plant - Council owned land and buildings operated under contract with Waste Management NZ Ltd. Agreed asset maintenance and condition agreed under contract.
4. Regional Landfill (Kate Valley) – Not considered under the AMP – Council as a 38.9% shareholder of Transwaste Canterbury Ltd (MOU in place to send all waste under Council control to Kate Valley until 2025).
5. Burwood Landfill – Gas Collection and Treatment Plant – Council owned land and plant operated under contract with Pioneer Energy Ltd. Asset operation, maintenance and condition agreed under contract.
6. Closed Landfills – Council owned land, operations and compliance managed by Council.

Key Facility Assets considered from a lifecycle perspective include:

Transfer Stations (4)

- Buildings
- Compactors, weighbridges and other fixed plant
- Above and below ground infrastructure e.g. first flush system, wastewater pump station, backflow devices, underground pipes, power, etc
- Vegetation (boundary and site), fencing
- Hard stand areas e.g. asphalt

Organics Processing plant

- Buildings
- Aeration and Biofiltration system
- Above and below ground infrastructure
- Pond
- Vegetation (boundary and site), fencing
- Hard stand areas e.g. asphalt

Burwood Landfill

- Landfill gas wells, gas collection pipes and Treatment Plant.

The age profile (or remaining life profile) of the assets include in this AMP is shown in Figure 7-3.

The aging infrastructure across the City's Transfer Stations poses an issue with much of the buildings and plant nearing end of life, with a total replacement cost (excluding land) across Resource Recovery assets of $93.6 million

Facility Assets		Commission Date	End of Life	Potential Risk	Replacement Cost
Transfer Stations					
Parkhouse	Plant	Hydraulic compaction (manually operated) Weighbridges	Dependant on future requirements including how costly refurbishment	Service failure, LOS not met, additional transport costs	$500k $400K

			is compared to replacement		
	Buildings	Building built 1981 (38yrs old)	50-100	Facility not fit for purpose, increasing inefficiencies and costs	$10million+
Styx Mill	Plant	Hydraulic compaction (manually operated) Weighbridges	Dependant on future requirements including how costly refurbishment is compared to replacement	Service failure, LOS not met, additional transport costs	$500k $400K
	Buildings	Building built 1986 (33yrs old)	50-100	Facility not fit for purpose, increasing inefficiencies and costs	$7.8million+
Metro	Plant	Hydraulic compaction (manually operated) Weighbridges	Dependant on future requirements including how costly refurbishment is compared to replacement	Service failure, LOS not met, additional transport costs	$500k $400K
	Buildings	Building built 1984 (35yrs old)	50-100	Facility not fit for purpose, increasing inefficiencies and costs	$6.8million+
Barrys Bay	Plant	Hydraulic compaction (manually operated) - not owned by CCC	Subject to contract, Council would have to purchase and install 2 new compactor units as we do not own the current units.	Service failure, LOS not met, additional transport costs	$500k
	Buildings		Existing office/toilets facilities scheduled for replacement	Facility not fit for purpose, increasing inefficiencies, health and safety issues and costs	$100k
Organics Processing Plant					
	Buildings	Building commissioned in 2009	20-30 (depends if facility is still fit for purpose	Non-compliance requires plant	$40million+

			and/or costly replacement)	upgrade or relocation	
	Plant	Aeration and biofiltration system (2009) - will be replaced in 2021 or 2022.	25 – 30 years	Annual maintenance will be required throughout lifespan	$10million+
Burwood Landfill					
	Plant	Gas wells	3-7 years	Subject to declining gas volumes	Additional wells $125 k per 5 wells.
	Plant	Gas Treatment Plant	10 years	Annual maintenance likely to see plant last for 10 years	$4million+

Figure 7-2.3: Asset Replacement Cost

Council's asset management process includes a lifecycle profile for resource recovery assets, with date created and remaining life plotted to inform capital investment program. See Figure 7-3, below.

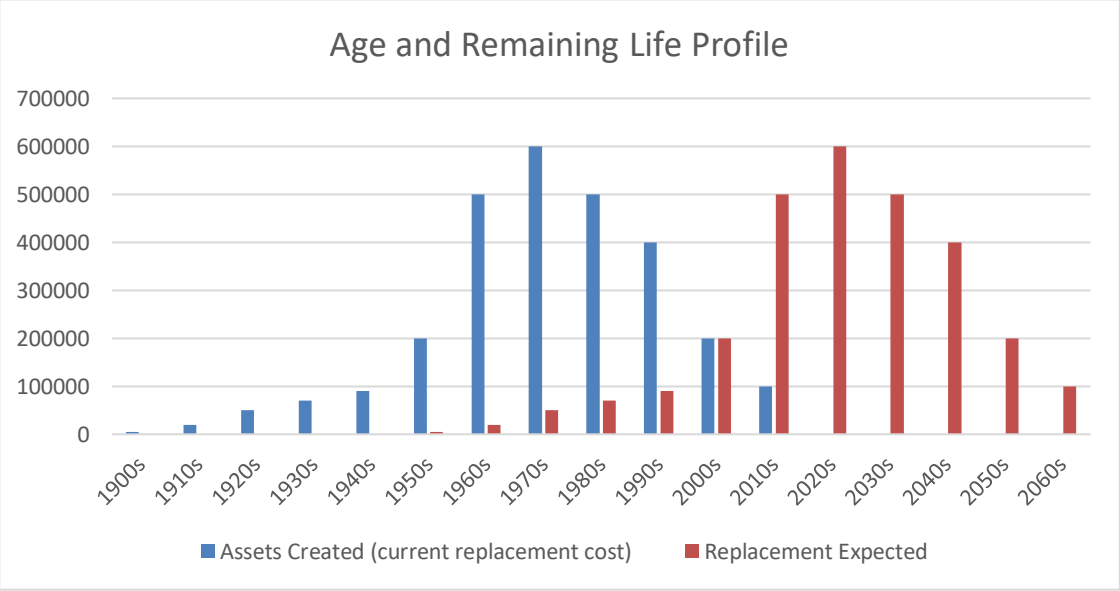


Figure 7-3: Asset Age Profile

The lifecycle stage of the assets is a useful indicator of whether the portfolio is healthy and balanced. Figure 7-4 illustrates that many of Councils resource recovery assets are due for replacement in the next 10 years, with major investment decisions required. The rising costs of landfill remediation have not been factored in from a replacement cost perspective but are likely to also require significant investment in the medium to long term.

Over the next two years Council has programmed over $30 million of infrastructure investment, including;

- major investment in upgrading Organics Processing Plant
- critical maintenance and renewals at city Transfer Stations
- upgrade of facilities at Barrys Bay
- landfill remediation works

7.2.4 Asset Data Confidence

Table 7-1 summarises the asset information available and locations held for the Resource Recovery business unit.

Table 7-1: Asset Data

Data Type	What is Measured	Frequency	Where Held
Capex and Opex Data on Contracted or Leased Assets	Contractor assets are input into the Council's SAP accounting system for insurance purposes and to help facilitate the future handover.	One Off	SAP
Three Year Capital Renewal Programme	Spreadsheet detailing the Three Year Plan for 2018 - 2021 as agreed with the Council	One Off	CCC Website
Reactive maintenance contract reports	Monthly safety check information from contractors	Monthly	Procurement and Contracts Unit
Earthquake Damage Summary	A spreadsheet which summaries earthquake damage to all Resource Recovery assets	One Off	TRIM10/679247 TRIM10/582656 TRIM11/115694 plus Contractor databases
10 Year Maintenance Plan	Spreadsheet detailing 10 years' worth of maintenance planning for all Council owned Resource Recovery assets	One Off, accuracy maintained monthly	TRIM12/522395
Construction and as-built drawings for transfer stations	Detailed Engineering drawings in CAD for each of the buildings, machinery and componentry	One Off	TRIM Folder15/1028, Folder15/361, Folder15/361for Transfer Stations, Contractor databases.
Contracts Monthly Reports	Volumes Collected (Litterbins/kerbside) Volumes Processed at Transfer Stations Volumes Processed at the OPP	Monthly	Procurement and Contracts Unit and TRIM Folder09/3626
Contracts Asset Management Plans	Asset Register and Valuation Asset condition Monthly, yearly and projected volumes Special/hazardous waste volumes	Monthly and Annually	Procurement and Contracts Unit and TRIM12/283879TRIM12/467051 TRIM14/670980

Data Type	What is Measured	Frequency	Where Held
	Rejected waste volumes Minimum residual condition at operations expiry date Malfunctions, failures and non-performance		
Resource Consent Compliance Management	Resource consent conditions and current compliance Monitoring results Landfill Development and Management Plan Landfill Annual Report	Monthly and Annually	TRIM12/612730 and Environment Canterbury

Asset management information for Resource Recovery assets are primarily stored using the Tier 1 information system – Primary information technology systems; these systems are organisational systems that operate across all assets (i.e. SAP – integrated real time business information system, TRIM – the Council's electronic filing system, Intergraph – spatial display of asset information, and CPMS – capital programme management):

- SAP (asset parameters and financial data);
- Geomedia is the CCC GIS system used to map the location of assets which can be viewed by Smartmap;
- TRIM (HPE Records Manager); and
- CPMS (Capital Projects Management System = an electronic system for managing capital projects).

Additional functionality is often required in the Resource Recovery area to process, analyse and use the data. These are called Tier 2 information systems - specific to individual activities and groups when Tier 1 applications do not provide the functionality required and examples specific to Resource Recovery asset are:

- SCADA (real-time data collection and management for Resource Recovery process assets);
- MEX Computerised Maintenance Management Software (Contractor specific software e.g. Living Earth Limited at the Organics Processing Plant).

Asset data is based on operations and maintenance reports and lease agreements requiring Asset condition reports. Asset data confidence across the building and plant owned by Council is Medium-High.

Current Level of Asset Management Maturity

In 2020 the Resource Recovery unit was added to the asset maturity assessment, providing a current maturity status across council's asset portfolio and provided a clear mandate to improve asset information across the activity.

The current level of maturity varies from 'core' to 'advanced', predominantly achieving an 'intermediate' level. The desired level of maturity is 'advanced' in all but six functions. Further details of the maturity review findings and the desired levels are contained in the Plan Improvement and Monitoring section of this AMP.

The current levels of Resource Recovery asset management maturity are summarised in **Table 7.2,** below.

Table 7-2: Asset maturity level

Asset Management Function	Asset Management Practice Area	Maturity Level (Resource Recovery)
Understanding and Defining Requirements	AM Policy and Strategy	Core

Asset Management Function	Asset Management Practice Area	Maturity Level (Resource Recovery)
	Levels of Service and Performance Management	Advanced
	Demand Forecasting	Intermediate
	Asset Register Data	Core
	Asset Condition Assessment	Intermediate
	Risk Management	Core
Lifecycle Decision Making	Decision Making	Intermediate
	Operational Planning and Reporting	Intermediate
	Maintenance Planning	Intermediate
	Capital Investment Strategies	Intermediate
	Financial and Funding Strategies	Intermediate
Asset Management Enablers	Asset Management Team	Advanced
	Asset Management Plans	Intermediate
	Information Systems	Intermediate
	Service Delivery Models	Intermediate
	Quality Management	Core
	Improvement Planning	Core

7.2.5 Asset Data Improvements

Asset management information for Resource Recovery assets are primarily stored using the Tier 1 information system – Primary information technology systems; these systems are organisational systems that operate across all assets (i.e. SAP – integrated real time business information system, TRIM – the Council's electronic filing system, Intergraph – spatial display of asset information, and CPMS – capital programme management):

- SAP (asset parameters and financial data);
- Geomedia is the CCC GIS system used to map the location of assets which can be viewed by Smartmap;
- TRIM (HPE Records Manager); and
- CPMS (Capital Projects Management System = an electronic system for managing capital projects).

Additional functionality is often required in the Resource Recovery area to process, analyse and use the data. These are called Tier 2 information systems - specific to individual activities and groups when Tier 1 applications do not provide the functionality required and examples specific to Resource Recovery asset are:

- SCADA (real-time data collection and management for Resource Recovery process assets);
- MEX Computerised Maintenance Management Software (Contractor specific software e.g. Living Earth Limited at the Organics Processing Plant).

Asset data is based on operations and maintenance reports and lease agreements requiring Asset condition reports. Asset data confidence across the building and plant owned by Council is Medium-High.

7.3 Asset and Network Planning

7.3.1 Asset planning strategies

Council produce a Waste Minimisation and Management Plan (WMMP) every 6 years, with the latest Plan delivered in 2020. The WMMP outlines Council's strategy and approach towards Resource Recovery services and establishes demand for collection and waste processing facilities.

The WMMP addresses broader goals for new services such as an expanded inner city collection model (listed separately), as below.

Closed Landfills pose a significant asset risk, with unknown asset condition and resilience challenges, Council are currently undertaking an assessment of known closed sites to better understand the costs and requirements for remediation – this will form a separate Closed Landfill Prioritisation process.

Plan, Strategy, Model	Content	Next review
Waste Management and Minimisations Plan	Strategic direction for waste service delivery	2020, 2026
Service Delivery Review	Review fit for purpose of existing service delivery models including contract review, ahead of major contract terms expiring in 2024.	2021
Closed Landfill Prioritisation	Risk assessment	2021

All options developed in each Plan will consider the lifecycle costs of each alternative.

7.3.2 Asset Planning Improvements

The improvements to asset planning processes are included in the AM Improvement Plan in Section 10.

7.4 Asset Creation (Design and Build) and Acquisition

7.4.1 Identifying and recording capital projects

New works are those works that create a new asset that did not previously exist or works which upgrade or improve an existing asset beyond its existing capacity. Assets may be developed by Council, or by developers and then handed over on completion of the development. In this AMP, a number of projects have been identified through consideration of:

- Level of service requirements (Section 3).
- Growth and demand requirements (Section 4).
- Investment in network resilience (Section 5).
- Other asset planning initiatives described in Section 7.2.

7.4.2 Selection criteria

Potential projects for new assets are collated, recorded and then selected using criteria for inclusion into the capital works programme. For Resource Recovery assets investment is prioritised on the basis of regulatory compliance, asset condition, asset demand and risks (See sections 4 and 5).

7.4.3 Level of Service requirements

Projects are developed to meet a agreed Level Of Service (LOS), e.g. recycling contamination rates.

Identified and documented through the following processes:

- Requirements to support current and future LOS targets
- Identifying and responding to urgent issues such as consent compliance thresholds and risk screening.

7.4.4 Growth and demand requirements

Identified and documented through the following processes:

- Growth and demand forecasting
- Vision and goals developed through Council's Waste Minimisation and Management Plan 2020
- External requirements; Central Government policy, Market changes and innovative technologies

7.4.5 Investments in network resilience

Risk and resilience is generally considered in conjunction with asset renewal, growth and demand, and regulation compliance. As a tactic to improve resilience within the capital work programme, Council look to add logical and often low cost resilience measures to the renewal, improvement and growth projects.

Identified and documented through the following processes:

- Risk and resilience workshops
- Increased resilience awareness and mindset
- Asset management plans

7.4.6 Asset Design

The design phase is where a lot of value can be added to the project. The aim is to report whole-of life costing (Capex + Opex) for the whole project when considering design options. We use todays' dollars to report, for the purposes of simplicity.

When designing new Resource Recovery assets, including acquisitions, Council needs to understand the asset demand (above) and how assets will deliver the strategic objectives identified in council's WMMP 2020.

Considerations of climate change impacts and the city's growth need to be considered carefully, as does the changing resource recovery environment including, costs of disposal, value of output products and collection methodology.

New assets need to meet current service delivery but also provide the agility to meet changes to how we manage the waste products we produce. A specific program of works has been developed in the WMMP 2020, including a detailed Action Plan (*https://ccc.govt.nz/the-council/plans-strategies-policies-and-bylaws/plans/waste-management-and-minimisation-plan).*

7.4.7 Capital Investment Programme

Council's capital program for resource recovery can be split into three categories;

- Renewals and replacement projects
- New equipment and facilities development
- Landfill aftercare program

Project Number Name	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	Total
106 Waste Transfer Stations Renewals and Replacements	700,000	732,468	783,605								**2,216,073**
109 Solid Waste Renewals	494,000	273,141	290,186								**1,057,327**
111 Solid Waste new equipment	31,281	32,064	33,524								**96,868**
161 Closed Landfills Aftercare	450,000	469,557	482,944								**1,402,500**
162 Closed Landfill Aftercare Burwood	511,000	337,590	535,323								**1,383,913**
2598 Burwood Gas Treatment Plant Renewals	450,000		96,379								**546,379**
37828 Programme - Waste Transfer Stations Renewals	0	0	0	863,335	881,581	905,618	931,239	240,824	1,008,430	1,060,836	**5,891,863**
37830 Programme - Solid Waste Renewals	0	0	0	99,864	110,060	120,824	131,047	140,680	154,577	170,087	**927,137**
37831 Programme - Solid Waste New Equipment	0	0	0	36,940	1,007,257	2,299,276	2,362,423	1,227,966	36,804	37,797	**7,008,463**
37832 Programme - Closed Landfill Aftercare	0	0	0	495,021	507,377	520,561	534,622	549,604	579,049	609,791	**3,796,025**
37833 Programme - Burwood Closed Landfill After Care	0	0	0	57,985	112,261	57,589	59,145	60,803	63,794	134,810	**546,387**
50264 Inner City Waste Collection System	430,108	1,121,049	1,047,600								**2,598,757**
59935 Bexley Closed Landfill Foreshore Remediation Project	1,500,000										**1,500,000**
60426 Programme - Waste Transfer Station Improvements		102,300	104,760	107,380	110,060	112,920	115,970	119,220	122,680	125,990	**1,021,280**
60427 Transfer Station Site Redevelopments		920,700									**920,700**
60428 Transfer Station Stormwater Treatment	256,000										**256,000**
60429 Transfer Station Odour Mitigation	204,000										**204,000**
60430 Barrys Bay Site Redevelopment		306,900									**306,900**
60431 Living Earth Plant Development	15,000,000	6,649,500									**21,649,500**
60432 Materials Recovery Facility Building & Fixed Plant Renewals			101,617	125,635	150,782	200,998	226,142	251,554	284,618	318,755	**1,660,100**
60433 Organics Processing Plant Building and Fixed Plant Renewals			306,947	351,133	375,305	400,866	426,770	451,844	490,720	609,792	**3,413,375**
60434 Community Collection Point Renewals		51,150									**51,150**
Total	**20,026,389**	**10,996,419**	**3,782,884**	**2,137,292**	**3,254,683**	**4,618,652**	**4,787,357**	**3,042,494**	**2,740,671**	**3,067,856**	**58,454,698**

Figure 7-4 10 Year Capital Program (CPMS)

7.4.8 Management of Vested Assets

With Council's Resource Recovery facilities managed under contract, assets are created and maintained to ensure council meets the objectives defined in its WMMP 2020.

For example, investment in recycling processing infrastructure to meet the challenges in the recycling market align with include; Enhanced sorting infrastructure at Materials Recovery Facility (vested to Council at end of contract term).

Regular contract meeting address asset condition and agree any required works, given the contract terms for the combined transfer stations and MRF contract and the OPP contract all expire in 2024, council has commenced a Service Delivery Review which will inform future contractual arrangements.

At contract term Resource Recovery assets are acquired by Council, each must be approved as compliant to Council requirements by the business unit which is accepting them for operational purposes. Vesting agreements should not proceed for assets which fail to meet requirements.

Capital works are carried out to adhere with standard Contract documents which list Council's design, specification and construction documents that the works must accord with. If the quality of construction is demonstrated through the provision of the required quality assurance records and compliance with Contract and/or Consent documents the hand over will be accepted.

7.4.9 Asset Creation and Upgrade Improvements

The following improvements to asset creation processes are included in the AM Improvement Plan in Section 10.

- Complete the works highlighted by the Asset Management Unit to improve the Asset Data Handover Process including the empowerment of staff in Roles and Responsibilities
- Asset condition data to be reported directly by Contractor into Councils Tier 1 database

7.5 Operations and Maintenance

7.5.1 Portfolio-level O&M Strategies

Operating costs for Resource Recovery are managed under separate contracts which can split into three key categories:

- Collection of domestic waste, recyclable materials and organic materials from households through the "three-bin" collection, currently operated by Waste Management (formerly known as Transpacific);
- Processing and on selling of recyclable material through the Materials Recycling Facility (MRF) currently operated by EcoCentral; and

- Processing of organic material into compost and on selling of compost through the Organic Processing Plant (OPP) currently operated by Living Earth.

Maintenance costs for Resource Recovery include the closure of the Burwood Resource Recovery Park and management of other former landfill sites and maintenance of the Transfer Stations at Styx Mill, Parkhouse Road, Metro Place and Barrys Bay.

7.5.2 Operations and Maintenance Improvements

Improvements to operations and maintenance processes are included in the AM Improvement Plan in Section 10.

7.6 Renewals

7.6.1 Portfolio Renewal Strategies

Renewal expenditure is major work which does not increase the asset's design capacity but restores, rehabilitates, replaces or renews an existing asset to its original or lesser required service potential. Work over and above restoring an asset to original service potential is upgrade/expansion or new works expenditure.

In liaison with the operator (contractor) for each Resource Recovery asset, Council maintain an asset condition register and planned renewals schedule. Scheduled renewals are prioritised in accordance with asset lifecycle stage, with a maintenance budget against each contract for reactionary and unscheduled works.

Going forward asset data will be recorded in Council's tier 1 system, providing greater oversight and consistency.

7.6.2 Renewal Process Improvements

The following improvements to asset renewal processes are included in the AM Improvement Plan in Section 10.

- Update all asset condition data into tier 1 database, and develop dashboard views of asset renewals information.

7.7 Asset Disposal

Disposal includes any activity associated with disposal of a decommissioned asset including sale, demolition or relocation. Any revenue gained from asset disposals is accommodated in Council's long-term plan.

Key asset disposal strategies for Resource Recovery include:

- Landfill aftercare: Reinstatement and transfer of former BRRP asset to Parks for recreational use.
    - Ensuring assets are managed in safe manner and incorporating future acquisition strategy if assets are required (e.g. due to future disaster events).

8 Lifecycle Management Plans

This section is not applicable to the Resource Recovery AMP, with major assets managed under Contract.

The principles covered under this Plan records Resource Recovery asset lifecycle phases, including:

- Planning
- Acquisition
- Operations and maintenance
- Disposal

In the Resource Recovery activity, major assets are managed under contract (including Organics Processing Plant, Transfer Stations and Materials Recovery Facility. These contracts and the associated asset condition will be assessed as part of the Service Delivery Review to be completed ahead of contract expiry.

Contract overview Table 8.1

Contract	Type of Service	Contract expiry
Waste Management NZ Limited	Operates transfer stations in Banks Peninsula (waste and recycling stations) under contract	31/05/2029
	Operate assets associated with kerbside collection of waste, recyclables and organics	31/01/2029
Waste Management NZ Limited (T/A Living Earth)	Contracted to lease, operate and maintain the facility to 2024 the Organics Processing Plant	31/01/2024
EcoCentral Limited[1]	Operates Transfer stations including recycling centres in the city (EcoDepots)	31/01/2024
	Owns and operates the EcoSort Materials Recovery Facility and other buildings and plant at the Parkhouse Road Recycling Processing Site, Ownership of this facility passes back to CCC in 2024.	31/01/2024
Burwood Resource Recovery Park Limited (BRRP Ltd) owned by Transwaste Canterbury.	Responsible for the operation and closure of the Burwood Resource Recovery Park	2021

9 Financial projections and trends

This section outlines the long-term financial requirements for the activity based on the long-term strategies and tactics described earlier in the Plan.

9.1 Operating Forecasts

9.1.1 Financial Projections

The primary operating costs of the Resource Recovery unit are kerbside collections, recycled and organic materials processing (maximising diversion from landfill), Transfer Station operations and associated assets, monitoring and remediating the closed landfill sites around the city and Banks Peninsula.

9.1.2 Key Assumptions

General assumptions in preparing this forecast include:

- Household growth continues in line with current projections of 1600 per annum, which is the equivalent of 4800 new bins per annum, understanding the increased projected growth for the inner city will change the demand for these services
- Contracted cost increases are in line with projected inflation (CPI) indicators, however it should be noted that the contracted collection costs are susceptible to other factors including the price of diesel fuel and the transport index. Expiry of current contracts terms (2024) for major reprocessing facilities may provide an opportunity in the future for new levels of service and cost savings
- At the time of writing the plan, there are issues relating to the collection and processing of recycled material. It is assumed that these issues are addressed in the short – medium (2-3 years) term either through the resumption of sorting recycled material or through some other viable mechanism
- Financial projections for the organics processing plant are based on continuation of existing operating costs, however subject to a finalised design for $21.7 million redevelopment, operational expenditure for this site may change
- The Burwood Resource Recovery Park (BRRP) closes from 31 March 2021
- Monitoring work on the remaining closed landfill sites (excluding the BRRP) continues and any remediation work required is identified and managed through the Annual Planning and Long Term Planning processes

Significant risks associated with these assumptions include:

- Changes in international markets for recycling have influenced global demand for commodities, with significant impact to the value of recycled materials. This has impacted the viability of kerbside recycling and the Materials Recycling Facility (MRF), with further investment planned to improve quality of output materials ($16.5 million through Central Government).
- In response to community concerns and regulatory compliance, Council endorsed a $21.5 million package to upgrade the organics processing facility in 2020. Emerging risks associated with managing former landfill assets from the effects of climate change is based on current known information and modelling. The potential impacts of a significant event are difficult to account for, due to the unknown scale and severity.

Assumptions relating to each asset group have been identified under the Lifecycle Management asset group sub-sections.

9.1.3 Significant Changes

The significant changes in expenditure are shown in Table 2-1.

Item	Movement	Rationale for change
Personnel	↔	There is no significant change in personnel required

Contracts	↑	Contract costs will increase in line with growth within the City and Banks Peninsula and will be funded by the additional households as they come online. Price fluctuations within each contract are dependent on a number of factors including global oil and commodities prices, Government Policy and movements in domestic price indices
Materials	↔	There are no significant cost of materials for the unit
Energy	↑	Landfill gas is predicted to decline over the next 3-7 years, resulting in increased energy costs to council facilities currently utilising landfill gas. Redevelopment options of resource recovery processing sites to include investigation of alternative sources of electricity
Waste disposal	↑	Increased costs of disposal include; • increased gate fees (waste disposal levy), • ability to divert from landfill (i.e. potential market failure (recycling) or failure to divert organic material), • contamination in kerbside collections

Table 9-1: Activity Operating Costs – Significant Changes

9.1.4 Financial Projections

Operational expenditure for the Resource Recovery unit is projected to increase between 2021-2024 due to increase in the Waste disposal Levy. From 2024 with a levy of $60/tonne ongoing expenditure is projected to be relatively linear, with forecast expenditure flat lining around $60 million per annum (non-inflated). See 10 year forecast below.

Council's long-term Resource Recovery contracts are coming to the end of their contract term, with processing contracts expiring in 2024 and collections in 2029. Any changes in the contract structure or Levels of Service will significantly influence operational expenditure beyond 2024 and 2029.

Operating costs (and revenue) will be influenced by changes to the Waste Disposal Levy (with prices set to increase from $10/tonne to $60/tonne in 2024. These increased costs for sending waste to landfill are partially offset by levy revenue distributed to Local Authorities on a per population basis. Significant increases in the total levy revenue distributed may impact future operations costs for the activity.

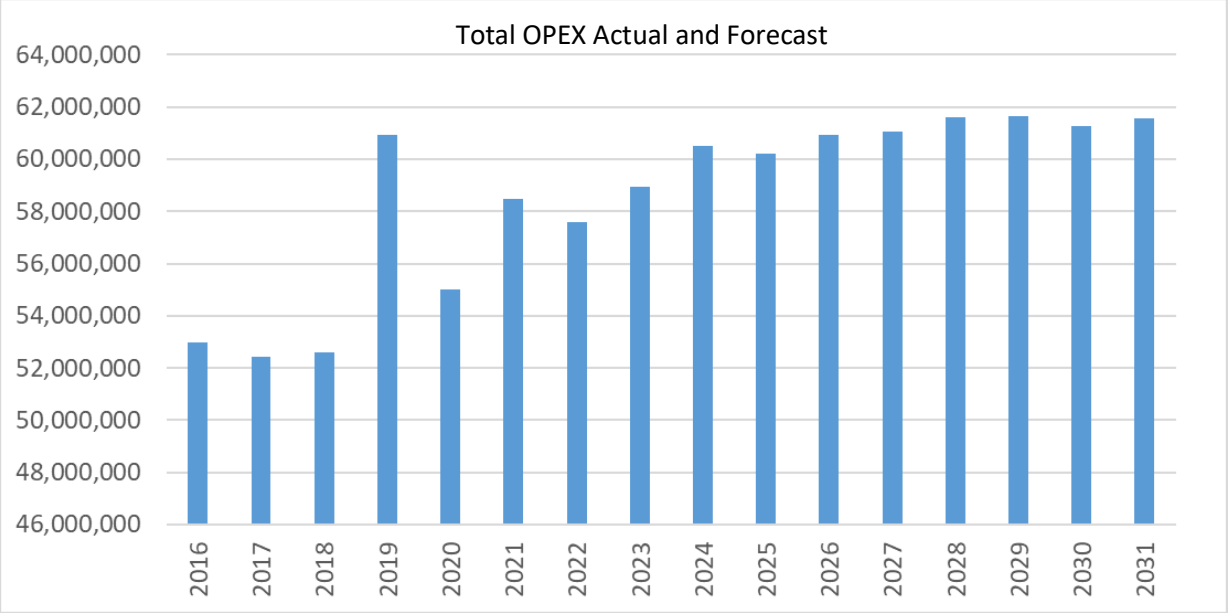


Figure 9-1: Activity Operating Costs - 10 Year Summary Capital Forecasts (non-inflated)

Capital expenditure largely consists of maintenance and renewals, including major investment in the Organics Processing Plant over the next two years, Materials Recovery Facility upgrades in 2034 and development of a new city transfer station to meet growing population in 2040, See Figure 9-2 below.

Resource Recovery manages its assets under an external contract structure, the majority of Resource Recovery assets will be managed on a renewals or replacement basis with capital expenditure largely linked to Renewals, meeting our Levels of Service (e.g. Consent Compliance) and new services. See Figure 9-2 below.

Capital investment requirements to address renewal, level of service, growth and resilience requirements are detailed in the Lifecycle sections. These are compiled and presented in **Error! Reference source not found.**.

The most significant projects and programmes over the next 10 years include:

- Redevelopment of Organics Processing Plant ($21.7 Million)
- Transfer Station Renewals
- Landfill Remediation Program (largely reactive and unbudgeted in the LTP).

Looking beyond 2031, key Capital investment will be required for Materials Recovery Facility (MRF) upgrades (2034) and Development of new (4th) City Transfer Station – to meet population growth (2040).

9.1.5 Key Assumptions

General assumptions in preparing this forecast include:

- Asset forecasts are non-inflated
- Assets are managed under contract, with no significant changes to Levels of Service in the forecast period
- Asset demand linked to population growth, with operational expenditure related to population serviced
- New assets (e.g. MRF at end of contract term) are acquired at agreed condition levels
- New landfill remediation projects are not accounted for despite significant potential future costs

Significant risks associated with these assumptions include:

- Ongoing contract management structure may be reviewed on the outcome of a Section 17A review to be completed ahead of contract term
- Do not include potential changes in operational expenditure due to changes in Government Policy, processing and or disposal technologies and other influences
- unplanned expenditure for landfill remediation may need budget allocation

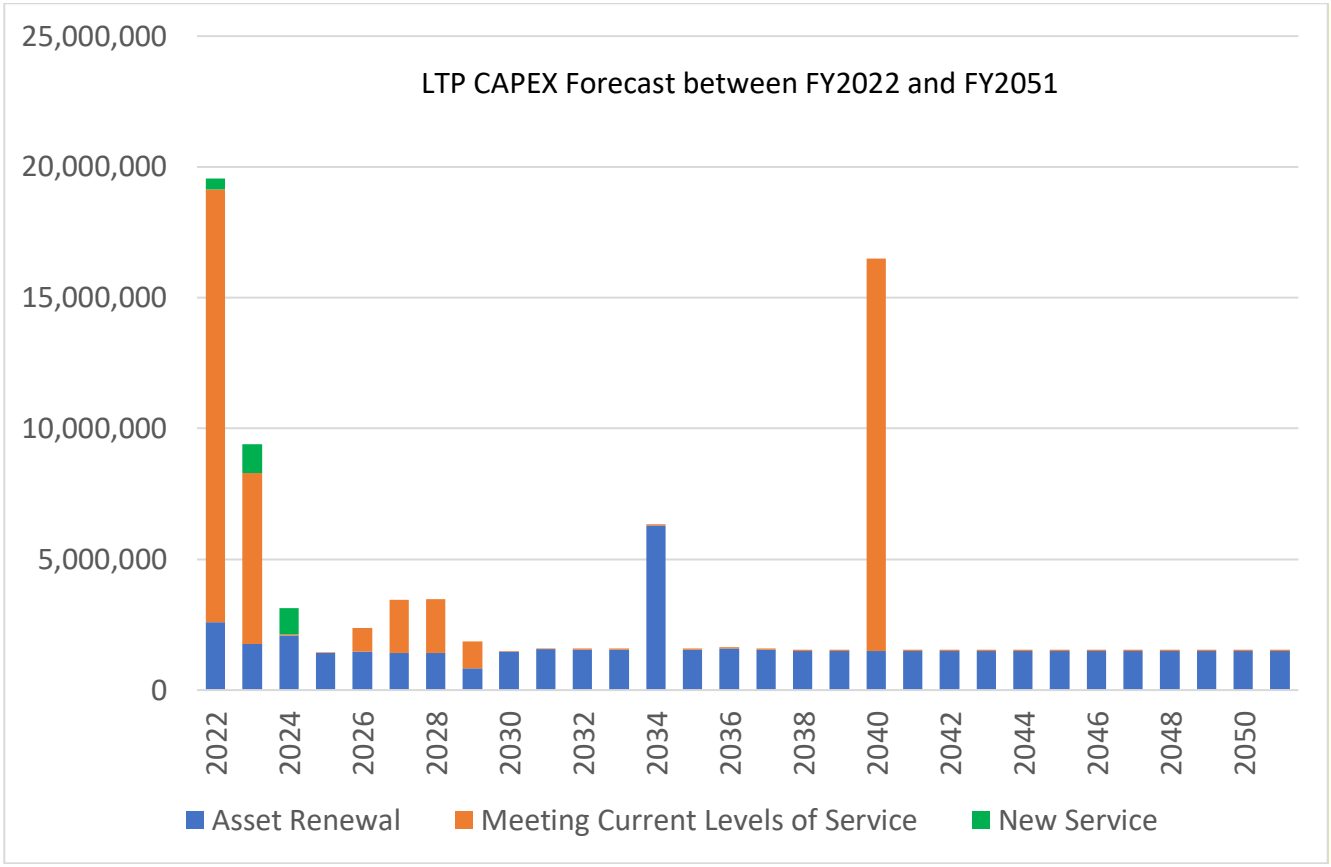


Figure 9-2: 30-Year Capital Forecasts (non-inflated)

9.2 Input Data Confidence Levels

The expenditure and valuations projections in this AM Plan are based on best available data. Currency and accuracy of data is critical to effective asset and financial management. Data confidence is classified on a 5 level scale in accordance with Table 9-2.

Confidence Grade	Description
A Highly reliable	Data based on sound records, procedures, investigations and analysis, documented properly and recognised as the best method of assessment. Dataset is complete and estimated to be accurate ± 2%
B Reliable	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate ± 10%
C Uncertain	Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available. Dataset is substantially complete but up to 50% is extrapolated data and accuracy estimated ± 25%
D Very Uncertain	Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete and most data is estimated or extrapolated. Accuracy ± 40%
E Unknown	None or very little data held.

Table 9-2: Data Confidence Grading System

The estimated confidence level for and reliability of data used in this AM Plan is shown in Table 9-33.

Data	Confidence Assessment	Comment on Reliability of Forecasts
Operations expenditure	B	Based on Asset Management Maturity Assessment (Nov 2020)
Maintenance expenditure	B	
Renewals (asset value, lives, condition, performance)	C	
Upgrade/New expenditures (level of service, demand, resilience projects)	B	
Disposal expenditure	B	

Table 9-3: Data Confidence Assessment for Data used in AMP

9.3 Valuation and Depreciation

9.3.1 Valuation Basis

Detailed valuation and depreciation forecasts have not been assembled for Resource Recovery unit as the overall impact of these costs are minimal to the management of assets. Resource Recovery assets tend to be managed under contract within a serviceable lifetime, for this reason a detailed comparison has not been included in this section.

9.4 Implications of approved ten-year budget

9.4.1 What we cannot do

The Council has prioritised decisions made in adopting the 2021 LTP to obtain the optimum benefits from its available resources.

There are some operations and maintenance activities and capital projects identified in this AMP that are unable to be budgeted for the next 10 years. These include:

- Quantify required closed landfill remediation works - Moving forward we aim to take a more pro-active approach in managing our assets including further work (and funding) required to improve understanding the current state and risks associated with closed landfill sites, including future exposure due to increasing effects of climate change. Funding for this exercise is not included in the draft LTP.

Service consequences

Operations and maintenance activities and capital projects that cannot be undertaken will maintain or create service consequences for users. These include:

- Requirement to fund reactive remediation projects where closed landfill sites become an issue due to climate change.

Risk Consequences

The operations and maintenance activities and capital projects that cannot be undertaken may maintain or create risk consequences for the organisation. These include:

- Risk of non-compliance with resource consents and additional costs associated with clean-up of contaminated materials (as per Fox River, 2019)

10 Continuous Improvement

10.1 Overview of the Improvement Programme

Council has made a strong commitment to the improvement of asset management practices and seeks to further improve the approach. Council acknowledges the need to focus efforts to further asset management practices over the next 2-3 years to an appropriate level of capability.

Council's overall AM improvement process is outlined in the SAMP. This section details the Resource Recovery improvement programme.

Council works closely with each it's contractors on continual improvement, this includes new technologies and processes that maximise efficiency and drive up Levels of Service. Regular contract meetings discuss innovation and work through existing processes to identify new approaches that improve outcomes.

Council and its suppliers are committed to ensuring continuous improvement in the efficiency and effectiveness of delivery of Resource Recovery services, as well as investigating opportunities for innovation. This includes regular discussion on options for continuous improvement and reporting on improvement initiatives.

An example of this in the Kerbside collection contract as below:

Area for improvement	Options to operationalise	Timeframe
1. Collection Drivers to identify and report Contaminated Bins	Drivers that are not reporting contamination to receive relevant training	26 February, 2021 and ongoing program for new drivers
2. Correct Vehicle Sizing for all streets	Vehicle sizing appropriate for the street.	31 March, 2021
3. Wheelie bin Collection and Placement	Adhere to contractual obligations. Part 1: General Specification 4. Operations,	21 February, 2021
4. Monthly invoicing – transparency	Futile delivery charges, RFID tally reducing bin numbers against total number in service.	26 February 2021
5. Bins in hopper	Resolve the issue of bins falling into the collection truck	31 March, 2021
Area for supplier development	**Options to operationalise**	**Timeframe**
1. RFID Tagging and Auditing Project	Implemented over 4.5 years, software and hardware requires further improvement Ensure the contractor meets the conditions, including delivery of technology	12 February, 2021
2. Adherence to the contract	Monitoring performance against contractual KPI's.	Monthly operational meetings

	Raise customer satisfaction through ongoing continual improvement program	
3. Development of B2B	Integration of data from kerbside services and CCC ratepayer database.	31 December, 2021.

10.2 Current Asset Management Maturity

An independent assessment of current asset management practice has not been undertaken as Resource Recovery was not in previous scope.

The baseline maturity assessment was predominantly achieved through onsite interviews, with a good cross-section of participants. Future maturity level was also set based on appropriate best practice and considering the agreed business drivers. Strength and opportunities for improvement are summarised alongside the results to acknowledge the baseline achievements.

The appropriate level of AM practice for this Activity has been defined in our AM Policy as 'Core'.

A summary of the assessment results for this activity is included in Figure 10-2 –The key recommendations require better visibility of asset data – this process is now underway.

Figure 10-2 Resource Recovery Asset Management Maturity Assessment (TRIM 20/1441960_CCC AMMA Final Report Nov 2020)

10.3 Review of Progress against Previous Plan

Not measurable, this AMP being the first detailed Plan produced by the business unit.

10.4 Improvement Plan 2019

The independent asset management maturity assessment process provides a sound basis for prioritising and monitoring improvements to current asset management practices.

The Resource Recovery unit is currently preparing an improvement program based on the WMMP Action Plan 2020 and guidance received in the AMMA Report.

Table 10-1: Asset Management Improvement Tasks

Task ID	Project / Task	AM Maturity Gaps	Priority (H, M, L)	Responsibility	Resources (teams, $)
1	Update all asset condition data into tier 1 database, and develop dashboard views of asset renewals information.	Data	M	AMU	Asset Management Unit
2	Implement an asset quality schedule with site operators to ensure assets are maintained in accordance with agreed disposal conditions.	Data	H	Contract Supervisor(s)	Resource Recovery unit
3	Update closed Landfills risk register and utilise risk based approach to manage risks at these sites	Risk assessments	M	Landfill aftercare officer	Resource Recovery unit
4	Complete Service Delivery Review on asset requirements for delivering resource recovery services in the future.	Asset demand information	M	Manager Resource Recovery	Resource Recovery unit
5	Complete 17a review and address asset acquisition – related to end of major contract term (2024)	Asset demand information	M	Manager Resource Recovery	Resource Recovery unit

Figure 10-1: AM Improvement Programme Timeline

10.5 Resourcing the improvement programme

The activity requires resources and budget (costs not yet estimated) to deliver the improvement plan tasks. Consideration of existing workloads and other corporate priorities may require changes to the indicative completion dates shown in the improvement programme.

It is likely that across Council, a lack of resources will result in difficulty delivering all the improvement items. A prioritisation and costing exercise will be required to ensure the highest priority items are delivered first and that future delivery costs are understood, and sufficient budgets allocated within the LTP. The process to prioritise improvement items will be coordinated by the AMU.

10.6 Monitoring and review

The improvement programme will be reported to the AMU and either included within the advancing asset management improvement programme (corporate) or within the continuous improvement programme (unit based). All improvement items will be monitored by the AMU and tracked through the Council's Asset Management Governance Board and the PDP tool.

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[i] Ministry of Business, Innovation and Employment, Canterbury Job Matching report September 2016. http://www.mbie.govt.nz/info-services/employment-skills/labour-market-reports/canterbury-labour-market/document-image-library/canterbury-job-matching-september-2016.pdf

[ii] Statistics New Zealand, Regional Gross Domestic Product. Year ended March 2016 (released March 2017) http://www.stats.govt.nz/browse_for_stats/economic_indicators/NationalAccounts/RegionalGDP_HOTPYeMar16.aspx

Looking ahead

Organics plant upgrades

We are updating our facilities to enable us to meet our consent conditions and continue to process organic materials locally, rather than transport them to landfill.

Recycling market

Nationally, regionally and internationally there is great uncertainty over recycling. This complicates our planning and our waste minimisation efforts. We will need to be flexible and able to respond quickly to constantly changing circumstances, while also working within financial constraints.

In 2018 China, the world's largest buyer of recycled commodity products, implemented National Sword, its foreign trade policy, which included severe restrictions on recycling imports and strict contamination limits.

This significantly affected global markets – commodity prices plummeted with a shortage of alternative export destinations and the supply of materials far exceeded export opportunities. Other former receiving nations have followed China's example and restricted imports.

In Christchurch the price received for material collected through the kerbside service has dropped significantly. Should these prices decrease further, the cost of recycling will increase, and we will need to identify new options for reprocessing or consider the viability of the materials we currently collect.

We're working with central government, industry and other territorial authorities to ensure investment decisions enable a shift towards a circular economy that focuses on the diversion of valuable resources from landfill.

Central government is working on waste reduction and minimisation initiatives, but the scope and impact of these is not yet known.

Climate change, earthquakes and tsunami

Closed landfills are vulnerable to the effects of climate change, whether from coastal inundation, storm surge, erosion and landslides, rising groundwater and increased river flows.

Climate change effects could lead to saturation and materials, including hazardous substances, leaching from the landfill.

We own 46 closed landfills across the district, with 15 of them being in coastal areas and/or close to rivers.

We also know of 131 non-Council closed landfills, including private tips and old municipal landfills dating back to the 1870s. Many of these are in rivers or gullies. They are not lined or sealed, and we don't know what materials they hold.

Closed landfills on Banks Peninsula may be vulnerable to landslides. Capping these landfills and planting over them may improve their stability.

Erosion along the coast and in rivers will need to be carefully monitored to avoid landfills from rupturing and spilling hazardous contents, including asbestos, heavy metals, hydrocarbons, pesticides and other dangerous waste.

As exposure increases it may be necessary to move closed landfills and their contents to alternative disposal sites, including Kate Valley.

Closed landfills are closely monitored and we are working with Environment Canterbury and central government to identify the best way to manage them as the effects of climate change increase.

Continuous improvement

We have a strong commitment to continuous improvement.

We need to implement an asset quality schedule with our site operators to ensure our assets are maintained in accordance within agreed conditions.

Another area of improvement will be to update the risk register in relation to closed landfills and to use a risk-management approach in managing these sites.