

18 June 2026

David Christensen

s7(2)(a)

Tēnā koe David,

Request for Information – Local Government Official Information and Meetings Act (LGOIMA) 1987

We refer to your official information request dated 23 April 2026, seeking information relating to Hutt City Council's implementation of the Wellington Region Waste Management and Minimisation Plan (WMMP) 2023–2029, specifically Council's progress, performance, and supporting evidence against its adopted WMMP Action Plan.

In your original request, you sought the following information for each action within Council's WMMP Action Plan:

1. *Current Status: The current status of the action (e.g. not started, in progress, completed, delayed, abandoned), and the date the status was last formally updated.*
2. *Evidence of Progress: All reports, emails, internal documents, dashboards, or other records used to assess progress, including any quantitative measures, KPIs, or performance indicators, and any documented outcomes achieved to date.*
3. *Decision-Making and Governance: All Council reports, briefings, or memos provided to elected members relating to the action, including records of decisions (formal or informal) affecting delivery, scope, timing, or funding, and any identified risks, issues, or barriers.*

4. *Resourcing and Funding: Budget allocated to each action (initial and current), actual expenditure to date, and any changes to funding assumptions or delivery models.*
5. *Variances from Plan: Any deviations from the original Action Plan (including scope, timing, or delivery approach), the reasons for those deviations, and identification of any actions that have been deferred, paused, or discontinued.*
6. *Internal and External Reporting: All information provided by Council to the WMMP Joint Committee relating to these actions, along with any internal performance reporting, including reporting to senior leadership teams.*

On 29 April 2026, we wrote to you seeking clarification of your request. In particular, we advised that, with the way your request was originally framed, responding would require a substantial amount of staff time to identify, assess, and collate information across multiple teams and systems, and was therefore unlikely to be met within the statutory timeframe.

We therefore asked whether you would consider refining your request so that it focused on a smaller number of specific actions, limited the types of information sought, excluded informal material such as emails and working documents, and specified a narrower timeframe.

Later that day, you responded and confirmed that you were willing to refine the scope of your request. Your refined request sought information relating to the following actions within the Hutt City WMMP Action Plan:

- *Action 11 – Investigation of emerging technologies and approaches for the future of waste disposal*
- *Action 12 – Support for the development of regional resource recovery networks*
- *Action 13 – Collaboration with other councils on construction and demolition waste processing*
- *Action 14 – Reduction of food and green waste to landfill*

For each of these actions, you requested governance and management reporting used to monitor or assess progress, performance reporting including

any metrics, indicators, or tracking frameworks used, and financial or funding information relating to implementation where applicable. You also clarified that the request excluded informal material such as general email correspondence and working documents, unless these formed part of formal reporting or decision making processes.

You confirmed that the timeframe for the refined request was 1 July 2023 to present.

On 18 June 2026, Council wrote to you again to advise that an extension had been sought under section 14(1)(b) of the LGOIMA. This extension was necessary as the consultations required to make a decision on the request meant a response could not reasonably be provided within the original timeframe. You were advised that you could expect a response by no later than 22 June 2026.

Answer:

Before responding to your request, we consider it helpful to provide some contextual information about how reporting is undertaken for activities under Council's Waste Management and Minimisation Plan (WMMP) 2023–2029. For projects and initiatives delivered under the WMMP, reporting is provided directly to the relevant Hutt City Council committee and to the Wellington Region Joint WMMP Committee. There is no standing internal management reporting framework that reports to Council's Corporate Leadership Team, aside from occasional project specific decision papers where required. For the past 12 months, reporting to Hutt City Council has included a dashboard providing project status updates.

We also note that our response does not include reports provided to the Wellington Region Joint WMMP Committee, as these are publicly available. Reports prior to October 2025 can be accessed via the Wellington City Council website, and reports from October 2025 onwards are available via the Porirua City Council website.

In response to your request, please refer to **Appendix 1** below, which details the documents in scope of your request and Council's decision on its release.

Please note, some information has been withheld under the following provisions of the LGOIMA:

- Section 7(2)(a), to protect the privacy of natural persons, and
- Section 7(2)(b)(ii), to protect information where making it available would be likely to unreasonably prejudice the commercial position of the person who supplied, or is the subject of, the information.

Council has considered whether the public interest in release of the withheld information outweighs the need to withhold it and has concluded that it does not.

You have the right to seek an investigation and review by the Ombudsman of this response. Information about how to make a complaint is available at: [Office of the Ombudsman - Complaints](#), or freephone 0800 802 602.

Please note that this response to your information request may be published on Hutt City Council's website: [Proactive releases - Hutt City Council](#).

Ngā mihi nui



Rebekah van der Splinter

Senior Advisor, Official Information and Privacy

Appendix 1: Documents for release

Number	Date	Document Type	Title/Subject Line	Redaction Grounds
1	4 July 2023	Committee excerpt	Update on Organic Collection and Processing Options	Released to you in full. This paper, including any links referenced within it, is available online at: <u>Agenda of Climate Change and Sustainability Committee - Tuesday, 4 July 2023.</u>
2	4 July 2023	Committee excerpt	Update on Various Solid Waste and Waste Minimisation Matters	Released to you in full. This paper, including any links referenced within it, is available online at: <u>Agenda of Climate Change and Sustainability Committee - Tuesday, 4 July 2023.</u>
3	5 September 2023	Committee excerpt	Update on Various Solid Waste and Waste Minimisation Matters	Released to you in full. This paper, including any links referenced within it, is available online at: <u>Agenda of Climate Change and Sustainability Committee - Tuesday, 5 September 2023.</u>

Number	Date	Document Type	Title/Subject Line	Redaction Grounds
4	5 September 2023	Committee excerpt	Update on Organic Waste Collection and Processing Service	Some information has been withheld under s7(2)(a). This paper, including any links referenced within it, is available online at: <u>Agenda of Climate Change and Sustainability Committee - Tuesday, 5 September 2023.</u>
5	14 November 2023	Committee excerpt	Organics Business Case	Some information has been withheld under s7(2)(a). This paper, including any links referenced within it, is available online at: <u>Agenda of Climate Change and Sustainability Committee - Tuesday, 14 November 2023.</u>
6	14 November 2023	Committee excerpt	Update on solid waste and waste minimisation matters	Released to you in full. This paper, including any links referenced within it, is available online at: <u>Agenda of Climate Change and Sustainability Committee - Tuesday, 14 November 2023.</u>

Number	Date	Document Type	Title/Subject Line	Redaction Grounds
7	20 February 2024	Committee excerpt	Update on solid waste and waste minimisation matters	Released to you in full. This paper, including any links referenced within it, is available online at: Agenda of Climate Change and Sustainability Committee - Tuesday, 20 February 2024.
8	23 April 2024	Committee excerpt	Update on solid waste and waste minimisation matters	Released to you in full. This paper, including any links referenced within it, is available online at: Agenda of Climate Change and Sustainability Committee - Tuesday, 23 April 2024.
9	2 July 2024	Committee excerpt	Update on solid waste and waste minimisation matters	Released to you in full. This paper, including any links referenced within it, is available online at: Agenda of Climate Change and Sustainability Committee - Tuesday, 2 July 2024.

Number	Date	Document Type	Title/Subject Line	Redaction Grounds
10	20 August 2024	Spreadsheet	Waste minimisation reserve balance and levy reconciliation 22–23	Some information has been withheld under s7(2)(a) and s7(2)(b)(ii).
11	4 September 2024	Committee excerpt	Update on solid waste and waste minimisation matters	Released to you in full. This paper, including any links referenced within it, is available online at: <u>Agenda of Climate Change and Sustainability Committee – Wednesday, 4 September 2024</u>
12	12 November 2024	Committee excerpt	Update on solid waste and waste minimisation matters	Released to you in full. This paper, including any links referenced within it, is available online at: <u>Agenda of Climate Change and Sustainability Committee – Tuesday, 12 November 2024.</u>

Number	Date	Document Type	Title/Subject Line	Redaction Grounds
13	25 February 2025	Committee excerpt	Update on Solid Waste and Waste Minimisation matters	Released to you in full. This paper, including any links referenced within it, is available online at: <u>Agenda of Climate Change and Sustainability Committee - Tuesday, 25 February 2025.</u>
14	27 June 2025	Proposal	Asbestos destruction trial	Some information has been withheld under s7(2)(a).
15	30 June 2025	Memorandum	Funding for EDL Asbestos Treatment Pilot at the Silverstream Landfill	Some information has been withheld under s7(2)(a).
16	2 July 2025	Committee excerpt	Update on Waste and Resource Recovery Matters	Released to you in full. This paper, including any links referenced within it, is available online at: <u>Agenda of Climate Change and Sustainability Committee - Wednesday, 2 July 2025.</u>
17	14 July 2025	Addendum to memorandum	Further information re EDL pilot	Released to you in full.
18	14 July 2025	Appendix to memorandum	Silverstream Asbestos Pilot Trial Funding Risks	Released to you in full.

Number	Date	Document Type	Title/Subject Line	Redaction Grounds
19	28 July 2025	Memorandum	Waste Levy Funding Contribution For Asbestos Treatment Demonstration At Silverstream Landfill	Some information has been withheld under s7(2)(a).
20	3 September 2025	Committee excerpt	Update on solid waste management and minimisation work streams	Released to you in full. This paper, including any links referenced within it, is available online at: Agenda of Climate Change and Sustainability Committee – Wednesday, 3 September 2025.
21	23 October 2025	Briefing note	EDL trial approval	Some information has been withheld under s7(2)(a) and s7(2)(b)(ii).
22	5 March 2026	Committee excerpt	Quarterly report on the Silverstream Landfill and update on solid waste infrastructure and services	Released to you in full. This paper, including any links referenced within it, is available online at: Agenda of Infrastructure and Regulatory Committee – Thursday, 5 March 2026.

Number	Date	Document Type	Title/Subject Line	Redaction Grounds
23	7 May 2026	Committee excerpt	Silverstream Landfill and Solid Waste Management and Minimisation Update	Released to you in full. This paper, including any links referenced within it, is available online at: <u>Agenda of Infrastructure and Regulatory Committee – Thursday, 7 May 2026.</u>
24	27 May 2026	Dashboard	Silverstream Landfill Diversion	Released to you in full.
25	27 May 2026	Overview	Battery recycling data and rollout dates	Released to you in full.
26	Unknown	Spreadsheet	Waste minimisation reserve balance and levy reconciliation 24–25	Some information has been withheld under s7(2)(a) and s7(2)(b)(ii).



Climate Change and Sustainability Committee

16 June 2023

Report no: CCASC2023/3/204

Update on Organic Collection and Processing Options

Purpose of Report

1. This report informs Council about the various organic waste collection and processing options that are being investigated as part of the forthcoming Business Case on the matter.

Recommendations

That the Committee:

- (1) notes the various organic waste collection and processing options that are being investigated;
- (2) notes the considerations and criteria that will be used for an in-depth assessment of a short list of options; and
- (3) notes that the forthcoming business case with recommendations will be presented at the Committee's meeting on 5 September 2023.

Background

2. In 2022, officers commenced work on a project to investigate options for managing food and green (organic) waste in the future (refer to report no: CCASC2022/3/146 from 14 July 2022, page 27).
3. The project aims to assess the different options for collecting and processing organic waste from both businesses and households and is being done in collaboration with the Porirua and Wellington City Councils.

Discussion

4. When organic waste breaks down in anaerobic environments (where there is no oxygen) such as landfills it creates leachate and the greenhouse gases, carbon dioxide and methane.

5. Although both these gases contribute to climate change, methane is approximately 28 times more harmful than carbon dioxide due to its inherent molecular structure.
6. Landfill gas makes up 4% of New Zealand's overall greenhouse emissions and 7% of Lower Hutt's greenhouse emissions. Organic waste is expected to be banned from New Zealand landfills by 2030 due to its contribution to greenhouse gas generation and associated impacts.
7. As well as reducing greenhouse gas emissions, diverting organic waste from landfill will have the following co-benefits:
 - Extending the lifespan of existing landfills in the Wellington Region.
 - Reducing the amount of Waste Levy paid either directly or indirectly by residents, businesses and other organisations.
 - Organic nutrients can be used to sustain ecosystems and kept in circulation for longer.
 - Provision of new services and facilities for the community, businesses and other organisations
 - Programmes and other educational opportunities to promote waste minimisation.
8. One of the six guiding principles of the recently released Te Rautaki Para | Waste Strategy 2023 (The New Zealand Waste Strategy) is to apply the waste hierarchy preferences to how we manage materials.
9. The hierarchy included in Te Rautaki Para is separated into two sections – (a) those options for dealing with end-of-life materials that occur prior to their disposal, and (b) those options for dealing with end-of-life materials that occur after their disposal.
10. Options further up the hierarchy tend to provide the best overall social, economic and environmental benefits. From a Council perspective, focusing on the top of the hierarchy - i.e. the options that avoid generating garden and/or food waste altogether - provides the best outcomes.
11. Council is committed to supporting local and national campaigns that emphasise the 'reduce' option in the hierarchy and will continue this work in parallel with any plans for an organic waste collection and processing service.

Project Objectives

12. The following project objectives for an organic waste collection and processing service for all three councils have been developed by the joint project team:
 - Residents and businesses have access to appropriate organic waste material recovery options.

- Deliver affordable and cost-effective organic materials recovery for residents and businesses.
- Reduce the need for residual waste disposal.
- Deliver a 40% reduction in biogenic methane greenhouse gas emissions by 2035 (relative to 2017 levels) as stipulated in the 2022 Emission Reduction Plan:
(<https://environment.govt.nz/publications/aotearoa-new-zealands-first-emissions-reduction-plan/waste/>)

Options

13. A wide range of options for collecting and processing organic waste from across all three councils have been considered. The options listed here can effectively manage city-wide volumes of organic waste from residents, businesses and other organisations.
14. On 14 June 2023, Council was briefed on the options as well as the forthcoming Business Case and Ministry for the Environment Waste Minimisation Fund application.

Collections:

15. When considering the collection of organic waste: (a) the receptacle used, (b) the method of collection and (c) the capture of target materials are all important criteria that need to be considered. These criteria are in turn influenced by factors such as collection frequency and the anticipated type/quantity of organic waste.
16. In New Zealand and overseas, the most common receptacles used across kerbside collections are the ubiquitous 'wheelie' bins ranging from 23 litres to 240 litres. These bins are predominantly collected via semi or fully automated side loader vehicles, but smaller bins may be manually emptied into the vehicles.
17. Collection frequencies will vary depending on (a) the type of organic waste being collected, for example food scraps, green waste etc. and (b) the nature of the source, for example households, cafes/restaurants etc.
18. In some cases, an organic waste collection service may be offset by a reduced collection frequency for general waste.

Processing:

19. Any processing system needs to (a) deliver a value-added product, (b) minimise overall greenhouse gas emissions, and (c) provide a significant diversion from landfill.
20. An ideal site would have to be close to population centres to limit transport costs and related emissions. Given the nature of materials being handled the ideal site will also have substantial separation from sensitive land uses such as residential housing (including lifestyle blocks) and commercial activity.

21. Suitable locations for composting operations need careful consideration. For example, vermicomposting requires substantial land to provide for the extended processing times.
22. A suitable site will also have to consider greenhouse gas emissions. The majority of the processing options have low net emissions and emissions that are produced can be offset by either avoiding landfill disposal of organic material, composting or energy use of biogas. Emissions from the transportation of collected materials and construction/ongoing work on processing facilities will be heavily weighted in assessing each processing option.
23. Where materials are composted, securing a bulking agent is also potentially a challenge. This means that maximising the capture of green waste and other potential bulking material (untreated timber, sawdust, bark) may be important. The available data suggest that green waste alone will not provide the bulking material required if 50% - 60% of food waste is successfully captured. There is the potential that bulking material may need to be imported from outside the Wellington region. This factor will also weigh heavily on the potential processing outcome.
24. Each processing option has its own pros and cons. The likes of windrow and aerated static pile composting both have low capital cost but require more land than in vessel operations. These processing types are also exposed to the outside environment meaning there is a high chance of odour issues and nutrient run off. Each processing technology requires a detailed analysis as to its suitability for the region.
25. The key criteria for processing options are tabled below.

Criteria	Definition
Technical risk	The level of risk (High, Medium or Low risk) associated with the solution based on track record (NZ and international), complexity and supplier capability.
Flexibility	The ability (High, Medium or Low flexibility) of the solution to adjust to changes in materials type, quantity, markets and policy framework.
Markets	The level of confidence (High, Medium or Low market risk) in markets for the output(s) from the solution.
Capital cost	High level capital cost requirements (High, Medium or Low capital cost) for the solution.
Affordability (Council, ratepayers, businesses)	Affordability (High, Medium or Low Cost) of the solution based on capital and ongoing operational costs reflected in user charges or other funding arrangements.
Diversion from landfill	The amount of new diversion of organic material from landfill disposal (High, Medium or Low) diversion.
Environmental impacts	The risk of adverse environmental impact (air quality, water impacts) for a well designed and operated solution (High, Medium, Low impact).
Greenhouse gas emissions	The anticipated net greenhouse gas emissions associated with the solution (High, Medium or Low net emissions). Presented to compare options rather than provide an absolute assessment of emissions associated with each option.
Cultural impacts	Definition to be agreed with Iwi.

Conclusion and Next Steps

26. There is significant complexity in establishing a regional food waste collection service and associated processing facility, and we are just starting out on the journey together with our fellow councils. The Options Report from Tonkin & Taylor will be finalised in the coming weeks and the Business Case will proceed shortly thereafter. Funding to support the establishment of the preferred option will be sought from Ministry for the Environment's Waste Minimisation Fund.

Climate Change Impact and Considerations

27. The matters addressed in this report have been considered in accordance with the process set out in Council's Climate Change Considerations Guide.
28. Net emissions will have a considerable weighting when assessing any options for collecting and processing organic waste.
29. Landfill emissions currently account for 7% of Lower Hutt's total emissions. Removing organic waste from the landfill will reduce Lower Hutt's Landfill and total emissions.
30. The objectives of this project have been developed in alignment with the Te Rautaki Para | Waste Strategy and Emissions Reduction Plan 2022.

Consultation

31. Not Applicable

Legal Considerations

32. Not Applicable

Financial Considerations

33. Not Applicable

Appendices

There are no appendices for this report.

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Approved By: Alison Geddes
Director Environment and Sustainability



Climate Change and Sustainability Committee

16 June 2023

Report no: CCASC2023/3/205

Update on Various Solid Waste and Waste Minimisation Matters

Purpose of Report

1. To provide the Committee with an update on various solid waste management and minimisation matters.

Recommendation

That the Committee notes the update on various solid waste management and minimisation matters.

Background

2. This report consolidates information on the status of a range of Council solid waste management and minimisation initiatives.
3. Detailed and regular information on the ongoing development, operation and performance of the Silverstream Landfill is covered in a separate report to the Hutt Valley Services Committee.

Discussion

Wellington Region Waste Management and Minimisation Plan (WMMP)

4. In 2022, Council agreed to review the 2017-23 WMMP. As the work is done in collaboration with other territorial authorities (TAs) in the Wellington region, progress on this work is reported via the Wellington Region Waste Management and Minimisation Joint Committee (the Joint Committee).
5. The most recent update on the work of the Joint Committee from March 2023 is available at <https://wellington.govt.nz/your-council/meetings/committees/wellington-region-waste-management-and-minimisation-plan-joint-committee/2023/03/06>
6. Officers from Upper Hutt and Hutt City Councils ran joint workshops for Hutt Valley businesses, non-governmental organisations and community

groups throughout the week of 17-21 April 2023. The purpose of these workshops was to get an understanding of the current waste related barriers and opportunities as well as any potential actions that could be included in our local action plans. The TA's consultant Beca Ltd, also held workshops in February to cover the overall strategic direction of the plan and regional action plans.

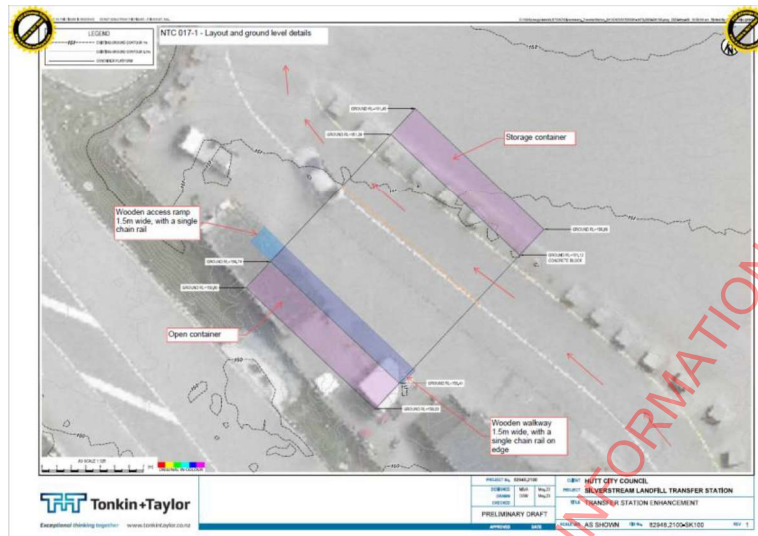
7. A separate workshop for Mana Whenua was hosted by Hutt City Council on 23 June 2023, with an external Te Ao Māori facilitator. This hui was a chance for our local iwi to shape the general direction of the WMMP as well as the proposed local and regional actions before they go out for public consultation.
8. A briefing session was held on 14 June 2023. The purpose of the briefing was to socialise the key themes of the WMMP and the results of the Local Action Plans and Beca workshops.
9. The first draft version of the WMMP, was received in early June. Officers from each of the eight councils provided feedback to Beca, with the final draft expected in late June/early July.
10. A Workshop on the draft WMMP was held on 26 June 2023 for the Joint Committee. The purpose of this workshop was to provide feedback on the proposed visions, objectives and regional actions, before public consultation.
11. Authority to delegate responsibility for the WMMP consultation process to the Joint Committee, was sought and accepted by Council's Climate Change and Sustainability Committee on 2 May 2023.
12. Consultation responsibilities sit with Wellington City Council as the host of the Joint Committee. However, a working group has been created which will ensure Wellington has the resources to undertake this work. This is likely to involve temporary secondments of Hutt City Council waste staff to Wellington City Council.
13. The final draft WMMP, will be taken to the Joint Committee meeting on 24 July 2023 requesting approval for public consultation. Public consultation is expected to run from 31 July to 1 September 2023, with the new WMMP expected to be in place in late 2023.

Resource recovery changes at Silverstream transfer station

Performance of recycling voucher scheme

14. The implementation of a new discount voucher scheme was launched in late March 2023. This scheme has been received well by both landfill users and staff, with over 65 vouchers issued and redeemed. Continued communications for this scheme and transfer station upgrades are planned throughout the next six months.
15. Plans for the construction of an improved shelter for the Earthlink drop-off have been finalised. This will greatly increase the ease and safety of donating recoverable materials. Domestic landfill users will be able to drive through

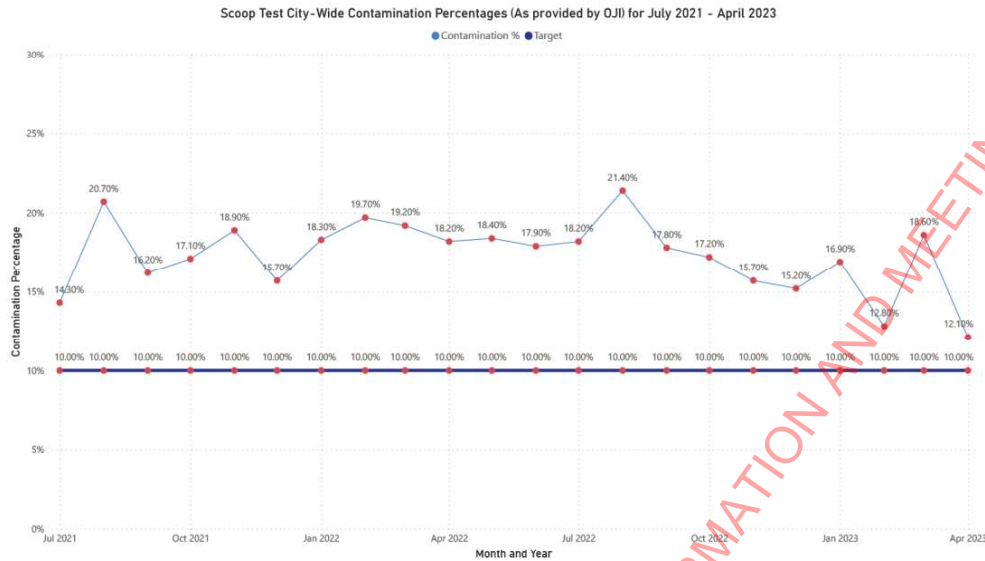
this new covered area and drop their items at the relevant station within the structure. Any non-recoverable refuse can then be driven around to the transfer station site. Waste Management is preparing quotes on the final plans and once approved, construction will begin.



Kerbside Rubbish, Recycling and Green Waste bin service

City-wide recycling contamination and behaviour change

16. Council has continued with the multi-pronged approach to combat contamination which includes recycling ambassadors inspecting and stickering bins, a city-wide behaviour change campaign and a three-strikes approach for the removal of bins where households repeatedly contaminate their recycling. Over 90 recycling bins have been removed under this scheme since its implementation in November 2023. Significant behaviour change has been seen through the stickering system with only 15% of properties going on to receive a second red sticker after receiving their first.
17. There is evidence this is achieving promising results, with a downward trend of contamination in 2023 including two months below 13% (February 12.8% and April 12.1%). While this downward trend is positive news, we recognise that ongoing work is still needed to maintain this and address potential spikes (e.g., March 2023 18.6%).



Too good to Waste webpage refresh

18. Work is currently being completed by officers and an external marketing and communications agency to refresh the current <https://www.toogoodtowaste.co.nz> webpage. The aim of this work is to update this webpage to become an aspirational destination for Lower Hutt residents to learn about waste minimisation and share the work that our community is doing in this space, as well as housing assets and collateral from the behaviour change campaign. This work is expected to go live in August/September 2023.

Service improvements

19. In early 2023, Council implemented a new ticketing system for managing residents' solid waste enquiries and requests for service changes, such as changing bin sizes or reporting missed collections.
20. The ticketing system (Zendesk) has allowed a significant improvement in the management and workflow of these types of queries. Real time updates (as notifications via email) are sent to the residents informing them of their ticket status. Communication between all stakeholders and reporting is more efficient since the implementation.

Solid Waste Management and Minimisation Bylaw 2021

Minimising Waste at Events-

21. Officers have assessed and accepted waste plans throughout the summer event seasons after implementing a requirement for waste management and minimisation plans from event organisers. Officers are completing ongoing work for this, engaging with event managers and continuing regional work around general education and communications.

MUDs Process Review

22. To accommodate the increase in multi-unit developments (MUDs), the solid waste team will undergo a MUDs process review to ensure that a suitable process is in place to manage the waste and recycling needs of all current and upcoming MUDs.

Litter Reduction

23. Sustainable Coastlines is a not-for-profit organisation with the aim of reducing plastic pollution and other litter. It operates nationwide, and its work is focused on education and litter data collection. Through its Litter Intelligence programme, Sustainable Coastlines started regularly monitoring sites across New Zealand in 2018.
24. A contract with Sustainable coastlines was signed in April 2023 to undertake a three-year programme that involves monthly litter monitoring at three sample sites and clean-ups of the wider Petone Beach area. The data collected from this work can help us better understand the scale of the problem and litter composition and help us identify possible solutions.

Illegal Dumping Behaviour Change

25. Council has been approached by Keep New Zealand Beautiful (KNZB) to support a litter behaviour change campaign in the Hutt Valley in partnership with Keep Hutt Valley Beautiful. Funding from the Ministry for the Environment is also a possibility.
26. Council is currently spending in the range of \$3000- \$5000 per month on illegal dumping and has reported over 364 litter dumpings over the past 12 months.
27. While this spending is within the normal range and not over budget, reducing this behaviour will result in a saving of costs to Council and have clear benefits to the environment.
28. Illegal dumping and littering have proven to be a persistent problem and officers have offered to support the potential behaviour change campaign as much as possible. We have provided statistics and information about the costs to Council of littering and illegal dumping to support the KNZB conversations with MFE and will continue to support the project if it goes forward.
29. Should this campaign go forward, a further update will be provided to the Committee.

Climate Change Impact and Considerations

30. The matters addressed in this report have been considered in accordance with the process set out in Council's Climate Change Considerations Guide.
31. Minimising waste, diverting recyclables from landfill and recovering reusable materials all contribute to a more sustainable economy. These

activities reduce the need to extract further resources from the environment and the associated energy use in doing so.

Consultation

32. Not applicable

Legal Considerations

33. Not applicable

Financial Considerations

34. No are no current financial considerations in terms of decisions for Council, however the following items have potential financial impacts:

- a) Improvements to the Earthlink resource recovery facility has the potential to divert an increased amount of material from landfill. Reduction in waste to landfill involves a short term decrease in landfill revenue to Council but a long term reduction in Capital Expenditure due to extending the capacity and life of the Landfill.
- b) Reducing kerbside recycling contamination has a direct impact on the cost under contract for this service as any contamination rates over 10% incur penalty fees for Council.
- c) A reduction in illegal dumping and littering will reduce the cost to Council of collecting and disposing of this waste.

Appendices

There are no appendices for this report.

Author: Geoff Roberts
Manager Waste Minimisation

Approved By: Alison Geddes
Director Environment and Sustainability



Climate Change and Sustainability Committee

04 August 2023

Report no: CCASC2023/4/269

Update on Various Solid Waste and Waste Minimisation Matters

Purpose of Report

1. To provide the Committee with an update on various solid waste management and minimisation matters.

Recommendation

That the Committee notes the update on various solid waste management and minimisation matters.

Background

2. This report consolidates information on the status of a range of Council solid waste management and minimisation initiatives.
3. Detailed and regular information on the ongoing development, operation and performance of the Silverstream Landfill is covered in a separate report to the Hutt Valley Services Committee. The latest report from May 2023 is available at http://infocouncil.huttcity.govt.nz/Open/2023/05/HVSC_05052023_AGN_3141_AT.PDF (page 48).

Wellington Region Waste Management and Minimisation Plan (WMMP)

4. In 2022, Council agreed to review the 2017-23 WMMP. As the work is done in collaboration with other territorial authorities (TAs) in the Wellington region, progress on this work is reported via the Wellington Region Waste Management and Minimisation Joint Committee (the Joint Committee).
5. The most recent update on the work of the Joint Committee from July 2023 is available at <https://wellington.govt.nz/your-council/meetings/committees/wellington-region-waste-management-and-minimisation-plan-joint-committee/2023/07/24>

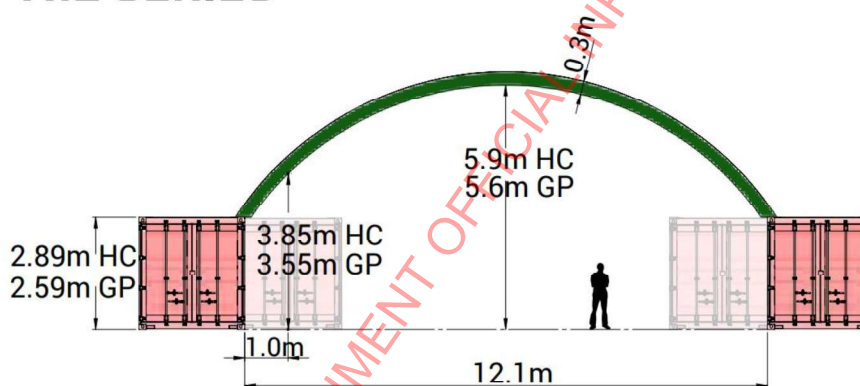
6. The draft WMMP was approved for public consultation by the Joint Committee on 24 July 2023. Public consultation was open between 31 July and 1 September 2023.
7. Consultation responsibilities sit with Wellington City Council as the host of the Joint Committee. However, a working group (consultation delivery team) has been created with members of each council and they will work on the summary of submissions and work with project leads to incorporate feedback into the final plan.
8. Submissions during this time could be submitted online via the <https://www.lesswastegreaterplace.co.nz/> joint webpage or on a printed form at HCC hubs and libraries. Two drop in-sessions have also been offered at the Naenae and War Memorial libraries, albeit no residents took up this option.
9. Work is now under way to summarise submissions and reflect feedback in the revised WMMP. The WMMP is expected to be finalised and published later this year, subject to approval by the participating Councils, including Hutt City Council.

Resource recovery changes at Silverstream transfer station

10. The project to construct a new resource recovery shelter for Earthlink is well underway with the containers and shelter materials now on site awaiting assembly.
11. While there have been unexpected delays due to geotechnical issues requiring additional engineering of the foundations, officers are aiming to have the structure completed by no later than October 2023.
12. This will greatly increase the ease and safety of donating recoverable materials. Domestic landfill users will be able to drive through this new covered area and drop their items at the relevant station within the structure, and the discount voucher is available to users depending on the type and amount of items diverted. Any non-recoverable refuse can then be driven around to the transfer station site.



A12 SERIES

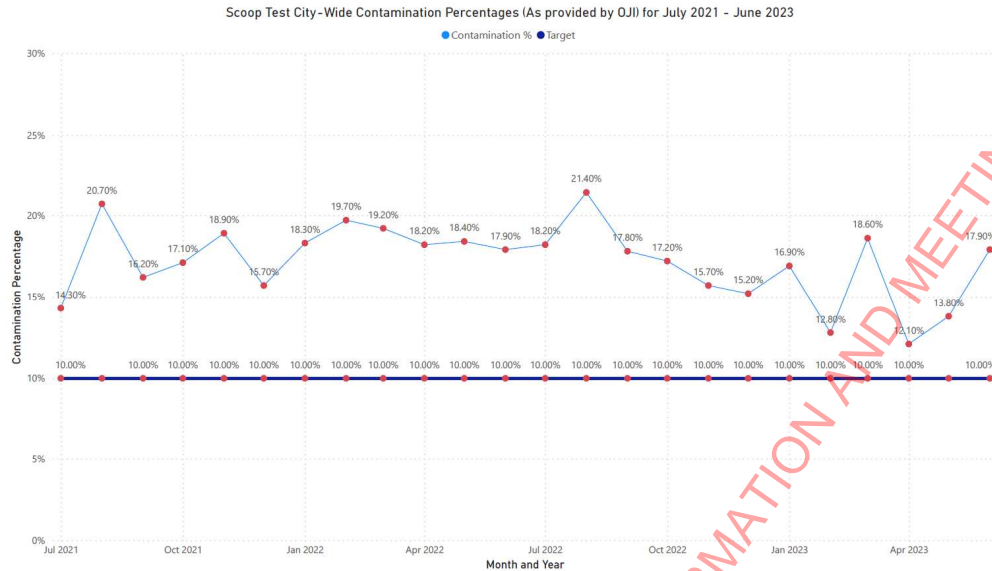


13. While these works are being completed, officers have begun working with Waste Management New Zealand (WMNZ) on establishing construction and demolition (C&D) waste diversion opportunities at Silverstream transfer station. While details are yet to be confirmed, this will likely involve bins for self-sorting certain C&D waste streams, such as wood waste and plasterboard, to be in place before the end of 2023.

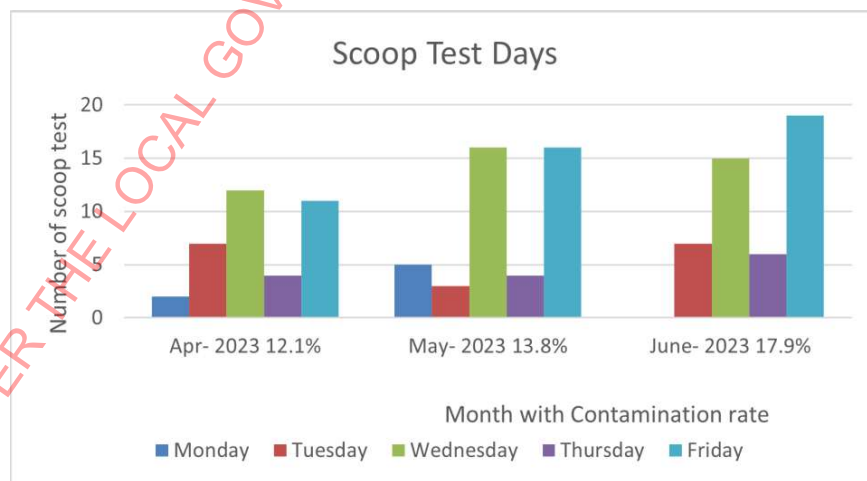
Kerbside Rubbish, Recycling and Green Waste bin service

City-wide recycling contamination and behaviour change

14. Recycling contamination rates remain a key challenge for the solid waste team. While both April and May 2023 continued a positive trend with 12.1% and 13.8% respectively, we again experienced a spike in June 2023. This indicates that more work is required to maintain a stable downward trend in contamination rates.



15. Council has continued with the multi-pronged approach to combat contamination, which includes recycling ambassadors inspecting and stickering bins, a city-wide behaviour change campaign and a process for the removal of bins where households repeatedly contaminate their recycling. About 130 recycling bins have been removed under this scheme since its implementation in November 2023.
16. In response to the contamination rate spike in June 2023, we reviewed the process for determining contamination rates and identified one potentially relevant factor was conducting scoop tests mainly on Wednesdays and Fridays (see figure below). We addressed this concern with our contractor and have requested a more even distribution of scoop tests throughout the entire week.



Too good to Waste webpage refresh

17. As part of the behaviour change campaign, the [Too Good Too Waste portal](#) has been updated, and the refreshed page went live in early August 2023.

18. This portal now not only holds information on the kerbside collections but also resources and advice for residents to help minimise waste, reduce contamination, a kids zone, and a page dedicated to sharing the great work organisations and individuals are already doing to minimise waste.
19. Work is being done by officers to promote this refresh both online on Council social channels and in print in hubs and libraries.

Regional Biosolids Strategy

20. Biosolids are a particularly problematic waste stream, and their handling and disposal have a large emissions impact. To understand how we can best reduce this impact, Council has partnered with Wellington Water Limited to fund a research project on biosolids.
21. Mott Macdonald are completing this work to identify and evaluate biosolid reuse pathways with a particular focus on recovering value from this waste stream. Officers are awaiting the final report.

Campaign to reduce litter and illegal dumping behaviour

22. Officers are scoping a city-wide anti-litter and illegal dumping campaign that could potentially consist of multiple projects running in parallel. A key aspect of this project is also to improve data we collect regarding litter and illegal dumping.
23. A stakeholder engagement workshop is scheduled to be hosted by Hutt City Council in October 2023, to test and share ideas with key stakeholders (such as Keep New Zealand Beautiful).
24. Note that Sustainable Coastlines is running another Petone Beach Cleanup event that will take place in October 2023. This will see an increase in promotion on Council platforms and will be attended by council officers to show ongoing support for this important work.

Climate Change Impact and Considerations

25. The matters addressed in this report have been considered in accordance with the process set out in Council's Climate Change Considerations Guide.
26. Minimising waste, diverting recyclables from landfill and recovering reusable materials (such as the potential addition of C&D diversion opportunities, diverting biosolids, etc) contribute to a more circular economy. These activities reduce the need to extract further resources from the environment and the associated energy use in doing so.
27. Improving the management and disposal of biosolids has the potential to reduce greenhouse gas emissions from this waste stream.

Consultation

28. Not applicable

Legal Considerations

29. Not applicable

Financial Considerations

30. There are no current financial considerations in terms of decisions for Council, however the following items have potential financial impacts in the future:
- a. Improvements to the Silverstream transfer station (eg Earthlink resource recovery drop off, potential addition of C&D diversion opportunities) and potential alternative pathways for biosolids have the potential to divert an increased amount of material from Silverstream landfill. A reduction in waste to landfill involves a short-term decrease in landfill revenue to Council but a long term reduction in capital expenditure due to extending the capacity and life of the landfill.
 - b. Reducing kerbside recycling contamination has a direct benefit on the cost under contract for this service as any contamination rates under 10% do not incur penalty fees for Council.
 - c. A reduction in illegal dumping and littering would reduce the cost to Council to collect and dispose of this waste.

Appendices

There are no appendices for this report.

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Acting Director Environment and Sustainability



Climate Change and Sustainability Committee

08 August 2023

Report no: CCASC2023/4/266

Update on Organic Waste Collection and Processing Service

Purpose of Report

1. The purpose of this report is to update councillors on the development of an intra-regional organic waste collection and processing service.

Recommendations

That the Committee:

- (1) notes the update on progress to develop a business case regarding the management, collection and processing of green and food organic waste; and
- (2) notes the Options Report attached as Appendix 1 to the report.

For the reason:

The Options Report identifies the options and estimated costs associated with a range of collection and processing possibilities for organic waste in the Lower Hutt, Porirua and Wellington City areas.

Background

2. In April 2022, officers commenced work on a project to investigate options for managing green and food organic waste in the future (refer to report no: [CCASC2022/3/146 from 14 July 2022](#), page 27).
3. The project will enable Council to have a clear understanding of the different options for managing, collecting and processing green and food organic waste from both businesses and households, and is being undertaken in collaboration with the Porirua and Wellington City Councils.
4. Tonkin and Taylor Ltd were selected to help the councils to undertake the analysis, and to develop the forthcoming Business Case.

Organic Waste

5. When food and green waste (and other organic waste) breaks down anaerobically in landfills, it creates methane, a powerful greenhouse gas.
6. Landfill gas makes up 4% of New Zealand's overall greenhouse gas emissions and 7% of Lower Hutt's greenhouse gas emissions. Fugitive gas from Silverstream Landfill alone makes up over 30% of Council's organisational emissions.
7. Diverting more organic waste from landfill can have the following co-benefits:
 - Extending the lifespan of existing landfills in the Wellington Region.
 - Reducing emissions associated with the decomposition of that organic waste in existing landfills.
 - Organic nutrients can be used to sustain ecosystems and are therefore kept in circulation for longer.
 - Economic opportunities from the provision of new services and facilities for the community, businesses and other organisations.

The New Zealand Waste Strategy

8. The recently released Te Rautaki Para Waste Strategy 2023 highlights the need to apply the waste hierarchy to decisions involving the management of materials.
9. The hierarchy provides options for dealing with end-of-life materials prior to and after their disposal.
10. Options further up in the waste hierarchy tend to lead to better overall social, economic and environmental benefits as they focus on reducing the amount of organic waste generated.
11. With regard to the business case work underway, the Government has flagged that it wants to reduce the amount of waste that ends up in landfills and associated emissions ([refer Waste Strategy, page 25](#)), and it has set a target that by 2030, food scrap collections will be available to households in urban areas.

Business case progress

12. Following a [presentation to Council on 14 June 2023](#), work has progressed to finalise an Options Report, enclosed as Appendix 1 to the report. This report was originally scheduled to be completed by May 2023, but the project is more complex than what was originally anticipated, and we had some unexpected staff changes.
13. The Options report is a key deliverable within the overall project to develop a Business Case that assesses the benefits and costs of options for the

collection and processing of green and food organic materials from residents and businesses in Porirua, Lower Hutt and Wellington.

14. The Options Report outlines the:

- national and regional policy context;
- current situation, including existing waste management services, the quantity of green and food organic waste and future projections and a summary of the targeted stakeholder feedback;
- collection options available, including information on bin types, collection vehicles, potential frequency and emissions associated with those (Table 6.1 on page 32, and Appendix C);
- processing options available, including information on suitable feedstocks, estimated costs and potential emission reductions (Table 6.2 and Table 6.3 on pages 33 and 34).

15. There are a range of considerations when assessing options. This includes factors such as technical risk, how flexible the chosen approach is to volume, quality and range of feedstocks, whether markets exist for the end-products, affordability, environmental impacts and greenhouse gas emissions.

16. In addition, while it is very important to consider the markets available once green and/or food waste has been processed, decisions on the preferred collection methodology also drive what processing technologies can be utilised. For example, food waste processed via an open-windrow composting system is likely to be odorous, and it may not be feasible to obtain consent.

17. Work is currently underway on the Business Case. A briefing on the draft business case and shortlisted options to Council has been scheduled for 27 September 2023. The finalised Business Case is scheduled to be reported back to the Committee on 14 November 2023.

Climate Change Impact and Considerations

18. The work regarding options to manage green and food organic waste directly aligns with Council's desire to reduce emissions at Silverstream Landfill, as it could reduce the amount of organic waste disposed. Details regarding costs and benefits (including reductions in emissions) will be included in the forthcoming Business Case.

Consultation

19. As part of the project, targeted stakeholder engagement was undertaken in the second half of 2022. This has informed the options report (eg to better understand markets for the potential end-products, such as compost).

Legal Considerations

20. There are no legal considerations.

Financial Considerations

21. Note that the draft Business Case is scheduled to be presented to Council later in September 2023, and will have costs and benefits in regard to the shortlisted options, including the status quo.
22. Officers will report back on the final business case in November, and present recommendations to the Committee. The Committee will be asked to make decisions in principle regarding the Long Term Plan, noting that all requests for new or increased budgets will be subject to trade-off conversations.
23. Note that HCC, in collaboration with Porirua and Wellington, have submitted a joint funding application to the Ministry for the Environment, regarding funding support toward the roll-out of a potential green and food organics collection service. If successful, this could secure up to 75% of the roll-out costs (eg bins).

Appendices

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Acting Director Environment and Sustainability

REPORT



Organic Options Report

Prepared for

Porirua City Council, Hutt City Council, Wellington City Council

Prepared by

Tonkin & Taylor Ltd

Date

August 2023

Job Number

1020245 v1.3



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sustain a better world**

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Document control

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November 2022	0.1	Table of contents for review	s7(2)(a)		
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July 2023	1.2	Updates following further Council comments			
August 2023	1.3	Updates following further Council comments			

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1 copy

Tonkin & Taylor Ltd (FILE)

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Executive Summary

This report summarises options for collections of organic materials for Porirua, Hutt and Wellington City Councils. This report sits within a larger project where the overall project aim is to develop a Business Case that defines, assesses and recommends an option/s for the collection of organic materials from residents and businesses in Porirua, Lower Hutt and Wellington.

The project objectives include:

- Residents and businesses have access to appropriate organic material recovery options.
- Deliver affordable and cost-effective organic materials recovery for residents and businesses.
- Reduce the need for residual waste disposal.
- Deliver a 40% reduction in biogenic methane greenhouse gas emissions by 2035.

When organic material breaks down in an anaerobic environment, such as a landfill, it creates greenhouse gas emissions and leachate. Greenhouse gases created from the breakdown of organic material include carbon dioxide and methane. These gases contribute to climate change (specifically methane given its global warming potential compared to carbon dioxide). Central Government has developed policy interventions in response to these climate impacts including the waste minimisation fund's focus on infrastructure and enabling systems to reduce landfill emissions from organic waste and the strategic direction set out in Te rautaki para I Waste strategy. These policy signals are considered to be key drivers for this project.

The focus of this report is on food waste (including material from hospitality and food processing) and green waste. Only Hutt City Council provides a kerbside collection service that diverts organic material from landfill (an opt-in green waste only collection). Therefore, there is an opportunity for all of the Councils to divert a higher quantity of organic material from landfill.

The approach to this project has firstly focused on collections and providing services to residents and collating enough information to inform the potential processing technology. This is the first stage and focuses on materials to be collected and thus the available collection methods. Once the collection approach is defined, processing options can be considered. Again the focus is on identifying an approach including consideration of processing technologies and potential locations.

The collection options available to the councils based on target materials are:

- Green waste only.
- Food waste only.
- A combined green and food waste collection service.
- Collection of both green waste and food waste, but via separate collections.

The target materials streams are suitable for a range of processing approaches. These include composting (open windrow or in-vessel), vermicomposting and anaerobic digestion. Each processing technology has advantages and disadvantages that are noted in this report.

The focus of collections is for residents, however commercial food and green waste capture is also being considered. Where processing is established for household materials, this will also be able to accept materials from commercial activities. The four collection options and the likely costs and greenhouse gas emissions savings have been presented, with further analysis to be undertaken as part of the Business Case.

1 Introduction

Tonkin + Taylor Ltd (T+T) have been engaged by Porirua City Council (PCC), Hutt City Council (HCC) and Wellington City (WCC) to undertake stakeholder engagement, produce an organic options report (this document) and Business Case for organic collections and processing on behalf of the three Councils.

The overall project aim is to develop a Business Case that defines, assesses and recommends an option/s for the collection of organic materials from residents and businesses in Porirua, Lower Hutt and Wellington.

The approach taken focuses on services to residents and the flow-on implications of these on the potential processing approaches. This project also considers the ability to service small businesses and food processing facilities.

Options presented here will inform decision making by the individual councils as part of considering options for addressing organic material in their area.

The first part of this project is split into stages and this Organic Options Report represents the deliverable for stage 3 (Figure 1-1).

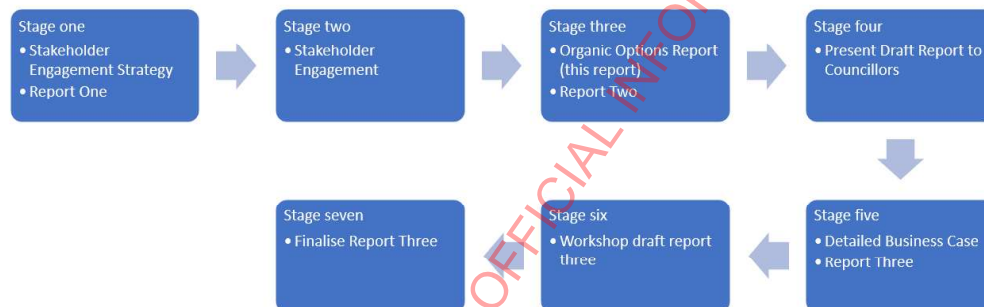


Figure 1-1: Deliverables for project (Stages 1 – 7)

This project considers both household and business (commercial and industrial scale) organic material collection and processing.

Stakeholder engagement has been undertaken to gain an understanding of the key priorities for businesses and community organisations in regards to organic material management, potential solutions (where applicable) and to provide further insight into the challenges and opportunities associated with organic material management.

The scope of work completed for this stage of the project is set out in our response to the RFP dated 14th April 2022 and agreed under contract 101882, signed 1st July 2022. The scope has also being updated through a number of discussions with the councils through May and June 2023.

The scope of work that underlies this report includes:

- A definition of the problem of organic material currently going to landfill (which includes out of district material being disposed of at landfills in the study area).
- Reviewing existing data on organic material streams from across the three council areas and beyond (where applicable), including:
 - Data and reports provided by the three councils.
 - A high-level review of existing weighbridge data (where available) for Spicer Landfill, Silverstream Landfill and Southern Landfill, alongside associated waste composition data.
 - Data shared by businesses through stakeholder engagement (organic material generators and processors of organic materials).
 - T+T knowledge of the sector for the Wellington Region.
- Estimating current and future organic material to be utilised in any organics processing including a forward projection of 10 years of feedstocks covering:
 - Porirua City and Lower Hutt combined.
 - Wellington City.
- Participating in and/or facilitating workshops with stakeholders.
- Provide an analysis of what other councils are doing in this space as part of reviewing options.
- A summary of existing collection and processing options available.
- Identification and evaluation of collection options for the three councils.
- Following on from the identification and evaluation of collection options, identifying the processing options.
- Drafting of this report.

2 Background

2.1 Overview

PCC, HCC and WCC receive over 76,000 tonnes per annum of organic material across the three landfills they operate. These being Spicer Landfill (PCC), Silverstream Landfill (HCC) and Southern Landfill (WCC).

The most recent waste audit data for the three landfills was used to provide the information on organic materials composition:

- Spicer Landfill receives over 81,000 tonnes per annum of waste, of which around 26.4% is organic (est 21,400 tonnes per annum)¹.
- Silverstream Landfill receives around 130,000 tonnes per annum of waste, of which around 23.8% is organic (31,900 tonnes per annum)².
- Southern Landfill receives around 107,000 tonnes per annum of waste, of which around 25.5% is organic (22,800 tonnes per annum)³.

2.2 The issue/opportunity

When organic material breaks down in an anaerobic environment, such as a landfill, it creates leachate and greenhouse gases. Greenhouse gases created from the breakdown of organic material include carbon dioxide and methane. These gases contribute to climate change (specifically methane given its global warming potential compared to carbon dioxide). Landfill gas makes up 4% of New Zealand's overall greenhouse emissions. Methane from landfills makes up 11% of New Zealand's total methane emissions and has an impact on New Zealand's emissions liability⁴. For landfill owners and/or operators, methane emissions create a liability under the New Zealand Emissions Trading Scheme.

The Wellington Region Greenhouse Gas Inventory⁵ details actual gross emissions created from solid waste associated with the open and closed landfills across the region. Porirua, Lower Hutt and Wellington City also have their own inventory for the year 2019-2020. An important action detailed in the Wellington Region Waste Management and Minimisation Plan (WMMP) was a commitment to investigate and develop (if feasible) a region-wide resource recovery network to include organic materials.

In March 2023, the Ministry for the Environment (MfE) released **Te rautaki para | Waste strategy**⁶ which provides strategic direction for New Zealand waste systems from now to 2050. Central Government has also outlined the future direction for organic material management and the need to divert this material from landfills. The collection of food waste from households is likely to become mandatory and there is a clear signal that over the medium term this will also apply to non-households. The Waste Minimisation Fund has invited applications from local authorities to support establishing organic materials collections and processing where these don't currently exist.

¹ WasteNotConsulting. 2023. Composition of Waste at Spicer Landfill

² WasteNotConsulting. 2022. Composition of Solid Waste at Silverstream Landfill (Confidential)

³ WasteNotConsulting. 2018. Composition of Solid Waste at Southern Landfill

⁴ Ministry for the Environment. 2023. New Zealand's Greenhouse Gas Inventory 1990–2021. Wellington: Ministry for the Environment.

⁵ AECOM. 2020. Wellington Region Greenhouse Gas Inventory

⁶ See Te rautaki para | Waste strategy. (Ministry for the Environment, 2023). Available at [Te rautaki para | Waste Strategy](#)

The strategy notes that reducing the amount of organic material that ends up in landfills will have multiple benefits. It will:

- Reduce the amount of methane generated in landfill which will reduce our greenhouse gas emissions.
- Reduce the overall volume of waste going into landfills, so that existing facilities can operate for longer.
- Using organic matter more efficiently and wasting less, in ways that can help regenerate the soil.

Alongside the benefits defined in the Waste Strategy the following have also been identified as relevant to this project.

- The National Emissions Reduction Plan defines a reduction in greenhouse gas emissions resulting in environmental benefits and investment consistent with national direction.
- Waste levy liabilities can be reduced through reduced disposal of waste to levied landfills.

However, these benefits also need to be viewed in the context of additional collection and processing requirements. These investments require funding, but also produce greenhouse gas emissions (for example trucks collecting the waste, emissions from new processing facilities). This underlines the need for a full assessment of all the benefits and costs, as part of a Business Case.

2.3 Our approach

This project will enable the councils to understand the options for collecting and processing organic materials from residents and the potential for businesses at centralised facilities in the districts. The key output will be a Detailed Business Case (Stage 5, Report 3) that will be developed, building upon this report.

A detailed Business Case is a requirement for the development of new facilities and services for each Council. The conclusions drawn from the Business Case undertaken at Stage 5, started in this report, will determine an approach to meet the requirements set out in the Wellington Region Waste Management and Minimisation Action Plans and will be in line with Wellington City Council's Zero Waste Strategy.

This report takes an approach that is consistent with the New Zealand Treasury's 'Better Business Case' approach. Treasury's approach focuses on making sure the issue or opportunity is well defined before considering a range of options to realise the opportunity. Once the right option/s have been identified (at this stage) there is a process of planning for successful delivery, ensuring that timeline and costs reflect what is required for the project to succeed.

This report focuses on the first two stages – the strategic and economic cases, with the Business Case focussing on the completion of the Economic Case as well as the Management, Financial and Commercial cases. The Treasury's five case model is outlined below.

- **Strategic Case** - what is the reason for the project?
Reflected in Section 5 (the current situation), Section 4 (policy context) and Section 3 (What are we trying to achieve).
- **Economic Case** - what is the best value for money option?
Summarising the options identification process set out in Section 6. The evaluation considers a range of factors for each option in the Business Case.
- **Management Case** - how will the project be delivered?
Discussion around progression of activities to move the options through pilot opportunities, scaled implementation and identification of future expansion options. This will be addressed in the Business Case.
- **Financial Case** - what is it going to cost and what are the options for funding?
Drawing on capital and operating costs. This will be addressed in the Business Case.
- **Commercial Case** - how will the project be procured? This will be addressed in the Business Case.

3 What are we trying to achieve?

3.1 Project objectives

Figure 3-1 provides a summary of the core problems or opportunities addressed by this report. The figure also notes some of the underlying issues and anticipated benefits of addressing the problems and realising the opportunities. These issues, problems and anticipated benefits have been used to guide the development of investment objectives.

The objectives have been defined through a workshop and discussions with project team members from PCC, HCC and WCC. The objectives also address signalled policy from government and shifting costs and markets for the current and future management of organic materials across the council areas.

The project objectives developed with the project team are:

- **Residents and businesses have access to appropriate organic material recovery options.**
- **Deliver affordable and cost-effective organic materials recovery for residents and businesses.**
- **Reduce the need for residual waste disposal.**
- **Deliver a 40% reduction in biogenic methane greenhouse gas emissions by 2035.**

10

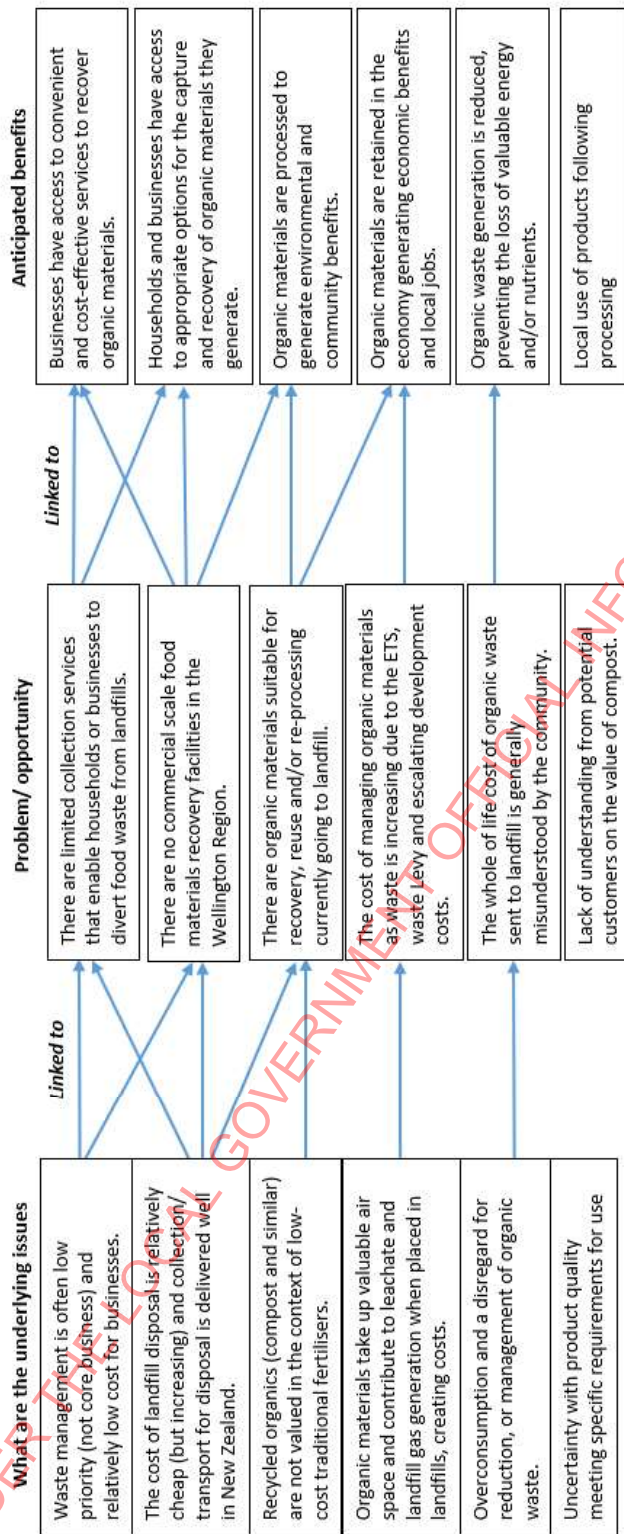


Figure 3-1: Opportunities and benefits summary

August 2023
Job No: 1020245 v1.3

Tonkin & Taylor Ltd
Organic Options Report
Porirua City Council, Hutt City Council, Wellington City Council

3.2 Key considerations

Key considerations were identified with the project team (PCC, HCC and WCC council officers and T+T) on the 27th October 2022. Targeted stakeholder engagement was also undertaken and these discussions were also considered when defining the key considerations for this project.

These key considerations will be important when assessing options and are provided below grouped under the key objectives for this project. Each consideration is relevant for collections, processing or both components.

Residents and businesses have access to appropriate organic material management options

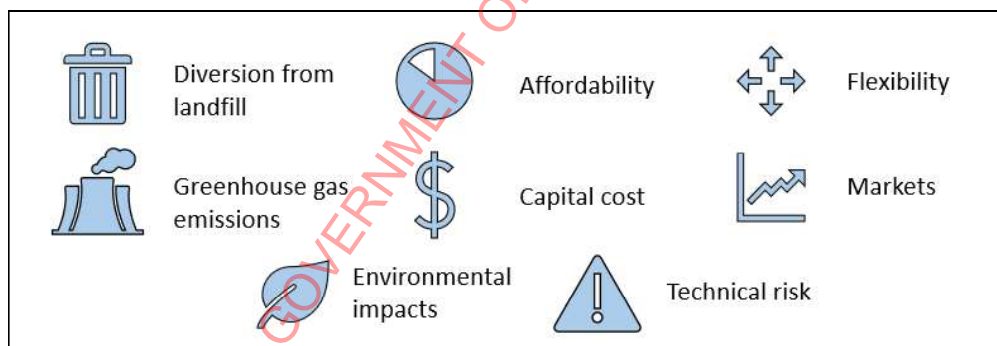
- Technical risk – design, construction and operating confidence and reliability in operation.
- Flexibility - to respond to current, signalled and potential future government policy intervention and action.
- Markets for outputs.

Deliver affordable and cost-effective organic material management for residents and businesses

- Capital cost (relevant to processing and not collections).
- Affordability (Council, ratepayers, businesses) (operating costs).
- Allowing existing diversion opportunities to continue.

Reduce the need for residual waste disposal

- Direct environmental impacts must be acceptable considering air quality (odour, dust, ...), water quality (e.g., healthy harbour, local streams), noise.
- Greenhouse gas emissions must be reduced by 40% by 2035 (operations, transport, off set, ...).



Assessing cultural impacts as part of the project was considered early in the project. Councils have been engaging with Iwi in the context of development of a new Regional Waste Minimisation and Management Plan. The councils will continue discussions with Iwi partners as broader planning and the thinking for this project progresses and once the project is at a stage where there are opportunities for Iwi involvement.

Impacts of options on existing services and community initiatives (e.g., food rescue, community composting) will continue to be considered into the Business Case.

Table 3.1: Summary of key considerations and explanation

Key consideration	Explanation
Affordability (Council, ratepayers, businesses)	Affordability will be defined as a cost range and considers capital and ongoing operational costs reflected in user charges or other funding arrangements.
Capital cost	Capital cost will be defined as a cost range. Note: it is important to consider capital cost for those who are investing in infrastructure. In the context of considering different options, capital costs is also considered as a component of affordability – see above.
Greenhouse gas emissions	The anticipated net greenhouse gas emissions associated with the options assessed.
Technical considerations	The level of risk associated with the options based on track record (NZ and international), complexity and supplier capability. Reliability. Availability of additional process inputs, for example bulking materials for the composting of putrescible materials such as food waste. Pre-processing requirements, for example depackaging of unwanted/expired food products.
Flexibility	The ability of options to adjust to changes in feedstocks, quantity, markets and policy framework.
Markets	The level of confidence in markets for the output(s) from the solution. Product specifications, for specific markets and to meet any relevant regulatory requirements.
Diversion from landfill	The amount of new diversion of organic material from landfill disposal.
Environmental impacts	The risk of adverse environmental impact (air quality, water impacts) for a well-designed and operated solution.
Health and Safety	Health and Safety (integral to any options identified).
Location	Availability and suitability of locations for processing.
Consenting risk	The ability to gain appropriate consents and building permits for specific or potential locations and infrastructure.

4 National policy and regional policy context

4.1 Context overview

Central Government guides the direction of waste and resource management within New Zealand. A range of legislation and policy sets the framework for waste management and resource recovery in New Zealand.

The purpose of specific components vary, but overall the intent, in alignment with the new Waste Strategy, is to transition towards a low-emissions, low-waste society, built upon a circular economy.

Key components of the framework include:

- Legislation, including the Waste Minimisation Act (2008), Litter Act (1979), Resource Management Act (1991), the Climate Change Response Act (2002).
- Policy tools under the Waste Minimisation Act 2008 including the Waste Disposal Levy, the Waste Minimisation Fund and the recently released Te rautaki para Waste Strategy.
- The Emissions Reduction Plan, prepared under the Climate Change Response Act 2002.
- The Local Government Act 2002 is also relevant, setting the framework for local government activity including local government activity related to waste management and resource recovery.

The framework is summarised in Table 4.1 with further details provided in the following sections.

Table 4.1: Relevant policy for waste across PCC, HCC, and WCC

National	Regional	Territorial Authority Specific
The Waste Minimisation Act 2008 (under review)	Regional WMMP as part of The Waste Minimisation Act 2008	HCC Long-term Plan 2021 – 2031 HCC Solid Waste Management and Minimisation Bylaw 2021 HCC local action plan as part of the regional WMMP
The Resource Management Act 1991 (under review)		PCC Long-term Plan 2021 – 2031 PCC Solid Waste Management & Minimisation Bylaw 2021 PCC local action plan as part of the regional WMMP
Climate Change Response Act 2002		WCC Long-term Plan 2021 – 2031 Solid Waste Management and Minimisation Bylaw 2020 Collection and Transportation of Waste 2014 WCC local action plan as part of the regional WMMP
Te rautaki para Waste Strategy 2023		
Emissions Reduction Plan 2022		
The Local Government Act 2002		

4.2 The Waste Minimisation Act 2008 (under review)

The Waste Minimisation Act 2008 sets a framework to encourage a reduction in the amount of waste generated and disposed of in New Zealand, minimising environmental harm from waste and providing economic, social and cultural benefits⁷. The Act includes provisions related to imposing a waste disposal levy, establishing the Waste Minimisation Fund and enabling voluntary and mandatory product stewardship.

From July 2021 the New Zealand Government has progressively increased the national waste disposal levy at Class 1 landfills from \$10 per tonne, reaching \$60 per tonne in July 2024. Table 4.2 Alongside the increase, the waste disposal levy is also being progressively expanded to apply to waste disposed of at class 2, 3 and 4 landfills. At the time of writing, the waste disposal levy at Class 1 landfills has been \$30 per tonne since July 2023 (refer Table 4.2).

Table 4.2: Timeline for the increase and expansion of the waste levy

Landfill Class	Waste Types	1 July 2021	1 July 2022	1 July 2023	1 July 2024
Municipal Landfill (Class 1)	Mixed municipal wastes from household, commercial, and industrial sources	\$20/t	\$30/t	\$50/t	\$60/t

4.3 The Resource Management Act 1991 (under review)

The Resource Management Act 1991 promotes sustainable management of natural and physical resources. Although it does not specifically define ‘waste’, the RMA addresses waste management and minimisation through controls on the environmental effects of waste management. The government is working through a reform of resource management law in New Zealand with a proposed Natural and Built Environments Act, Spatial Planning Act and Climate Adaptation Act.

⁷ See Waste Minimisation Act 2008 (Ministry for the Environment, 2008) available at [Waste Minimisation Act 2008 No 89 \(as at 01 January 2016\), Public Act Contents – New Zealand Legislation](#)

4.4 Climate Change Response Act 2002

The **Climate Change Response Act 2002** puts in place a legal framework to enable New Zealand to meet its international obligations under the United Nations Framework Convention on Climate Change, the Kyoto Protocol and the Paris Agreement. The Act was amended in 2019 to provide a framework by which New Zealand can develop and implement clear and stable climate change policies that:

- Contribute to the global effort under the Paris Agreement to limit the global average temperature increase to 1.5 degrees Celsius above pre-industrial levels.
- Allow New Zealand to prepare for, and adapt to, the effects of climate change.

4.5 The Local Government Act 2002

The **Local Government Act 2002** covers a wide range of local government activities, all with the purpose of promoting social, economic, environmental and circular wellbeing both now and in the future. Of particular relevance to waste management and resource recovery is the requirement to develop a Long Term Plan, setting out Council priorities and budgets over a 10 year timeframe. The Long Term Plans are where spending that has been set out in the Councils' WMMPs are actually committed.

4.6 New Zealand Waste Strategy

In March 2023 the MfE released **Te rautaki para | Waste strategy**⁶. The vision for Te rautaki para is that "by 2050, Aotearoa New Zealand is a low-emissions, low-waste society, built upon a circular economy. We cherish our inseparable connection with the natural environment and look after the planet's finite resources with care and responsibility".

Te rautaki para sets the direction over the next three decades for work on waste by central and local government, the waste management sector, individual industries and businesses, and residents and communities. At the time of issuing this report, Te rautaki para is not considered statutory, beyond territorial local authorities needing to have regard of it in the preparation of their WMMP.

This strategy is focused on directing a collective journey towards a circular economy for New Zealand. The strategy vision is guided by a set of principles:

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

The priorities of Te rautaki para are aligned with the report Ināia tonu nei: a low emissions future for Aotearoa⁸ released by the Climate Change Commission in June 2021. These include:

- Reducing waste.
- Diverting organic materials from landfill to recycling or composting.
- Improving and extending landfill gas capture systems.

⁸ Ināia tonu nei: a low emissions future for Aotearoa (Climate Change Commission, 2021) Available at [Ināia tonu nei: a low emissions future for Aotearoa \(climatecommission.govt.nz\)](https://climatecommission.govt.nz/emissions-future-for-aotearoa)

Together these priorities provide direction as to how New Zealand could meet its international emissions reduction commitments and its obligations under the Climate Change Response Act 2002 and actions that relate to waste. The Emissions Reduction Plan (see below) responds to the analysis and suggestions including actions addressing the disposal of organic materials to landfill.

The New Zealand Waste Strategy is a key implementation mechanism for the waste and resource recovery components of the Emissions Reduction Plan. The New Zealand Waste Strategy has set targets for organic materials recovery.

4.7 Emissions Reduction Plan 2022

The **Emissions Reduction Plan** was released in 2022 and is a mechanism to allow New Zealand to prepare for the effects of climate change, transitioning towards a more resilient low emissions economy. The plan sets out policies, strategies and actions for the decarbonisation of every sector. In terms of waste, organic materials are a key focus at both a household and business level alongside exploration of bans or limits for the diversion of organics from landfill. The plan outlines the following:

- Improve household kerbside collections of food scraps and garden waste.
- Invest in 2050 targets in line with the National Emissions Reduction Plan for biogenic methane in organic material processing.
- Resource recovery infrastructure.
- Require the separation of organic materials.
- Has a target of a 40 per cent reduction in biogenic methane by 2035 (relative to 2017 levels).

As noted above, the Emissions Reduction Plan relies on the New Zealand Waste Strategy to address waste and resource recovery related activities. In developing target emissions reductions, the ERP notes that:

... [the target] assumes 40 per cent of food waste diverted to composting (20 per cent windrow and 20 per cent in-vessel composting, or IVC) and 60 per cent to anaerobic digestion. It also assumes 100 per cent of diverted green waste to composting (60 per cent compost and 40 per cent IVC). In practice the best processing option should be selected based on availability of waste types and markets for potential products.

4.8 Regional policy and priorities

At a regional level, the key policy relates to the management of the impacts of organic materials collection and processing. In the Wellington Region this is addressed in the Regional Policy Statement (currently under review) and the Natural Resource Plan. Any proposals for processing will need to meet the policy intent and operate under the relevant rules in these documents.

4.9 Territorial authorities responsibilities

Territorial authorities have responsibilities under the Local Government Act 2002, Waste Minimisation Act 2008, and the Resource Management Act 1991.

WMMPs are developed in accordance with the requirements of the Waste Minimisation Act 2008. The Wellington region has a joint WMMP, which sets out the priorities and strategic framework for the minimisation and management of waste across the region. Reviews are completed every six years to ensure relevance and continual improvement.

The Wellington Region WMMP (2017-2023) has a regional action to develop a Resource recovery network. The network is to include 'facilities to divert more material including food and/or biosolids and other organic waste'.

Each of the Councils work to a Long-term Plan (LTP), prepared in accordance with the requirements of the Local Government Act 2002. These are the PCC Long-term Plan 2021-31, HCC Long-term Plan 2021-2031, and WCC Long-term Plan 2021-2031.

Each LTP provides an overview of the Council's overall strategy beyond the term of their Joint WMMP. With this, funding is committed to the implementation of the Councils' respective WMMPs.

Key themes across the 3 LTPs are:

- Resource recovery and diversion of waste as a means to mitigate climate change.
- Continuation and expansion of Council services including kerbside rubbish and recycling, transfer station and landfill operations.
- Commitment to investment in infrastructure for resource recovery and waste diversion.

WCC is also carrying out a significant body of work that intersects these three themes – the diversion of wastewater sludge from the Southern Landfill. This work is expected to significantly divert/decrease the volume of organic materials WCC sends to landfill, increase the lifespan of the Southern Landfill and significantly invest in WCC's waste management infrastructure.

The Council has received approval through their LTP to establish the processing facility that is due to be operational by 2026.

5 Current situation (where are we now?)

5.1 Data collection and analysis

A desktop-based assessment was completed using reports and data provided by PCC, HCC and WCC, that summarise information on organic material in each region. Information was also provided by commercial/industrial stakeholders.

Existing information on organic material reviewed included:

- PCC Annual Economic Profile 2021.
- PCC Waste Audit Project Report 2020.
- PCC Internal Recycling Systems Project.
- PCC Solid Waste Management Reporting 2018 – 2021.
- PCC Solid Waste Analysis Protocol (SWAP) Report 2022.
- Spicer Landfill Organics Drop Offs 2022.
- Silverstream Landfill (HCC) SWAP 2022.
- Audit of Kerbside Rubbish and Recycling Lower Hutt 2022.
- WCC Para Kai Trial Lessons Learned 2022.
- WCC SWAP Survey 2018.

Where necessary, this information was supplemented by:

- Information provided by Council staff.
- Information provided by commercial/industry waste generators and operators in the region.
- T+T knowledge of the sector in the Wellington Region.
- T+T knowledge of waste composition from similar regions in New Zealand.

A Situation Review Report has been prepared as part of the Wellington Region Waste Minimisation and Management Plan review and Waste Assessment. Information compiled in this report will be considered in the Business Case including noting any significant differences from the data presented here.

5.2 Defining organic materials

The organic materials considered in this Options Report are defined as:

- **Food waste (FO):** Food waste comes from food that is not eaten. This includes household kitchen scraps and food that is produced but not consumed. It also includes commercial waste created during production, processing, distribution and the sale of food.
- **Green waste (GO):** Green waste includes grass cuttings, hedge clippings, tree trimmings and other vegetation. This is sometimes also referred to as garden waste.
- **Organic material:** This type of material includes green or garden waste and food waste as well as other degradable materials such as biological sludges (from wastewater treatment), paper, cardboard and timber.
- **Food and garden combined (FOGO):** a collection which involves both food and green waste being collected together.

5.3 Waste management systems

5.3.1 Council services and facilities

5.3.1.1 Collections

Council kerbside collection services for landfill waste (incorporating organics) and separated organics (where relevant) only are shown in Table 5.1. These services are provided to households only.

Table 5.1: Council services (landfill and separate organic collections only) provided to residents and businesses capturing organic materials

	Rubbish		Green waste		Food waste
District Council	Size and collection period	Funding and pricing	Size and collection period	Funding and pricing	
Porirua City Council	60L bags – weekly	User pays, \$3.50 per bag	No separate collection provided	n/a	No separate collection provided
Hutt City Council	80L, 120L, 240L bins – weekly	Targeted rate \$105, \$148, \$296	240L (optional), 4 weekly collection	Rates, \$103/year	No separate collection provided
Wellington City Council	70L bags ⁹ – weekly except in central business district where collection is daily ¹⁰	User pays, \$3.29 per bag, \$16.45 for 5 bags (recommended pricing)	No separate collection provided. Rubbish bags must have less than 10% green waste		No separate collection provided

While WCC do not currently collect organic materials they have conducted trials that indicate organic kerbside collection is the most effective method to divert food waste from landfill¹¹.

⁹ Rubbish collection is for residential only and excludes multi-unit developments of 10 or more units.

¹⁰ Inner city collection between 5.30pm and 10pm on a daily basis.

¹¹ Para Kai Miramar Peninsula Trial, accessed on 21 October 2022 at <https://wellington.govt.nz/rubbish-recycling-and-waste/reducing-your-waste/miramar-food-waste-trial>.

5.3.1.2 Transfer stations

Transfer stations in the three participating districts are summarised in Table 5.2.

Table 5.2: Transfer stations in HCC, PCC and WCC

Transfer Station	Council Area	Location	Organics accepted
Seaview Recycling and Transfer Station	Lower Hutt	27 Seaview Road, Seaview, Lower Hutt 5010	Green waste stockpiled on site, awaiting transport to composting site
Recycling area, The Tip Shop and Transfer Station (Southern Landfill Tip Shop and Recycle Centre)	Wellington City	Landfill Road, Ōwhiro Bay, Wellington 6023, New Zealand	Green waste accepted for processing by Capital Compost
Spicer Landfill transfer station, Trash Palace Porirua	Porirua City	20 Broken Hill Road, Kenepuru, Porirua 5022, New Zealand	Green waste accepted as a single stream ¹² .
Silverstream Transfer Station	Lower Hutt	Reynolds Bach Drive, Stokes Valley, Lower Hutt 5019	Green waste accepted as a single stream ¹²

5.3.2 Private services including community scale initiatives

There are several private services operating across the three participating districts. These can be separated as private waste operators who provide bins to residents and businesses, and those that have collection schedules or drop off locations. There are also several food banks, wellbeing support and composting facilities in the region. These either accept edible food, accept green waste for composting, or use compost in their processes. It should be noted that the acceptance criteria of materials for green waste differs by provider.

There is one private transfer station that operates in Lower Hutt which uses Silverstream landfill to dispose of residual waste. Private services have been summarised below.

¹² Transported to an offsite composting facility

Table 5.3: Summary of private organic services

Council area	Name	Location	Type of containment and destination facility	Service	Frequency
Private operators					
PCC, Lower Hutt, WCC	EnvironNZ	127R Gracefield Road, Gracefield, Lower Hutt	Provider for home and business waste (Kai to compost) pickup (120L to 30 m ³).	Household/ commercial	Dependant on location
PCC	McMud	36 Aruba Grove, Grenada Village, Wellington	Green waste from Spicer Landfill and local disposal. Waste is mulched at the landfill and windrow composted at McMud.	Household	Drop off only
PCC	Composting NZ (Otaihangā facility)	25 Ulric Street, Plimmerton, Porirua	Composting facility, accept green waste disposal. Do not accept food.	Household/ commercial	Drop off only
PCC	LowCost Bins	4-6 Jepsen Grove, Wallaceville, Upper Hutt 5018	Wheelee bins, skip bins and recycling bin providers and collections.	Household	Weekly collections
Lower Hutt, PCC	Owyak Bin Hire Ltd	111 Parkside Road, Gracefield, Lower Hutt	Skip bin hire. Includes skip bins for organics.	Household/ commercial	On request
Lower Hutt, PCC, WCC	Waste Management	27 Seaview Road, Seaview Lower Hutt	Offer 80L, 140L, 240L bins—varies across districts on availability. Skip bins (2m ³ , 3.5m ³ , 7.5m ³), FlexBins (1m ³ , 2m ³ , 3m ³). Green waste collection. Green waste sent to Composting NZ in Kapiti.	Household/ commercial	Weekly and on demand
WCC	Capital Compost	Landfill Road, Ōwhiro Bay, Wellington	Composting facility, process green waste and food organics from business collections.	Household	Drop off only
PCC, Lower Hutt, WCC	Organic Waste Management Limited	PO Box 14 085 Kilbirnie Wellington	Provide food waste wheelie bins in 120L or 240L.	Commercial collection	Daily, weekly or seasonally
WCC	Kai to Compost	N/A	Bin service using 120 L or 240 L wheelie bins for food waste.	Commercial	Scheduled collection Monday to Saturday

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Council area	Name	Location	Type of containment and destination facility	Service	Frequency
Food banks, wellbeing support and composting facilities					
PCC	Wesley Community Centre	6 Hagley Street, Porirua City Centre, Porirua	Community garden and compost.		Drop off, trial of urban farm (Porirua East School)
PCC	Edible Earth/ WELLfed	54 Hampshire Street, Cannons Creek, Porirua	Composting, accept green waste, provide household collections in Porirua City.		Not stated
PCC	Kiwi Community Assistance	Grenada North	Providing food rescue to Porirua supermarkets. Accepts edible food donations.		N/A
WCC	Kaicycle Composting	5 Hospital Rd, Newtown, Wellington]	Takes compostable scraps from homes, offices and small businesses (20 L bucket collection).		Weekly collection and weekly drop off options
Lower Hutt	Remakery	310 Waiwhetū Road, Fairfield, Lower Hutt	Grocer, kitchen and café using locally grown produce.		N/A
WCC	Kaibosh Food Rescue	11 Hopper Street, Mount Cook, Wellington	Food rescue supporting communities in need. Accepts edible food donations.		N/A
WCC	FoodPrint	N/A	Mobile app for customers looking for leftover food at discounted prices.		N/A

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5.3.3 Material view

5.3.3.1 Food waste

Food waste is not currently separately collected in the participating districts by the respective councils. Private operators offer the following food waste collections:

- Collection of source segregated food waste from businesses (for example Kai to Compost, Organic Waste Management).
- Household and commercial compostable scraps collected in buckets or self-hauled to collection points (Kaicycle).
- Edible food donations can be made for communities in need (for example WELLFED, Kiwi Community assistance, Kaibosh).
- Some businesses and homes will self-compost (including vermicomposting) their food waste.
- Piggeries use (some) food waste as stock feed.

An overview of key food waste sources and destinations is provided in Table 5.4.

Table 5.4: Food waste collection operators and disposal destinations across the three participating districts

Food waste collection operators	Destination
Kaicycle Composting	Kaicycle composting facility, Newtown
Organic Waste Management	Capital Compost, Southern Landfill
EnviroNZ (Kai to Compost)	Capital Compost, Southern Landfill
Component of Transfer Station general waste (three Councils combined)	Landfill
Component of kerbside general waste collection (three Councils combined)	Landfill
Commercial/industrial food waste (pre and post-consumer)	Stock food Compost Landfill (combined with other landfill waste)
Private green waste collection operators	Compost (Composting NZ, Capital Compost)

5.3.3.2 Green waste

Major origins of green waste in the three participating council areas include:

- Collection of source-separated garden and green waste via the HCC household green waste bin collection service.
- Collection of household waste from Lower Hutt, PCC and WCC collected in bins that contain garden and green waste.
- Household garden waste that is collected via a privately serviced green waste bin.
- Household garden waste that is self-hauled by residents to a transfer station.
- Household general waste that is self-hauled by residents to a transfer station and contains garden waste.
- General waste generated by the commercial/industrial sector that contains significant portions of garden waste, for example from landscaping activities. This general waste is then collected for disposal (in wheelie bins, commercial/industrial waste bins or skip bins) or self-hauled to transfer stations.
- Commercial garden waste that is self-hauled by businesses to a transfer station.

A summary of garden waste collections across the three Council areas is shown in Table 5.5.

Table 5.5: Green waste generation in the three participating districts

Source	Average quantity (estimated tonnes per annum)	Destination
HCC household green waste collection service	2,000	Composting New Zealand
Seaview Transfer Station	Not available	Composting New Zealand
Spicer Landfill self-drop-off	3,300	McMud
Silverstream Transfer Station self-drop-off	2,000	Composting New Zealand
Southern Landfill drop off	1,000	Capital Compost
Component of general waste defined as compostable green waste being sent to landfill (three Councils combined) ¹³	27,300	Landfill
Other garden waste recovered (not through transfer stations) including private contractors i.e. Waste Management New Zealand	Commercially sensitive	Various private processing operations

¹³ SWAP Waste Composition Surveys for Southern, Spicer and Silverstream Landfills. Audit of kerbside rubbish and recycling in Lower Hutt. SWAP for Silverstream – data also includes green waste for Upper Hutt City Council. Spicer includes kerbside green waste from outside of the district.

5.4 Landfills across the council areas

There is one landfill in each city. These are summarised in Table 5.6 and presented in Figure 5-1. Southern Landfill also runs a transfer station, composting centre (Capital Compost) and The Tip Shop and Recycling Centre. Bagged compost produced at Capital Compost is sold from The Tip Shop.

There are transfer stations at Spicer Landfill and Silverstream Landfill with provision for green waste drop off.

Table 5.6: Summary of PCC, HCC and WCC landfills

Landfill	Council	Location	Consent Expiry/ Fill Date ¹⁴
Silverstream	Hutt City Council	Reynolds Bach Drive, Stokes Valley, Lower Hutt	Consented to 2055
Spicer	Porirua City Council	Broken Hill Road, Broken Hill, Porirua	Consented to 2030, capacity to 2045
Southern	Wellington City Council	Landfill Road, Ōwhiro Bay, Wellington	Current cell capacity to approximately June 2026. Planned extension to at least 2047.

At the time of writing (June 2023), the charges for green waste drop off at each landfill are:

- Spicer Landfill - \$15 per car and \$145.60 per tonne¹⁵.
- Silverstream Landfill - \$126.50 per tonne with a minimum charge of \$15 per vehicle¹⁶.
- Southern Landfill - \$80.50 per tonne, with minimum charges applied to private and commercial vehicles or trucks¹⁷.

¹⁴ Information from Wellington Region Waste Assessment 2016, accessed 20/12/22 at <https://mstn.govt.nz/wp-content/uploads/2017/02/Wellington-Region-Waste-Assessment-2016.pdf>.

¹⁵ Charges at Spicer Landfill at time of writing accessed 20/12/22 at: <https://porirua.govt.nz/services/rubbish-and-recycling/spicer-landfill/>

¹⁶ Charges at Spicer Landfill at time of writing accessed 20/12/22 at: <https://www.huttcity.govt.nz/services/rubbish-and-recycling/rubbish-and-recycling-fees-and-charges>.

¹⁷ Charges at Southern Landfill at time of writing accessed 20/12/22 at: <https://wellington.govt.nz/rubbish-recycling-and-waste/southern-landfill-tip-shop-and-recycle-centre/landfill-charges>

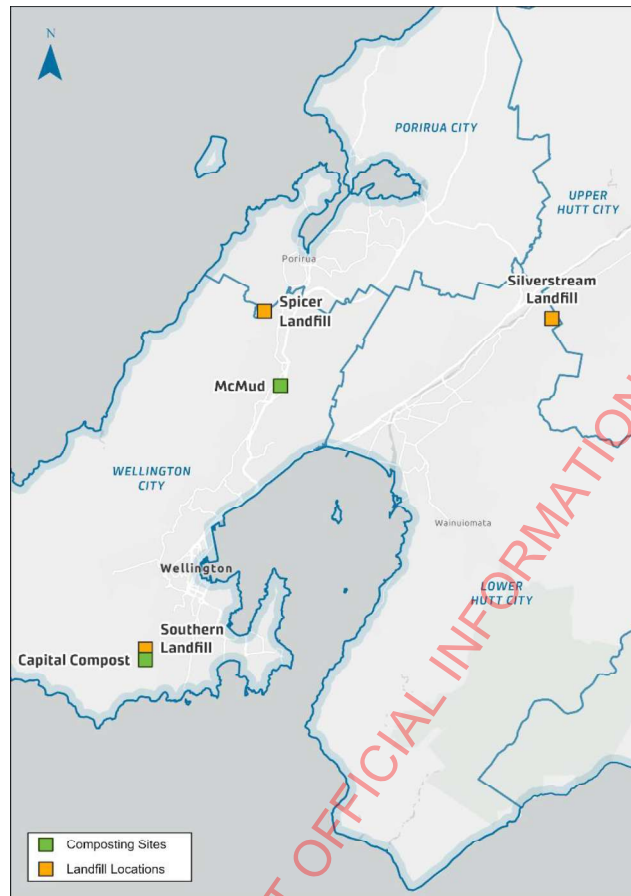


Figure 5-1: Landfill and composting site locations¹⁸

5.5 Waste quantity and composition projections

A key aim of this project is targeting food and green waste. This includes projecting the likely quantities to be created over the next 10+ years. Population growth is accounted for, and is likely to increase the volumes of organic material generated over this time. Population growth needs to be considered alongside the current government policy signals (as detailed in Section 2.3), which will likely require diversion of organics away from landfills from both residents and businesses.

¹⁸ Note: Spicer Landfill accepts drop off of green waste and sales of compost only. All green waste dropped off at Spicer Landfill is transported to McMud for processing. Composting NZ, located in Kapiti is located outside of the region and is included as it receives green waste collected from HCC green waste collections and Silverstream Transfer Station.

It is also worth noting that some already difficult to manage organic streams are becoming increasingly difficult to divert away from landfill. For example, composting of 'other' organic streams such as biological treatment sludges and food processing residues from commercial scale food manufacturing processes. Previously these organic material streams have been processed (composting) outside of the Wellington region¹⁹, however this option is no longer available, and these organic streams are sent to landfill.

With processing options limited there is potential for these materials to seek management/processing options within the Wellington Region.

5.6 Initial stakeholder engagement

The councils undertook preliminary engagement (mid 2022) with a number of business and community organisations in order to better understand the current barriers and opportunities that these organisations face in dealing with organic materials.

The discussions provided some insight into organic materials generated across the council areas, existing processing options, identification of barriers and opportunities for managing organic materials and attitudes towards organic materials management and collections.

Due to local body elections, stakeholder engagement was not extended to residents.

The key themes and considerations established throughout the conversations held with a number of organisations (mostly those organisations already involved in waste minimisation) are provided in Appendix A.

¹⁹ Examples include DAF sludge from meat processing and municipal biosolids. Challenges including managing odorous materials and limited end markets for products containing biosolids.

6 Options development

6.1 Overview

When considering the activities that occur for organic material management the key components are collection, processing and markets. These key components cannot be considered in isolation. Further detail can be found in Appendix B on the different options available and considerations for collections. This options assessment has been completed in a number of stages, which have been laid out below.

This project has considered options for organic material from two perspectives:

- Collections – providing services to residents and collating enough information to inform processing options. This is the first stage and focuses on materials to be collected and thus the available collection methods.
- Once collection options have been defined, this will inform the options available for processing, which will be considered in terms of the different technologies and location considerations.

Following on from the above, there are a number of flow on implications, which require consideration by the three councils as part of this report:

- Level of service that is provided to their customers – i.e. services that ratepayers receive.
- The councils are seeking information as part of this report and also the Business Case to support them in seeking funding from the Waste Minimisation Fund.
 - At this stage the councils are working together to collate information to feed into two Expression of Interest applications for submission to MfE.
 - o One application for collections, focussed on capital investment (collection containers).
 - o One application for processing (effectively assuming that councils will co-invest in establishing organic materials processing with grant funding support from the WMF).

6.2 Material available for collection

There are a range of materials 'available' in the currently landfilled material stream. As noted previously, the focus of this analysis is on food waste (including material from hospitality and food processing) and garden waste. These materials can be targeted as discrete materials or as mixed streams. Other degradable materials, such as untreated timber and paper/carboard are not considered further but could potentially provide additional feedstock.

Additional material streams that are not typically part of the mixed landfill waste stream include: waste treatment residues such as oils/fats/greases from grease traps, sludges from biological waste treatment processes and bedding from animal housing (poultry sheds, Wellington Zoo, aviaries). While these are unlikely to be targeted by collection or processing systems, some processing options may be able to accommodate these materials.

Note that the scope of this project does not include biosolids (solids from mixed household and commercial wastewater treatment).

The acceptance or not of **compostable packaging** is an important consideration²⁰. Compostable plastics are sold in New Zealand and have the potential to be present in food and green waste

²⁰ Some collections provide or allow for bin liners including compostable plastic liners. The ability of the selected processing option to handle these materials will be an important consideration in determining whether they will be used.

streams. Compostable, fibre based packaging (cardboard, bamboo) is also marketed in New Zealand. In general these materials can be challenging to process and may be indistinguishable from non-compostable materials. In this context targeting compostable packaging is **not recommended**.

6.3 Collection options

When considering the collection of organic materials, the receptacle used and methodology are important. These will vary depending on the target material, collection frequency and anticipated quantity of material handled. A summary of the available container options suitable for various target materials and collection approaches has been provided in B5.1.

The preferred collection container and collection approach will be defined by target materials. Anticipated material quantities and the distance to be travelled to the processing facility are also important considerations.

The collection options based on target material are:

- Green waste only.
- Food waste only.
- A combined green and food waste collection service.
- Collection of both green waste and food waste, but via separate collections.

The focus is collections from residents, however commercial food and green waste capture is also being considered. With regards to the options defined above, Table 6.1 provides further information on the collection options available – starting with defining the material to be collected. Other key information provided below includes:

- Customer group – who will receive the collection – households and potentially commercial activities.
- Projected quantity of material diverted based on an assume capture rate – (T) household and commercial.
- Collection bin type.
- Collection frequency.
- Rubbish collection frequency following implementation of the organics collection.

Anticipated cost and greenhouse gas emissions associated with the options have been considered and are provided in Table 6.1. Costs are based on publicly available information about collection systems and processing facilities across New Zealand. Costs are presented as:

- Total cost (anticipated tonnes processed multiplied by the cost per tonne).
- Cost per tonne.
- Cost per household each year (likely to be levied as a targeted rate).

When calculating emissions from the collection options, we have considered indicative emissions using the assumptions set out in Appendix C.

All kerbside service options above are suitable to operate alongside home composting and community scale composting.

The decision has been made to defer a decision on the collection bin type and vehicle type that will be adopted to be defined as part of the procurement process. The collection options considered have typical bin and collection vehicles and these have been noted where relevant.

6.3.1 Other considerations for collections

As well as assessing costs (affordability and capital cost) and greenhouse gas emissions, diversion from landfill and flexibility are also relevant when thinking about collections.

Diversion from landfill as part of a collection considers the amount of material which can be captured at the kerbside. This depends on a number of factors including:

- The type/s of organic materials being targeted (for example food only or food and green waste collected together).
- Container size for both the organic materials and rubbish bin.
- How many households participate in the organic materials collection service.
- How effectively the participating households use the service i.e. is all of the targeted material placed in the organic materials bin.

6.3.1.1 Diversion from landfill

Collection of both food and green waste will capture²¹ a larger volume of material, compared to a green only or food only collection for example. This is reflected in the tonnage diverted from landfill noted in the tables below. There is some evidence that collections targeting food only or green waste only capture a higher proportion of available material, but for this analysis we have assumed a target 50%²² capture of target materials in all cases for residential collections.

Participation of users in the collection service will need to be closely supported by a behaviour change campaign. This should begin prior to the roll out of the organic materials collection and run through roll out. Ongoing education and information is a critical part of service delivery, informing residents on how to use the system correctly and ensuring that money spent on service delivery delivers the best possible return.

Reducing the size of rubbish waste bins and collection frequency has been used around New Zealand to actively encourage diversion of recycling out of the rubbish bin. This should also be considered when rolling out an organic materials collection and the ability to encourage the correct participation (i.e. putting the right waste in the right bin).

Table 6.1 and Table 6.3 show tonnage collected at the kerbside and tonnage diverted from landfill. The data provided in Table 6.1 is for Wellington, Hutt and Porirua City councils only. However, in Table 6.3 (processing) we have included these volumes of organic material from outside of the districts, which includes Upper Hutt City Council areas contributing waste to Spicer and Silverstream Landfills.

6.3.1.2 Flexibility

Flexibility considerations for collections refers to the ability to adjust to changes, whether this is the type and quantity of organic materials targeted for collection at the kerbside or regulatory changes. For example a food only collection, which would likely use a 23L caddy, would not allow for the addition of green waste i.e. another bin would be required. Flexibility in terms of material collected is more relevant to processing technology considerations – to allow for both quantity and material type changes.

²¹ The 'capture' of organic materials from households is a function of how many households 'participate' and how much of the organic materials available from participating households is placed in the organic materials container.

²² Note: there is a range in capture rates reported across New Zealand from 38.8% reduction in food waste to landfill per household recorded as part of the Para Kai Miramar Peninsula trial, MfE estimates an average capture of between 45-55% as 'good' and over 55% has been recorded in Timaru.

6.3.1.3 New Zealand collection examples

Examples of organic materials collection from households in New Zealand include Tauranga (food only and optional green waste), Timaru (food and garden combined) and Hamilton (food only). Key metrics for these systems are noted in Figure 6-1.

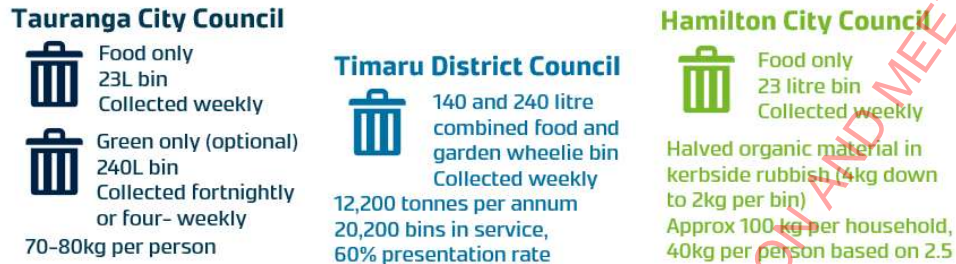


Figure 6-1 Example organic materials collection in New Zealand

It is worth noting that these are just three examples from around New Zealand. The volume of materials captured varies both between different collection types, but also even where the same service is in place.

6.3.2 Collection options summary

Table 6.1 summarises the collection options identified. The configuration of the collection approach (bins used, vehicle, collection frequency) for each option has some flexibility and will be determined in detail through detailed system design and procurement. The project materials captured (on an annual basis) make assumptions regarding households serviced and capture rate.

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Table 6.4: Collection option information

Kerbside service option	Description	Customer group	Tonnage collected at kerbside per annum (three councils only) ²³	Tonnage diverted from landfill per annum (commercial)	Collection bin type /s (typical)	Collection vehicle type (typical)	Collection frequency ²⁴	Rubbish collection frequency	Collection emissions (kg/CO ₂ /annum), range (see Appendix C for further details)
A	Green waste only	Household	5,070	0	>80L	Side-lifter	Four-weekly	Weekly	Electric: 550 – 800 Hybrid: 4,400 – 5,900 Diesel: 5,500 – 7,350
B	Food waste	Household and commercial	12,560	5,130	23L food waste (household) 80L+ food waste (commercial)	Low entry vehicle (manual)	Weekly	Fortnightly	Electric: 4,540 – 8,100 Hybrid: 34,000 – 61,250 Diesel: 42,700 – 76,800
C	Green waste, food waste (mixed collection)	Household and commercial	17,630	7,760	>80L	Side-lifter	Weekly	Fortnightly	Electric: 2,910 – 3,880 Hybrid: 22,000 – 29,350 Diesel: 27,580 – 36,780
D	Green waste, food waste (separate collections)	Household and commercial	17,630	7,760	240L green waste, 23L food waste	Side-lifter	Weekly – food waste Four-weekly – green waste	Fortnightly	Electric: 5,420 – 9,290 Hybrid: 40,760 – 70,170 Diesel: 51,100 – 87,960

²³ Excludes Upper Hutt City Council controlled organic waste as part of the rubbish collection. Excludes the organic material portion of waste received at Spicer Landfill from collections outside of Porirua.

²⁴ Collection frequency may vary and will be determined through procurement.

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6.4 Processing options

6.4.1 Processing options identified

As mentioned prior, once a collection option(s) has been chosen, the options for processing can then be considered (demonstrated in Table 6.2). The processing options discussed below are suited to various combinations of feedstock. In some cases feedstock will be collected together, in others separately collected feedstocks (and supplementary materials) are combined prior to, or during processing. Processing options are further explored in the Business Case.

The purpose of this section is to highlight processing options and provide information to inform any future procurement process. It is likely that procurement will allow respondents to nominate a range of processing solutions subject to achieving key outcomes and addressing the considerations noted in this report.

Table 6.2: Processing options and suitable feedstocks

Processing options	Food waste	Green waste	Food and green	Other materials	Comment
Food rescue	✓	✗	✗	✗	Protecting food quality is important.
Stock feed	✓	✗	✗	✗	
Community composting	✓	✓	✓	✗	Limited scale and careful management of food waste component would be required.
Vermicomposting	✓	'Soft' green waste	'Soft' green waste	✓	Some green waste can be processed. Pre-processing is important.
Aerated static pile composting	✓	✓	✓	May be suitable	Getting the mix right and pre-processing are critical to producing a quality product.
Windrow composting	✗	✓	Subject to location	✗	
In-vessel composting	✓	✓	✓	May be suitable	Getting the mix right and pre-processing are important. Post processing maturation required.
Wet anaerobic digestion	✓	May be suitable for 'soft' green waste	May be suitable for 'soft' green waste	May be suitable	Getting the mix right and pre-processing is important. Digestate may require dewatering or other processing.
Dry anaerobic digestion	✓	May be suitable for 'soft' green waste	✓	May be suitable	Getting the mix right and pre-processing are important. Post processing maturation of digestate required.

Note: soft – green waste which excludes branches/ twigs.

Processing options cannot be considered alone without thinking about markets and the ability to have a guaranteed outlet for products following processing.

Table 6.3: Processing option information

Kerbside service option	Processing options	Customer group	Tonnage diverted from landfill per annum (household) ^{25,26}	Tonnage diverted from landfill per annum (commercial)	Total cost per annum (tonnage diverted x cost per tonne) ²⁷	Cost per tonne	Cost per household	Greenhouse gas emission savings – tonne CO ₂ -e) ²⁸
A	Green waste only • Windrow composting	Household	8,750	0	\$700k-\$890k	\$80-\$100	\$70-\$101	Up to 3,100
B	Food waste • Wet digestion • Aerated static pile composting • In vessel composting • Vermicomposting • Dry digestion	Household and commercial	17,730	5,680	\$2.3M-\$3.6M	\$100-\$150	\$71-\$106	9,050 – 12,600
C	Green waste, food waste (mixed collection) • Aerated static pile composting • In vessel composting • Dry digestion	Household and commercial	26,560	7,760	\$4.4M- \$5.3M	\$125-\$150	\$86-\$190	12,950 – 18,250
D	Green waste, food waste (separate collections) • As for A and B	Household and commercial	26,560	7,760	\$3.0M-\$5.3M	Green: \$80-\$100 Food or combined. \$100-\$150	\$140-\$210	12,950 – 18,250 (note collection emissions for two collections not included)

²⁵ Projected tonnage based on population growth for the three council areas to 2033. Capture rate of materials applied – 50% for all households, 70% for commercial.

²⁶ Includes food and green waste from households including out of District material to Spicer Landfill and material from Upper Hutt.

²⁷ Costs based on projected tonnages for 2033, cost range presented at present day (2023). Cost based on tonnage of household and commercial tonnage.

²⁸ Emission savings based on household and commercial organics processing tonnages for 2033.

6.4.2 Other considerations for processing

Aside from cost and greenhouse gas emissions the following must also be considered with regards to processing technologies: diversion from landfill, technical risk, flexibility, markets and environmental impacts. The Business Case will further explore the processing technology options.

6.4.2.1 Diversion from landfill

The amount of new diversion of organic material from landfill disposal. Material captured at the kerbside and also the ability to capture other organic material dropped off at transfer stations or directly at the tipface that is not currently being diverted away from landfill.

It is worth noting that there is the ability to capture organic materials from other sources for example: non-council controlled materials from privately collected rubbish collections within the three council areas and rubbish collections undertaken outside of the councils areas but with the waste ending up at one of the three council owned landfills.

6.4.2.2 Technical risk

The level of risk associated with a processing technology is based on track record and its application both internationally and within New Zealand. Lower technical risk is generally assigned to proven technologies already in operation within New Zealand. Technical risk also considers how technical the process is, for example: windrow composting has a lower complexity to anaerobic digestion for example.

6.4.2.3 Flexibility

The ability of the technology to adjust to changes in incoming material type and quantity, for example seasonal changes in green waste. Flexibility can also be considered in regard to output products from processing technologies. For example the ability to adjust products to suit market demand.

6.4.2.4 Markets

Further work is required to understand the availability of markets suitable for products produced from the processing technologies. It is recommended to leave the selection of the processing technology to a procurement process. At that stage, the ability to identify and secure suitable markets will be a key component for respondents.

Access to markets will be a function of a number of factors including:

- Ease of use (transport, application, any approvals required for use).
- Nutrient value.
- Cost.

6.4.2.5 Environmental impacts

The impact of the processing technology on the surrounding environment through the potential impacts to air and water. For example, enclosed systems, where there is containment of odour and water (leachate) from processing are likely to be preferred when compared with processing of uncontained organic materials. This is given the potential for uncontained organic material to cause adverse environmental impacts where effective mitigations are not in place.

6.4.3 Location

When the location of a new facility is being considered, a number of questions need to be answered and depending on the technology, the answer may be different. These questions include:

- Area required for processing.
- Existing location options available in/ just outside of the region.
- Land characteristics – i.e. slope, nearby receptors.
- Buffer distances.
- Distance from collection areas.
- Consenting and building requirements.
- Layout possibilities – enclosed etc – links into the above.
- Proximity to markets.

It may be possible to establish new or additional processing activities at an existing organic materials processing facility. Examples may include:

- Other existing windrow composting operations.
- Composting New Zealand – existing windrow composting in Kapiti (Otaihanga) and Wairarapa (Masterton).
- Paranui Organics – existing windrow composting in Horowhenua (Foxton).
- McMud Earthworks – existing windrow composting in Wellington (Grenada).

A new facility would require significant space (to allow for suitable buffer from neighbouring activities) and ideally be located close to areas where materials are collected and/or to markets for products and energy (from anaerobic digestion). Where significant transport of collected materials or product are required, consolidation or other measures to optimise transport costs may be required.

6.4.4 Consenting and building permits

Each processing technology option (for example vermicomposting or in-vessel composting) needs to be considered within the context of the relevant rules and requirements of the applicable regional and district plans.

Consenting implications are highly dependent on the location of the site as well as the design of the processing technology and a comprehensive analysis of consenting requirements will need to be undertaken upon final site selection. The potential consenting requirements are considered for the purpose of processing technology comparison and analysis only.

Key matters to consider will include:

- Odour, particularly for food waste and other high nutrient feedstock.
- Storage and stockpiling of compost.
- Water management, to avoid the discharge of high nutrient or sediment loads.
- Material logistics – heavy traffic movements to/from the site.
- Management of potential contaminants in feedstock.
 - Physical contaminants like plastics.
 - Noxious weeds in green waste.
 - Chemical contaminants.

Table 6.4 provides an overview of some of the consenting requirements that different processing technologies are likely to require and will be further considered as part of the Business Case.

Table 6.4: Summary of consenting and building permit requirements for each processing option

#	Option	Potential consenting requirement
1	Open Windrow	- Land use consent - Discharge consent (to air, land and/or water) - Cultural impact assessment - Water permit (potential)
2	In-vessel composting	- Land use consent - Discharge consent (to air, land and/or water) - Cultural impact assessment
3	Anaerobic digestion (dry)	- Land use consent - Discharge consent (to air, land and/or water) - Cultural impact assessment
4	Anaerobic digestion (wet or dry)	- Land use consent - Discharge consent (to air, land and/or water) - Cultural impact assessment

Note: consenting implications are dependent on location

7 Next steps

The next steps following this report are to take forward the four collection options below into the Business Case for evaluation:

- Green waste only.
- Food waste only.
- A combined green and food waste collection service.
- Collection of both green waste and food waste, but via separate collections.

Glossary

Term	Definition
Anaerobic digestion	The process through which bacteria break down organic matter without oxygen.
Buffer distance	The distance between the processing facility and people or property that may detect odour.
Bulking agent	Carbon rich material that provides a food source for bacteria to aid in the breakdown of organic materials.
Business case	Detailed assessment that defines, assesses, and recommends an option/s.
Circular economy	The circular economy is an alternative to our traditional linear economy based on three principles: eliminate waste and pollution, circulate products and materials, and regenerate nature.
Community scale composting	Includes provision of composting facilities (generally processing, not collection or sale of compost) tending to take place at community gardens, public facilities including schools, marae, community centres. Usually compost processing is provided as an ancillary activity to the primary activity or purpose, or it is an internally funded in-house system exclusively for processing the organic materials generated on-site.
Compost	The processing of organic materials through an aerated pile system to produce a nutrient rich soil amendment. Compost also refers to the end product of this process.
Diverted material	Anything that is no longer required for its original purpose and, but for commercial or other waste minimisation activities, would be disposed of or discarded.
Feedstock	Raw material to supply a process including but not limited to vermicomposting, composting, and anaerobic digestion.
Food and garden combined (FOGO)	A collection which involves both food and green waste being collected together.
Food waste (FO)	Food waste comes from food that is not eaten. This includes household kitchen scraps and food that is produced but not consumed. It also includes commercial waste created during production, processing, distribution, and the sale of food.
Green waste (GO)	Green waste includes grass cuttings, hedge clippings, tree trimmings and other vegetation. This is sometimes also referred to as garden waste.
Greenhouse gas emissions	Gases that trap heat in the atmosphere and contribute toward the effects of global warming including carbon dioxide, methane, nitrous oxide, and fluorinated gases.
Key considerations	Considerations employed in the evaluation of options including technical risk, capital cost and greenhouse gas emissions.
Landfill	Facility for the final controlled disposal of waste in or onto land.
Level of service	The ability of Council to deliver arrangements for meeting the needs of communities within its district or region for good-quality local infrastructure, local public services, and performance of regulatory functions in a cost-effective manner.
Long term plan (LTP)	Sets the direction for the next 10 years of Council activities, outlining investment and funding of these.
Material stream	A subset of waste e.g., commercial waste, green waste etc.
Organic material	This type of material includes green or garden waste and food waste as well as other degradable materials such as biological sludges (from wastewater treatment), paper, cardboard, and timber.
Organics processing	Processing of any organic waste, including but not limited to composting, anaerobic digestion, and vermicomposting.

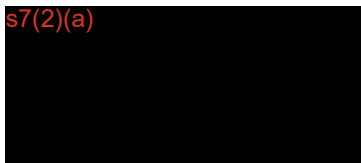
Term	Definition
Product stewardship	Taking responsibility for the products we use e.g., responsible disposal or recycling of a product and/or designing a product which can be broken down into recyclable or reusable components.
Recovery rate	Percentage of extraction of materials or energy from waste or diverted material for further use or processing including making waste or diverted material into compost.
Recycling	The reprocessing of waste or diverted material to produce new materials.
Refuse	An alternative name for rubbish. Material with little other management options other than landfill.
Requirements	A necessary condition. In this context relative to consenting, legislation and processing.
Rubbish	Waste, that currently has little other management options other than disposal to landfill.
SWAP	Solid Waste Analysis Protocol. Captures a snapshot of waste composition at a single point in time across a small subset of the larger population.
Technology	Methods for processing organic waste e.g., composting, anaerobic digestion or vermicomposting.
Waste	Means, according to the WMA: a) Anything disposed of or discarded, and b) Includes a type of waste that is defined by its composition or source (for example, organic waste, electronic waste, or construction and demolition waste); and c) To avoid doubt, includes any component or element of diverted material, if the component or element is disposed or discarded.
Waste audit	A snapshot of waste composition at a single point in time across a small subset of the larger population. This term may be used interchangeably with SWAP in the context of this report.
Waste hierarchy	A guide to prioritising activity, focussing on reducing waste before recycling or recovery of materials. Where materials cannot be recycled or recovered the focus is on safe treatment and disposal.
Waste levy	A charge of \$50 per tonne of mixed municipal waste disposed of at a class 1 landfill. The waste disposal levy raises revenue for initiatives to reduce waste and encourage resource recovery (e.g., composting and recycling).
Waste levy funding	Funding Council receives through the Waste Minimisation Fund.
Waste minimisation fund	A fund administered by the Ministry for the Environment which is generated through the waste levy (a charge added per tonne of waste that raises revenue for initiatives to reduce waste and encourage resource recovery).

9 Applicability

This report has been prepared for the exclusive use of our clients Porirua City Council, Hutt City Council, Wellington City Council, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

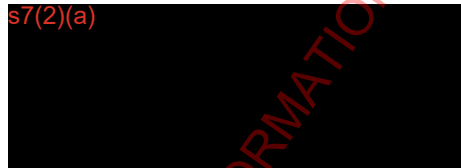
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Appendix A Preliminary stakeholder engagement

Please note that the below is a reflection of the discussions held with a number of organisations and may not be a reflection of all organisations.

Appendix A Table 1: Key stakeholder engagement themes

	Businesses	Community Groups	Waste Processors
Barriers	Collections are not frequent enough (waste becomes odorous/ a nuisance). Collections are too costly. Bin sizes do not suit the needs of the business.	Behaviour change is required in order to encourage the right behaviours to enable waste reduction. The demand for compost exceeds the quantity of compost produced from the organics materials currently accepted for processing. Requirements to ensure compliance with health and safety legislation.	Lack of storage for organic materials before processing. Especially during summer months due to larger quantities of garden waste. Difficulty in securing appropriate land for organics waste management and also gaining the required consents. Increases in waste levy (cost for landfill) may drive contamination (for example garden waste collections being used for the disposal of unaccepted materials for organic material processing) and devalue compost.
Opportunities	A need for behaviour change to reduce waste Support responsible waste management and minimisation. Would support/ continue to support a community scale initiative relative to organic materials (food rescue, community compost etc). Request for exemptions and/ or opt in services for those businesses already close to zero. New services would need to be cost effective to compete with existing services.	See a need for behaviour change to reduce waste. Encouraging of greater connection and coordination between groups and Councils.	See a need for behaviour change to reduce waste. Have capacity to process more organic material. Would like to work with Council regarding organic material management.

Appendix B Organic material management approaches

B1 Waste Hierarchy

One of the six guiding principles of Te rautaki para Waste Strategy (2023) is to *apply the waste hierarchy preferences to how we manage materials*.

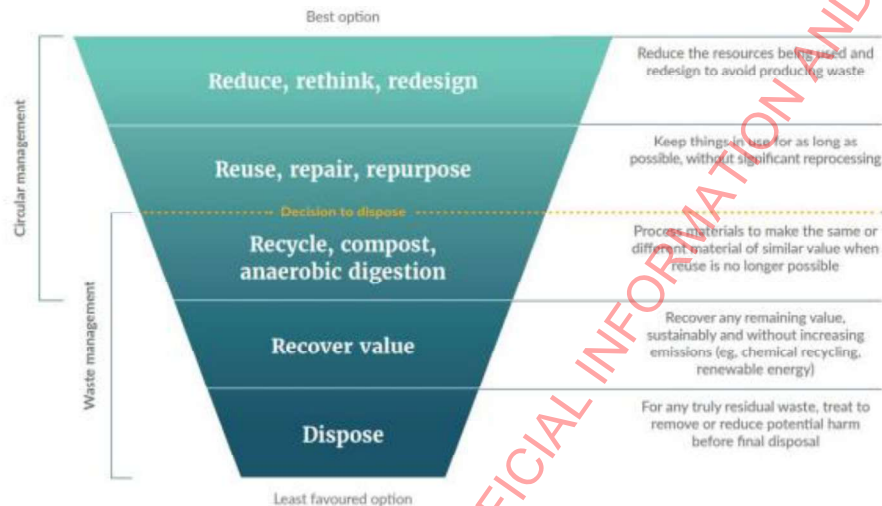


Figure 1 9-1: Waste Hierarchy, MfE (2023), Te rautaki para Waste Strategy.

The hierarchy included in Te rautaki para is separated into two sections; those options that occur prior to deciding to dispose of a material, and those that occur post. Options higher up the hierarchy tend to provide the best overall social, environmental and economic gains.

Using the waste hierarchy framework, the approach to managing organic material in order of preference include:

- Reducing the resources being used and redesign to avoid producing waste.
- Keeping things in use for as long as possible, without significant reprocessing.
- Processing materials to make the same or different material of similar value when reuse is no longer possible.
- Recover any remaining value, sustainably and without increasing emissions (e.g. chemical recycling, renewable energy).
- Treating to remove or reduce potential harm before disposal of any truly residual waste.

B2 Option development overview

Once produced, organic material in many cases is included as part of the residual waste stream and sent to landfill. This reflects the lack of convenient alternatives available to residents and businesses beyond source reduction and community diversion initiatives as advised by a number of territorial authorities.

For the purposes of this options analysis, we have considered a range of options for managing food and green waste generated across the three council areas from residents and businesses.

Options have been considered with respect to its ability to handle current and likely future waste quantity and composition. The organic material recovery and disposal options discussed in the following sections are presented in order of waste hierarchy preference, noting that not all levels of the waste hierarchy are examined in detail in this report.

Using the hierarchy presents an opportunity to address an issue particular to organics: high water content mean materials can be heavy for a given volume. The typical high water (almost 70% of average organic material) means that options with no or minimal transportation of organic material are often attractive options for organic materials management.

In some cases, organic material can be managed at household or business level through small scale approaches such as composting or worm farming. Employing these options will create a material of value when reuse is no longer an option.

In most cases (but not all) where onsite management is not an option, before materials can be processed they need to be 'collected' in some way. There are a number of options for the 'collection' of organic material from residents and businesses. These include:

- Council or private collections - garden waste and/or food organics.
- Local collection points e.g. organics collection point for apartment buildings or for communities.
- Centralised collection points, for example Council or private sector transfer stations/recycling facilities.

A functioning 'system' requires collection, processing and markets with one or more activity under each heading.

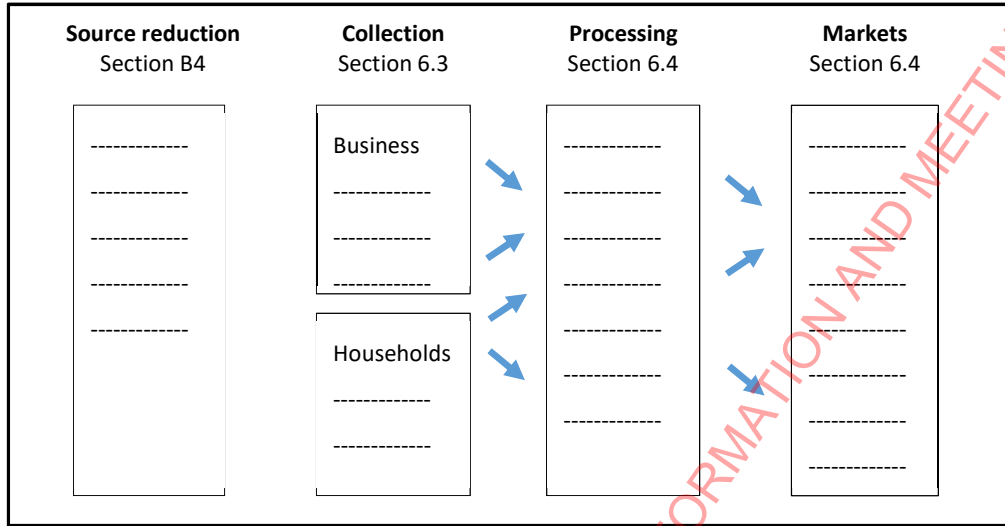


Figure 2 9-2: Organic materials recovery system components

B3 Consideration of circular economy

The Ellen MacArthur Foundation circular economy system diagram (see below), known as the butterfly diagram, illustrates how continual flow of materials look in a circular economy. This diagram explores the technical cycle (in blue) and biological cycle (in green) where the value from materials or nutrients are extracted and the principles of the waste hierarchy are implemented.

The ideal scenario reflects the concept of a circular economy where nutrients and organic matter in the organic material is used to maintain soil health and becomes incorporated into a product/s. This may include the recovery of energy as part of re-processing of materials, for example via utilisation of biogas produced through anaerobic digestion. Alternative scenarios that do not attempt to extract value from organic material represent a linear approach, where organic materials are disposed alongside other waste types in a landfill.

The nutritional content, structure, moisture retention and other key soil properties differ depending on the inputs, collection approach and processes used, and therefore the most suitable end market applications differ.

The overarching theme is that quality and uncontaminated inputs make the best quality outputs for end market reuse. This means that the way that materials are collected is a critical component of securing sustainable markets for organic material derived products.

Processing approaches produce end products of varying physical characteristics, quality and potential end market use. Organic materials processing outputs can be thought of as a range of soil improvers. Many processing system outputs require processing, transportation, maturation, blending and screening prior to reaching appropriate standards for application. As is the case for collection, processing has a critical role in enabling sustainable end markets.

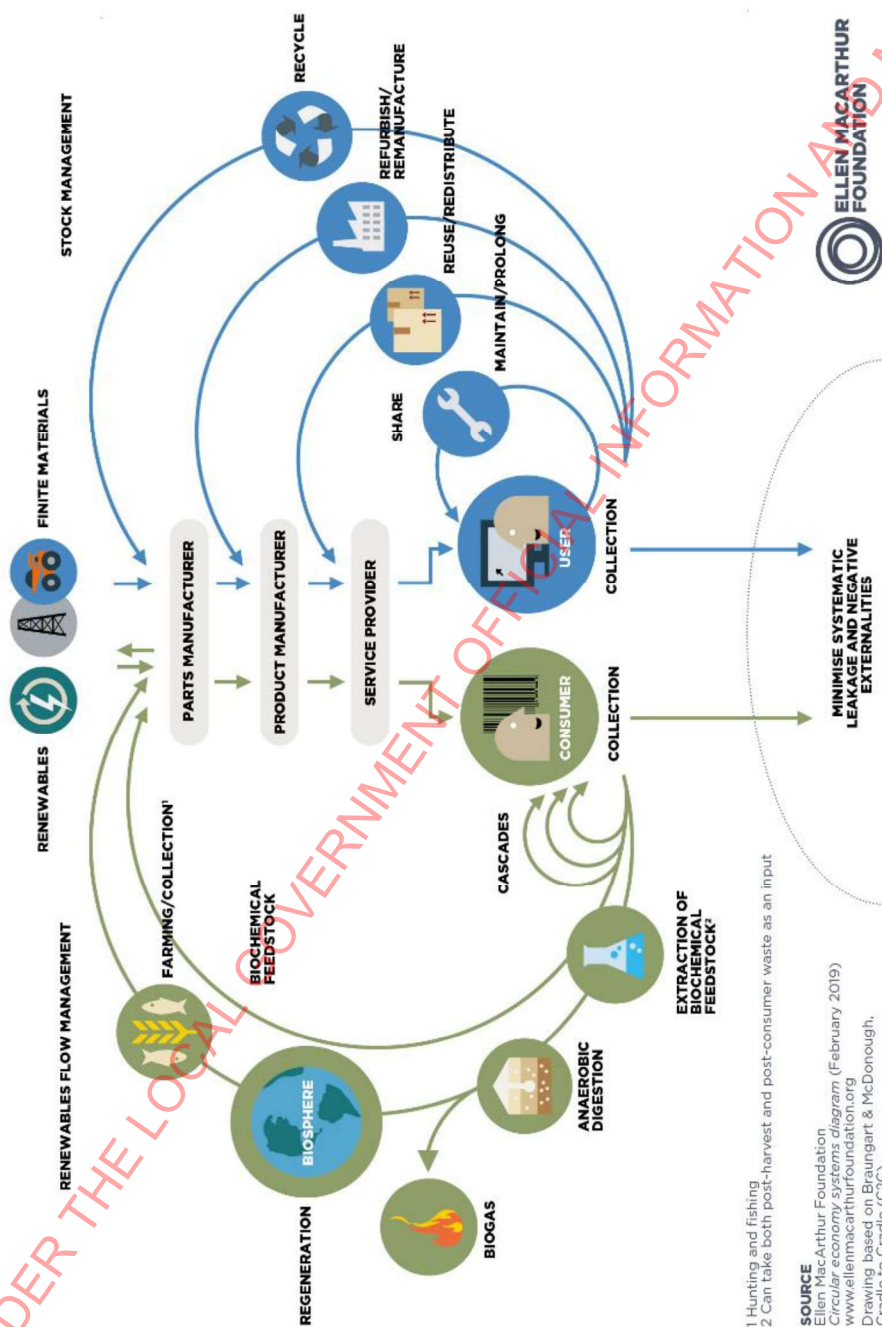


Figure 3 9-3: Ellen MacArthur Foundation, Circular Economy system (Butterfly diagram)

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The organic material recovery and disposal options discussed in the following section are presented in the order options are considered in the waste hierarchy, starting with reduction, then reuse, recycling/recovery and then disposal. Not all levels of the waste hierarchy are examined in detail in this report.

B4 Source Reduction

B4.1 Reducing organic materials generation

The Love Food, Hate Waste campaign being run at a national level and supported by the three councils is a good example of this approach. Other examples are referenced in the relevant sections below.

Nationally, there are a number of behaviour change campaigns that encourage source reduction. These include, but are not limited to, Love Food Hate Waste NZ and Zero Food Waste Challenge. Love Food Hate Waste NZ provide recipes, tips, and storage advice that equip people to reduce the food waste they create. They have also partnered with New World supermarkets to produce seasonal meal plans designed to be zero food waste. People may engage with these meal plans on the basis of cost-reduction, reducing waste inadvertently.

The Zero Food Waste Challenge provide similar resources via their pocket guide. These resources may be beneficial to supplement any behaviour change initiatives driven by the councils.

At a national level, businesses are encouraged to reduce food waste via voluntary commitments including the 'Kai Commitment', driven by NZ Food Waste Champions 12.3. This space continues to evolve and is less developed when compared to behaviour change campaigns for individuals and households.

The councils provide a range of their own behaviour change resources including online videos (WCC). The majority of these resources focus on managing organic materials, rather than source reduction. There is an opportunity for the councils to develop upon these resources independently, or collectively, depending on resourcing and budget requirements.

The councils also provide resources to businesses that may enable them to reduce organic materials. For example, WCC has the dedicated webpage "Reduce your business food waste".

The councils are actively working with residents and businesses to reduce the generation of organic material. For the purposes of this Options Report, it is assumed that **this activity will continue**.

B4.2 Managing organic material at its place of creation/on site

While not reducing the generation of organic material, encouraging residents or businesses to manage organic material on site or within their operation appropriately (if and where appropriate) avoids the need for council or a third party to collect, process and/or dispose of the material.

Home composting initiatives take the onus away from councils to provide infrastructure and staff to process organic materials. Instead, favouring a more circular, local approach utilising education and engagement programs.

Home composting involves the accumulation of food and other organic material that is then processed into a compost, worm farm, or bokashi system at the household where the waste was created. The type of system the household employs will be dependent on the amount of available space, the number of people in the home, and how involved the household would like to be in managing their food waste.

While each system produces a unique output, each is beneficial to the soil and can be used by the household, providing a circular solution to managing organic material. The quality and amount of output these systems create will be dependent on the level of activity, inputs, rainfall, season, and engagement and knowledge of those running the system.

While the councils cannot control many factors, they can increase knowledge and engagement with these systems. In some cases, participation is encouraged by councils by subsidising the required equipment or providing free or low cost training.

For individuals not able to engage in their own compost system, online networks such as ShareWaste NZ allow for small scale local networks to be established. These online networks connect individuals wanting to divert their own organics to those with capacity in their own home or community composts. These networks are well suited for urban environments where individuals may not be able to establish compost systems of their own and transport distances are short.

The councils already encourage residents and businesses to manage organic materials on their own sites. For the purposes of this Options Report, it is assumed that **this activity will continue**.

B5 Collection of organic materials

B5.1 Collection options

In New Zealand, Australia, the UK and Europe, a variety of collection arrangements exist to capture organics at the kerbside from households and commercial properties. Larger generators of organic materials have access to on premise collection systems, for example bins in commercial kitchens or bulk containers at large scale food processors.

In New Zealand, the most common model used across all kerbside collections, including larger councils, is via wheeled bins ranging from 240 L to 23 L containers (see below). Larger bins are predominantly collected via semi or fully automated side loader vehicles while smaller containers may be manually emptied.

In New Zealand, organic materials at a household and commercial scale are generally collected via

- Food only (FO) from households 23L bins (may or may not include liners and/or caddies).
- Food only from commercial kitchens in larger bins (80-240L).
- Food processing waste in sealed bulk containers (up to several m³ capacity).
- Food and garden organics (FOGO) in 80-240L bin options.
- Green waste only (GO) typically in 240L bins (see below).



Figure 4 9-4: 23L bin (left). 80, 140, and 240 L bins (right).

Where large quantities of materials are generated, for example at large processing sites, organic materials are typically moved in sealed bulk containers. Where materials are processed on site, conveyors or pumping may also be used if appropriate.

Collection frequencies vary depending on the type of organic material being collected and also the nature of the source. In some cases, separate collection of organic materials are accompanied by reduced collection frequency for residual waste.

Kitchen caddies are often provided where collections target food waste from households. The provision of a small bin for capturing and transferring food waste to the collection container improves convenience and therefore material capture.

Wheelie bins and Front load bins (FLB) are available in a range of sizes. Smaller wheelie bins are suitable for kerbside collections. Large wheelie bins are suitable for multi-unit dwellings and commercial quantities of materials including from areas with restricted heavy vehicle access. FLB are suitable for commercial quantities of waste, in some cases including multi-unit residential buildings. Front load vehicles require suitable access including height for emptying bins over the vehicle cab.

Appendix B Table 1: Collection options

Container	Target material				Collection approach		
	Food waste	Green waste	Food and green	Other materials	Manual empty	Automated empty	Multi-point/bin swap
Kitchen caddy (e.g. 5L)	✓	✗	✗	✗	NA, for transfer to collection container		
Small bin (23L)	✓	✗	✗	✗	✓	~	✓
Wheelie bin (80-360L)	~	✓	✓	~	✓	✓	~
Wheelie (>360L), FLB (1.5 – 4.5 m ³)	~	~	~	~	✓ (rear load)	✓ (front load)	✗
Bulk bin	✓ (large scale)	✓	✗	✓	✗	✓ (gantry truck)	✓
Frequency	Weekly	Various	Weekly or fortnightly	Various	As required		

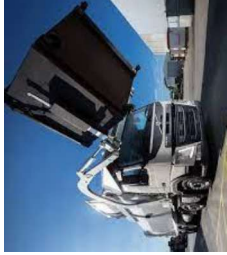
All collection options are considered potentially relevant, in various combinations.

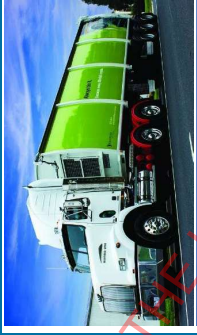
- Kitchen caddies are suitable for combination with household food and food and green waste collections.
- Small bins (80L) are suitable for food waste collections from households and small businesses.
- Wheelie bins (80 – 240L) are suitable for green waste and food and green waste collections from households and small collections. They are also suitable for food waste collection from hospitality businesses.
- Larger wheelie bins and FLB are suitable for food waste collections from large food waste generators.
- Bulk bins (skip bins) are suitable for large scale food waste (and other organic materials) and bulk green waste collection.

Appendix B Table 2: Household and commercial organic materials collection systems

Containment	Collection method/ vehicle examples	Description	Collection frequency	Examples
Multi-point collection ("Milk run") 		Small collection vehicle, such as a bikes or a van. A key characteristic is the swapping of containers rather than emptying containers into a larger container on the vehicle. This operation is often utilised for collection of smaller multiple loads which are some distance away from each other. It may be necessary to have more than one crew member, depending on the type, weight and size of the containers being used. This option offers flexibility to suit the scale of the operation.	Collection occurs between 9am and 5pm, days vary between hubs and customers. Drop-offs available at least once per week.	Kaioycle, Wellington City. Community Compost, Nelson.
23 litre bin ²⁹ , Wheelle bin 55-65 litres ³⁰  Larger bins (up to 660 litres for commercial kitchens or similar operations ³¹) 		In New Zealand, the 23 litre FO bin is the predominant system for food organics collection from households. Household FO collections are generally collected in a dedicated truck and the small bins are loaded on to the truck by hand. This system is not suitable for combined food and green collections. This system can be applied to areas of high-density properties, where little to no garden waste is requiring capture, or the collection is focused on food organics only. Commercial food organics (in larger bins) may be collected using side or rear load vehicles. Bin liners are used for some collections – to avoid or reduce the need for cleaning of bins. These are typically compostable plastics but in some cases system users are encouraged to use newspaper or similar materials. Acceptance of these materials varies by processing facility with compostable materials typically not suitable as inputs for organics certified products.	Weekly collection from households reduces material becoming anaerobic (smelly) through bacteria using up available oxygen. In addition to odour, anaerobic conditions create a poorer quality output of soil improver. A plastic kitchen caddy (pictured in column 1) is often used in the kitchen and is emptied into a larger container (23 litre bin) for collection. More frequent collections for larger bins from commercial kitchens.	Hamilton, Auckland, New Plymouth, Tauranga
80 – 240 litre food and garden organics (FOGO) for household properties ³²  Garden organics (GO) in 240 litre wheelle bins 	Side loader wheeled bin collection 	Wheeled bins are usually collected using automated/remote lifting systems and the system is most commonly operated by a single operative. This approach is not suitable where there are height restrictions because the bins are lifted over the truck for emptying. For areas where access is restricted (due to height or narrow streets), rear load vehicles may be used. Organic materials left for more than a week are more likely to enter the anaerobic state, which compromises the quality of any resultant composted materials produced for reuse. Green and food waste can be compacted providing transport efficiencies. Side and rear load vehicles typically provide for the material to be compacted in the vehicle, giving higher collection round efficiency than the stillage type operation. Kitchen caddies for use inside the home can also be procured with aerated lids and/or bodies, which can further assist by starting the dewatering process earlier than where a non-aerated caddy is used. There are additional gains to the approach when transport and logistics is factored in. Put simply, the least water that needs to be picked up in bins and transported, the better.	Commercial properties may have daily collections, or multiple collections per week. Weekly or fortnightly basis (household collections). Weekly collection of food organics for households is recommended as it reduces the chance of odour, maggots and related complaints, and gives rise to better nutrient content in any resulting composted materials.	Garden waste and mixed food and garden waste collections in Whakatane, South Taranaki, Christchurch, Selwyn, Timaru, Waimakariri.

²⁹ <https://www.officeworks.com.au/shop/officeworks/p/source-separation-systems-organics-caddy-23l-srorgc23b>³⁰ <https://www.dicksmith.com.au/da/buy/cheap-as-chips-eco-wheelle-bin-55l-black-w-coloured-lid-kb216/>³¹ <https://www.paramountbrowns.com.au/products/wheelle-bin-660ltr-green/>³² https://www.equip2go.com.au/80l-plastic-wheelle-bin-ngb80-colour-green?gclid=CjQKQCAveebBHD_ARISaAaAvr1Bv1385-mTVLFI9sIKIBVTHrZ_gZlIV-Myr9G3E5v6H0aAYKEALw_wcB

Containment	Collection method/ vehicle examples	Description	Collection frequency	Examples
This configuration is most appropriate for commercial applications as it can lift the larger 660 L and 1,100 L bins and/or where there are height restrictions. 		Bins can be procured which include aeration vents, which in turn helps to remove water from the contents (reducing weight) and keep the material aerobic. Aeration can also help to prevent unpleasant odours. The provision of aerated bins and caddies is a consideration for the councils. This is an opportunity for the industry sectors which produce high water content waste for processing. Small wheeled bins can suit the needs of apartments where there is generally less space for storage of bins or containers within the property. In this case emptying of a kitchen caddy of around 7 L size can often mean service users need to take the caddy to the larger individual or shared bins at ground level. In low-to-medium rise developments, this can mean traversing flights of stairs to navigate the 1-4 floor journey. This operation involves using a collection truck with combs fixed to the rear and a lifting mechanism for emptying bins into a hopper for transfer into the body of the truck. This system is used in relatively few organic kerbside collections due to the need for two or three operatives (driver and one or two 'runners'). Rear loaders are suitable for difficult access scenarios as noted above. Other issues include safety risk (manual handling and multiple truck entry and exit events every day) and the slow speed of the operation (a risk falling on the contractor through the delivery of the service contract). The larger bins are commonly used in multi-unit residential developments, mixed use developments, and commercial applications. AS for smaller bins, aerated configurations are available. This type of system is suited to collecting source separated organics on a larger scale.		Commercial collections across New Zealand for food waste (Kai to Compost), mixed waste and recycling
Bins of 1.5 m³ - 4.5 m³ capacity		This is a system that can be operated by one operative and is most commonly used in larger commercial applications. Front loader vehicles are utilised with bins emptied by the vehicle picking up the bin and lifting it over the top of the cab in order to place the contents in a hopper. Due to efficiency for larger scale waste streams, front load collections are most suited to large scale services such as schools, hotels, hospitals, larger commercial premises, and waste transfer stations. They require space for bin storage and access for collection vehicles with significant height clearance for emptying of bins.	Commercial properties may have daily collections, or multiple collections per week.	Commercial collections across New Zealand for mixed waste and recycling

Containment	Collection method/ vehicle examples	Description	Collection frequency	Examples
Transport to the processing site – bulk haulage	 	Direct haul refers to the practice of each individual side loader, rear loader, front lift vehicles taking their load directly to the processing site as soon as they are fully loaded. The loads are not agglomerated therefore this arrangement tends to offer less logistics efficiencies than bulk haulage. However, direct haul is often utilised where there is no transfer station available, the processing site is nearby and/or and it is necessary for the trucks to directly transport the materials to the facility on demand. Bulk hauling refers to the practice of all collection vehicles returning to their single depot once full, and the material then being lifted via a front-end loader, standard build packing machinery, or custom build packing machinery, into a larger truck for bulk transport. Depending on start and end point rail transport could also be employed.	For bulk haulage of materials after consolidation at transfer station or similar bulking facility.	Transport of food waste from New Plymouth to north Waikato (Hampton Downs Organics Facility) for processing.

B5.2 Collection implementation considerations

Introducing an organic materials collection for businesses and/or residents provides an opportunity to consider arrangements for the removal of general waste. A well designed collection approach should reduce waste requiring removal of around 30% or more, presenting an opportunity to adjust capacity and or collection frequency.

Key collection system design considerations include:

- Capacity and collection frequency for organic materials and residual waste.
- Arrangements for multi-unit developments.
- Supporting features:
 - Kitchen caddies for food waste.
 - Caddy and bin liners.
 - Education and information for system users.
 - Enforcement.
- Charging models:
 - Rates funded.
 - Opt in/opt out.
 - User pays.

If the councils decide to introduce a household organic material collection, planning the system roll out will be a critical task. At this early stage, making adequate provision for planning and executing a system roll out is a critical factor in overall system success.

Appendix C Cost assumptions and greenhouse gas emissions assumptions

C1 Cost Assumptions

C1.1 Total quantity household and commercial organic waste

SWAP reports:

- WasteNotConsulting. 2023. Composition of Waste at Spicer Landfill
- WasteNotConsulting. 2022. Composition of Solid Waste at Silverstream Landfill (Confidential)
- WasteNotConsulting. 2018. Composition of Solid Waste at Southern Landfill
- Sunshine Yates Consulting. 2022. Audit of Kerbside Rubbish and Recycling in Lower Hutt
- Weighbridge data provided for Spicer Landfill

Capture rates applied:

- Household – GO, FO, FOGO – 50%, commercial – 70%

C1.2 Total cost range (cost per annum)

- Total quantity in tonnes x cost per tonne
- Cost range provided.
- Example facilities including charges at sites in Wellington.

C1.3 Cost per household per year

- Example costs across New Zealand data points used.

Appendix C Table 1: Option A assumptions (collected tonnes reported for the three councils)

	Option A - green waste, household only	Data source
Quantity – households	5,070 tonnes per annum	SWAP – includes council controlled and private controlled green waste.
Quantity – commercial	0 tonnes per annum	SWAP, Weighbridge data
Total cost per annum (tonnage diverted and cost per tonne)	\$700k-\$890k	Quantity x cost per tonne
Cost per tonne range	\$80-\$100	Benchmarks
Cost per household range	\$70-\$101	Benchmarks
Emissions kg CO ₂ -e/unit	Up to 3,150 Household – up to 3,150 Commercial - 0	Emissions Factors – Composting and Anaerobic Digestion – 0.172 kg CO ₂ -e/unit and 0.02 kg CO ₂ -e/unit respectively ³³ . Calculation: baseline emissions minus projected emissions. Quantity based on processing tonnages. Note – collection emissions not included.

Appendix C Table 2: Option B assumptions (collected tonnes reported for the three councils)

	Option B – food only, household and commercial	Data source
Quantity – households	12,560	SWAP, Weighbridge data
Quantity – commercial	5,130	SWAP, Weighbridge data
Total cost per annum (tonnage diverted and cost per tonne)	\$2.3M-\$3.6M	Quantity x cost per tonne
Cost per tonne range	\$100-\$150	Benchmarks
Cost per household range	\$71-\$106	Benchmarks
Emissions kg CO ₂ -e/unit	9,050 – 12,600 Household – 3,100 – 6,900 Commercial – 2,150 – 3,050	Emissions Factors – Composting and Anaerobic Digestion – 0.172 kg CO ₂ -e/unit and 0.02 kg CO ₂ -e/unit respectively ³⁴ . Calculation: baseline emissions minus projected emissions. Quantity based on processing tonnages. Note – collection emissions not included.

³³ [Measuring emissions: A guide for organisations: 2022 summary of emission factors | Ministry for the Environment](#)

³⁴ [Measuring emissions: A guide for organisations: 2022 summary of emission factors | Ministry for the Environment](#)

Appendix C Table 3: Option C assumptions (collected tonnes reported for the three councils)

	Option C – food and green collected together, household and commercial	Data source
Quantity – households	17,630	SWAP, Weighbridge data
Quantity – commercial	7,760	SWAP, Weighbridge data
Total cost per annum (tonnage diverted and cost per tonne)	\$4.4M- \$5.3M	Quantity x cost per tonne
Cost per tonne range	\$125-\$150	Benchmarks
Cost per household range	\$86-\$190	Benchmarks
Emissions kg CO ₂ -e/unit	12,950 – 18,250 Household – 10,000 – 14,000 Commercial – 2,950 – 4,250	Emissions Factors – Composting and Anaerobic Digestion – 0.172 kg CO ₂ -e/unit and 0.02 kg CO ₂ -e/unit respectively ³⁵ . Calculation: baseline emissions minus projected emissions. Quantity based on processing tonnages. Note – collection emissions not included.

Appendix C Table 4: Option D (collected tonnes reported for the three councils)

	Option D – food and green collected separately. Household and commercial	Data source
Quantity – households	17,630	SWAP, Weighbridge data
Quantity – commercial	7,760	SWAP, Weighbridge data
Total cost per annum (tonnage diverted and cost per tonne)	\$3.0M-\$5.3M	Quantity x cost per tonne
Cost per tonne range	Green: \$80-\$100 Food or combined: \$100-\$150	Benchmarks
Cost per household range	\$140-\$210	Benchmarks
Emissions kg CO ₂ -e/unit	12,950 – 18,250 Household – 10,000 – 14,000 Commercial – 2,950 – 4,250	Emissions Factors – Composting and Anaerobic Digestion – 0.172 kg CO ₂ -e/unit and 0.02 kg CO ₂ -e/unit respectively ³⁶ . Calculation: baseline emissions minus projected emissions. Quantity based on processing tonnages. Note – collection emissions not included and there would be 2 x collection vehicles likely to be required.

³⁵ [Measuring emissions: A guide for organisations: 2022 summary of emission factors | Ministry for the Environment](#)

³⁶ [Measuring emissions: A guide for organisations: 2022 summary of emission factors | Ministry for the Environment](#)

C2 Processing emissions:

C2.1 Base Case

Annual tonnes summarised for food, garden, and FOGO waste categories for households and commercial.

Organic material tonnages are for Silverstream, Spicer and Southern landfills.

The kg CO₂-e was calculated by multiplying the annual kilogram of waste to each landfill by that landfills unique emission factor where available, and the 2022 MfE emissions factors (Table 34, <https://environment.govt.nz/publications/measuring-emissions-a-guide-for-organisations-2022-summary-of-emission-factors/>) where not.

The MfE emissions factor for food was used when calculating FOGO emissions to be conservative.

All of HCC green & food waste is processed at Silverstream Landfill.

All of PCC's green & food waste is processed at Spicer Landfill.

All of WCC's green & food waste is processed at Southern Landfill.

Transport emissions have not been included in this assessment.

UEF's applied for each landfill. Spicer Landfill – 0.525, Southern Landfill – 0.89, Silverstream landfill – 0.091.

C2.2 Future scenario

Future scenario calculated using the same tonnages as the base case.

Emissions Factors for composting and anaerobic digestion were used from the 2022 MfE emissions factors guide (Table 35).

C2.3 Difference

The difference between base case and future scenario was calculated by subtracting the projected emissions from the base case.

- Where FO + GO was collected, the emissions for each FO and GO were summed, as opposed to using the FOGO emissions.

C2.4 Additional assumptions

It was assumed that the composting, anaerobic digestion and landfilling would all occur at the same location, so there were no calculations based on distance and transport emissions differences between the processing sites.

It is noted that there may be additional emissions released from more trucks being used for the different services. In this model these emissions were assumed to be 0.

C3 Transportation emissions

Comparison between fully electric, hybrid and diesel vehicles provided.

C3.1 Vehicle assumptions

Minimum distance – 15km and maximum distance 20km.

No empty truck movements have been accounted at this stage.

All vehicle emissions have been taken from Table 58: Emissions factors for heavy good vehicles manufactured post 2015. [Measuring Emissions Detailed Guide 2020 FINAL.docx \(environment.govt.nz\)](#)

C3.1.1 Gross Vehicle Mass:

Small – 8.5 tonne

Large – 15 tonne

C3.1.2 Truck payload:

Small – 4 tonne

Large – 12 tonne

C3.1.3 Emission source

Electric vehicles – HGV BEV

Hybrid vehicles – HGV diesel hybrid

Diesel – HGV Diesel

C3.1.4 Vehicle sizes selected

Option A – large vehicles for all

Options B – small vehicles for all

Option C – large vehicles for all

Option D – GO only – large vehicle, FO – small vehicle



Climate Change and Sustainability Committee

30 October 2023

Report no: CCASC2023/5/340

Organics Business Case

Purpose of Report

1. The purpose of this report is to report back on the finalised Organics Business Case.

Recommendations

That the Committee:

- (1) notes the Organics Business Case is attached as Appendix 1 to the report;
- (2) notes that a combined food and green organics (FOGO) kerbside collection service is the preferred methodology to collect this waste in Lower Hutt;
- (3) notes that the proposal to introduce a FOGO collection in Lower Hutt was considered by the Long-Term Plan / Annual Plan Subcommittee on 30 October 2023;
- (4) notes that Council, at its meeting on 30 October 2023, agreed to the *"the food and green organics collection budget changes Option 2b as detailed in table 3, item 21 and Appendix 2 of Report No. LTPAP2023/5/310"*;
- (5) notes consultation with the community on the potential FOGO collection (and Hutt City Council's contribution to an organic waste processing solution) will need to be undertaken as part of the Long-Term Plan consultation, in early 2024; and
- (6) notes that while decision-making is underway, Wellington City Council (on behalf of the three participating councils) has agreed to lead the market engagement and procurement process for an organics processing solution.

For the reasons outlined in the report.

Background

2. In April 2022, officers from the Hutt, Porirua and Wellington City Councils commenced work on a project to investigate options for managing green and food organic waste in the future (refer to report no: [CCASC2022/3/146 from 14 July 2022](#), page 27).
3. The project was to enable councils to have a clearer understanding of the different options for collecting and processing food and green waste (collectively referred to as organic waste) from both households and businesses in their districts.
4. In July 2022, Tonkin and Taylor Ltd were selected to help the councils develop a business case that recommended a preferred collection type and then outlined the processing options that could accompany the preferred collection type.

The effects of organic waste in landfills

Climate Change implications

5. Landfill gas is a mix of biogenic methane and carbon dioxide derived from the decomposition of organic waste in landfills.
6. Landfill gas makes up 4% of New Zealand's overall greenhouse gas emissions and 7% of Lower Hutt's greenhouse gas emissions. Fugitive gas from Silverstream Landfill alone makes up over 30% of Council's organisational emissions.

Landfill airspace

7. In 2022, officers commissioned an audit of kerbside refuse bins and a waste assessment of the Silverstream Landfill, to better understand the nature and quantity of waste entering the landfill.
8. The kerbside assessment found that an estimated 55% of all refuse from 80, 120 and 240 litre bins were organic waste. Moreover, the assessment at Silverstream Landfill found that an estimated 594 tonnes per week (23.8% of the total waste) was organic waste.

Strategic Drivers for the diversion of organic waste

Government policy

9. In March 2023, the Government released Te Rautaki Para Waste Strategy 2023 – the New Zealand Waste Strategy (the Strategy). The Strategy reinforced the Government's desire to reduce the amount of waste that is landfilled and associated emissions ([refer Waste Strategy, page 25](#)) and has set a target *that by 2030 all households in urban areas will have a food scrap collection service*.

Waste Management and Minimisation Plan

10. The eight councils in the Wellington Region are currently updating their joint Waste Management and Minimisation Plans (WMMP) for the period 2023 - 2029.
11. The draft WMMP has the following targets:
 - reduce the total amount of material requiring final disposal to landfill by 10% by 2027 and 30% by 2030, and
 - reduce emissions from biogenic methane by decreasing the total amount of organic waste disposed to landfill by 50% by 2030.
12. Furthermore, the Wellington Region has the following draft regional action:
"Investigate and/or implement options for establishment or improvement of regional infrastructure and services. This could include, but is not limited to, options for organic waste, C&D waste, biosolids, materials recovery facilities, and a region wide resource recovery network."

Options development

13. As part of the process to develop the business case, between September and November 2022, officers from Hutt and Porirua City Councils undertook preliminary stakeholder engagement with businesses, community groups, waste operators and large-scale food processors. This was to better understand the current barriers and opportunities for these organisations when dealing with organic materials.
14. As a precursor to the business case, Tonkin and Taylor were also asked to draft an *Options Report*. The *Options Report* was completed in August 2023 ([and reported to the Climate Change and Sustainability committee meeting in September 2023, page 68](#)) and identified the various collection and processing options for food and green organic waste.
15. The *Options Report* emphasised that (a) some processing options were better suited to specific collection options and (b) there were multiple trade-offs that would need to be considered when assessing processing options.

The Business Case

16. The *Organics Business Case* (refer to Appendix 1 to the report) provides a comprehensive review of the collection options and their associated processing options for the three councils.
17. Regarding collection, the *Organics Business Case* recommends that all three councils adopt a FOGO collection. The recommendation is based on an analysis that assessed options against criteria such as cost, convenience, transport emissions and overall reduction in greenhouse gas emissions.
18. Regarding processing, the *Organics Business Case* assessed the various merits of each processing option against the following criteria:
 - diversion from landfill

- greenhouse gas emissions
 - environmental impacts
 - affordability
 - capital cost
 - cultural impacts
 - flexibility
 - markets
 - technical Risk
19. While both in-vessel composting or anaerobic digestion appear to be most aligned with the Wellington region's needs, the complexities of specifying an exact organic waste processing solution means that the *Organics Business Case* could not yet stipulate the ideal processing option or technology for the Wellington region. Instead, a robust and transparent market engagement and procurement process will be required to land on a processing solution fit for the Wellington region and potentially the Lower North Island.

Next steps

20. As the development of processing infrastructure is likely to take two to three years, decisions are required on whether the Lower Hutt community and Council would want to have a FOGO collection in the future (with a possible date for implementation in July 2027). This is so that more detailed work can be undertaken, including relevant procurement processes.
21. To facilitate decision-making, the proposal to introduce a FOGO collection in Lower Hutt was considered [by the Long Term Plan/ Annual Plan Subcommittee on 30 October 2023 \(page 98\)](#). Council, at its meeting on 30 October 2023, agreed to "the food and green organics collection budget changes Option 2b as detailed in table 3, item 21 and Appendix 2 of Report No. LTPAP2023/5/310".
22. Consultation with the community on the potential FOGO collection (and Hutt City Council's contribution to an organic waste processing solution) will need to be undertaken as part of the Long-Term Plan consultation, in early 2024.
23. While decision-making is underway, Wellington City Council (on behalf of the three participating councils) has agreed to lead the market engagement and procurement process for an organics processing solution (due to the lead times involved). The initial focus is on soft-market engagement.

Climate Change Impact and Considerations

24. The *Organics Business Case* estimates that a FOGO collection will mitigate approximately 12,950 to 18,250 tonnes of CO₂e per annum (across all three participating councils). However, this estimate is conservative.

Consultation

25. No public consultation on a potential FOGO collection has yet been undertaken. However, if Council opts to include this potential service in its Long-Term Plan, consultation will be undertaken in early 2024.

Legal Considerations

26. There are no legal considerations at this time.

Financial Considerations

27. The proposal to introduce a FOGO collection in Lower Hutt, and associated opex and capex implications, was considered [by the Long Term Plan/Annual Plan Subcommittee on 30 October 2023 \(page 98\)](#).

Appendices

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REPORT



Organics Business Case

Prepared for

Porirua City Council, Hutt City Council, Wellington City Council

Prepared by

Tonkin & Taylor Ltd

Date

October 2023

Job Number

1020245 v2.0



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Document control

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Executive Summary

In response to the changing waste and resource recovery policy landscape, Porirua City Council (PCC), Hutt City Council (HCC) and Wellington City Council (WCC) have engaged Tonkin + Taylor to prepare a Business Case for Organic Materials Recovery. This business case assesses the different options for collecting and processing organic materials from businesses and households in the Wellington region.

This business case provides a preliminary view on the preferred solution for collection and options for processing organic materials. Options presented here and any conclusions will inform decisions on services, funding and any capital investment undertaken as part of each Council's Long Term Plan (LTP) process. The information will also contribute to one or more applications for grant funding from the Waste Minimisation Fund.

This business case has considered the strategic case, the economic case and implementation considerations (including financial, commercial and management cases).

In developing this business case, the project team have been guided by the objectives of the project. These are:

- Residents and businesses have access to appropriate organic waste material recovery options.
- Deliver affordable and cost-effective organic materials recovery for residents and businesses.
- Reduce the need for residual waste disposal.
- Deliver a minimum 30% reduction in biogenic methane greenhouse gas emissions by 2035.

These objectives have been reflected in a set of eight key considerations, which were developed alongside the three councils. The key considerations have been used to evaluate the options being assessed.

Organic material collections

There are around 155,750 households across the three Council areas. Current data suggests that around 76,000 tonnes of food waste and green waste from households and businesses is being disposed of at landfills across the three council areas. This includes material from outside of the Council areas. Modelling indicates that over 23,000 tonnes of food waste and green waste from household and businesses could be collected for processing. Four collection options were identified for evaluation. These are:

- a Collection of green waste only from households.
- b Collection of food waste only, from households and commercial premises.
- c Collection of green waste and food waste in a mixed collection, from households and commercial properties.
- d Separate collection of green waste and food waste, from households and commercial properties.

The evaluation of the options illustrated that there is no single option that stands out as delivering on all of the objectives for the project. The evaluation suggests a combined green and food waste collection service (Option C) best delivers a balance of benefits and trade-offs. While Option C is unlikely to be the cheapest, key benefits include:

- Maximised diversion of organic material from landfill through capturing food and green waste.
- Maximised GHG emissions reduction through avoided landfill disposal with some variation depending on the processing approach adopted.

- Flexibility to respond to users' needs and wider legislative changes.

Organic material processing

A list of six processing options have been considered for their suitability for combined green and food waste type feedstock. These include:

- Vermicomposting
- Aerated static pile composting
- Windrow composting
- In-vessel composting
- Wet anaerobic digestion
- Dry anaerobic digestion

The evaluation of the organic materials processing options has illustrated, much like the collection's options, that there is no perfect approach. On the basis that a combined food and green waste collection is preferred, a combination of processing option may be the most suitable solution. Any procurement process should focus on identifying a processing approach that delivers the desired balance between flexibility, minimising technical risk, emissions reductions and cost.

Implementation considerations

This business case has provided a detailed overview and analysis of the financial, commercial and management cases relative to the organic material collection and processing options recommended.

In outlining these aspects, the various opportunities and challenges have been highlighted to inform decision making by the three councils. The decision to pursue collection and/or processing arrangements as individual councils or collectively will directly influence on the next steps for each of the financial, commercial and management cases.

This is of particular relevance for any procurement process, and any subsequent governance arrangements. Detailed procurement planning and responses from suppliers will ultimately determine the solutions to be implemented, within the funding and performance envelope agreed through the LTP and any funding arrangements.

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1 Introduction

1.1 Background

Tonkin + Taylor Ltd (T+T) have been engaged by Porirua City Council (PCC), Hutt City Council (HCC) and Wellington City Council (WCC) to prepare a Business Case for Organic Materials Recovery addressing collections and processing on behalf of the three Councils. This work is being carried out in accordance with T+T's proposal dated 30 June 2022, contract number 101882. This business case has built on the Organic Options Report analysis for organic waste management.

PCC, HCC and WCC (the Councils) have recognised the benefit of collaborating regionally to achieve efficiencies and effectiveness in waste management and minimisation. In this business case, the Councils are looking to explore opportunities for how a regional approach to organic material recovery can improve outcomes for the individual Councils and the communities they serve.

Options presented here and any conclusions will inform decision making by the individual Councils. Decisions on services, funding and any capital investment will be undertaken as part of each Council's Long Term Plan (LTP) process. There is also potential to seek co-funding from the Waste Minimisation Fund (WMF) with the Fund seeking expression of interest for projects focussing on organic materials recovery collection and processing.

1.2 Scope

An options assessment was completed and documented in an Organic Options Report¹. The analysis considered collection and processing options across the three Council areas based on currently available information. The Organic Options Report identified a short-list of options for collection and processing of organic materials from businesses and households in Porirua, Lower Hutt and Wellington.

This business case summarises a review of costs, benefits, and risks for each of the short-listed options identified from the Organic Options Report. The options analysis takes an approach that is consistent with Treasury's Better Business Case guidance². This business case approach includes:

- **The Strategic Case** - What is the problem, issue or service need? What are the anticipated benefits from addressing the problem?
- **The Economic Case** – What is the best value for money option, is there a compelling case for investing?
- **Addressing implementation considerations** (Management, Commercial and Financial Cases) - Can the project be delivered as planned? How will the project be procured and funded?

¹ Tonkin & Taylor Limited, Organic Options Report – prepared for Porirua City Council, Hutt City Council, Wellington City Council, August 2023.

² Te Tai Ōhanga The Treasury, *Better Business Cases™ for small scale non-high risk projects*, 30 March 2021. Accessed on 21 March 2023 from: <https://www.treasury.govt.nz/information-and-services/state-sector-leadership/investment-management/better-business-cases-bbc/better-business-cases-small-scale-non-high-risk-projects>

2 Strategic case

2.1 Summary of current situation

A detailed analysis of the current situation across PCC, HCC, and WCC is provided in the Organic Options Report. A summary of the findings is provided below, material flows are illustrated in Appendix A.

- Food waste is not collected by any Council.
- HCC provides an opt in separate green waste collection, which is funded by rates.
- Current data suggests that around 76,000 tonnes of food waste and green waste are disposed of to landfill in the three Council areas.
- Modelling indicates that approximately 26,200 tonnes of food waste and green waste from household and businesses could be collected for processing from the three council areas.
- Green waste drop off charges in the region currently range from \$80.50 - \$145.60 per tonne.
- Multiple companies provide green waste collection services using wheelie bins and garden bags.
- There are two transfer stations in the district of HCC, and one each in PCC and WCC. Green waste is accepted by all four transfer stations.
- Across the three Council areas there are:
 - Nine collection operators.
 - Four food recovery services.
 - Three composting operations process green waste from the Council areas, one in Porirua (privately owned), one in Wellington (Council owned) and one company with locations in Kapiti and Masterton (privately owned).
- Each council operates one landfill each.

There are around 155,750 households across the three Council areas with kerbside collection services provided by Councils (recycling, green waste (Hutt only) and general waste) and the private sector (green waste and general waste). Multi-unit developments are serviced by the relevant Council or the private sector.

2.1.1 Key policy drivers

The policy context for the development of this strategic case is detailed in Section 4 of the Organic Options Report and summarised below. The key drivers for the strategic case include:

- Regional Waste Management and Minimisation Plan (2017-2023).

The Wellington Regional Waste Management and Minimisation Plan 2017-2023 (Regional WMMP) includes a target of diverting '34.5 kilograms per person of food waste from landfill per annum by 2026' to support meeting the overall regional target of a reduction in the total quantity of waste sent to Class 1 landfills.

Businesses and the community don't currently have access to convenient and cost-effective solutions for organic (food scraps and green waste) materials recovery.

The Regional WMMP includes an action to investigate and develop (if feasible) a region-wide resource recovery network – including facilities for organic waste.

The Regional WMMP has been reviewed and the Councils are currently working towards a new Regional WMMP. Hutt City Council is expected to be the first council to adopt the new Regional WMMP (2023-2029) on 12 December 2023. The draft plan includes objectives to have a regional organic processing facility available by 2029 to implement organic materials collection and to reduce organic waste related emissions.

- Aotearoa New Zealand Waste Strategy (2023).

The recently released *Te rautaki para Waste Strategy – getting rid of waste for a circular Aotearoa New Zealand* (the new Waste Strategy), outlines a vision that commits New Zealand (NZ) to a low-emissions, low-waste circular economy, by 2050. Phase 1 of the Waste Strategy includes actions relating to circular management of products and materials as well as actions to reduce emissions from waste. The supporting targets for phase 1 also indicate the Government's desire to reduce waste generation, disposal and associated emissions.

Given the principles of responsibility, protection and hierarchy that underpin the Waste Strategy, Councils are likely to play an important role in its delivery.

- Waste legislation.

At the beginning of 2023, in response to the Transforming Recycling³ consultation process, Central Government announced a move to standardise kerbside recycling across the country. The announcement was followed by a gazette notice (developed under the Waste Minimisation Act 2008) in September 2023 which sets out the first tranche of performance standards⁴ related to standardisation of materials collected for recycling at the kerbside. It is expected that further regulations will be developed which will make food scraps collection services available to households in all urban areas by 2030. The need for businesses to also separate food scraps from general waste by 2030, as signalled in the original announcement, is likely to be considered as part of the broader waste legislation review process.

The announcement to standardise kerbside recycling also signalled the introduction of minimum performance standards for Councils. At this stage it is unclear if these aspects will be included in the next round of regulations, however, diversion of waste from landfill, in particular organic waste, is a key priority in the new Waste strategy and the waste chapter of the Emissions Reduction Plan.

The requirements and timeline indicate that food scraps or food and garden collections may be required to be introduced in the Wellington Region by 2030. Contestable funding through the WMF and the Climate Emergency Response Fund is available to councils until mid-2024 to support planning and implementation for such services.

The Waste Minimisation Act 2008 includes provisions related to the imposition of a waste levy, which is currently \$50/tonne and increasing to \$60/tonne from 1 July 2024.

Revenue from the waste disposal levy must be used to fund waste minimisation initiatives, with the Ministry for the Environment (MfE) indicating a desire for a greater focus on improving resource recovery infrastructure. In addition to the waste levy funding received directly by Councils, they are also able to apply for funding for larger projects through the WMF. There is potential for PCC, HCC, and WCC to be able to utilise the waste levy (whether from direct levy funding or through additional WMF funding) for the implementation of organics collections and processing infrastructure.

Further to this, as part of the review of the Waste Minimisation Act 2008 and the Litter Act 1979, Central Government has also signalled that a replacement act is intended to increase regulatory powers to control products and materials, including strengthening the framework for landfill bans.

³ In reference to Transforming Recycling Consultation Document (Ministry for the Environment, March 2022), available at [Transforming-recycling-consultation-document.pdf \(environment.govt.nz\)](https://www.mfe.govt.nz/publications/transforming-recycling-consultation-document.pdf).

⁴ Standard materials for kerbside collections Notice 2023 (Notice No. 1) [2023-go4222]

Organic material may be banned⁵ in the future from NZ landfills due to their contribution to landfill gas generation and associated impacts. The loss of valuable energy and/or nutrients is also an important consideration.

- Emissions Reduction Plan (2022).

The Emissions Reduction Plan (ERP) was released in 2022 and is a mechanism to allow NZ to prepare for, and adapt to, the effects of climate change, transitioning towards a more resilient low emissions economy. The Plan sets out policies and strategies for the decarbonisation of every sector. In terms of waste, organic waste is a key focus area at both a household and business level alongside exploration of bans or limits for the diversion of organics from landfill.

This project is in line with Action 15.2.2 of the ERP, which requires appropriate processing and resource recovery infrastructure for organic waste. Additionally, Action 15.3.2 involves an investigation into whether businesses should be required to separate food waste for collection.

- Resource Management Act (1991).

The Resource Management Act 1991 (RMA) promotes sustainable management of natural and physical resources. Although it does not specifically define 'waste', the RMA addresses waste management and minimisation through controls on the environmental effects of waste management. The government is working through a reform of resource management law in NZ with a proposed Natural and Built Environments Act, Spatial Planning Act and Climate Adaptation Act.

The RMA is unlikely to have direct implications for the collection of organic material, however any changes to existing, or development of new, facilities will need to be undertaken in line with any consenting requirements under the relevant rules of the applicable regional and district plans.

2.2 Benefits statement

This business case assesses the different options for collecting and processing organic materials from businesses and households in the Wellington region. The following definitions are applicable to this project.

- **Food waste:** Food waste comes from food that is not eaten. This includes household kitchen scraps and food that is produced but not consumed. It also includes commercial waste created during production, processing, distribution and the sale of food.
- **Green waste:** Green waste includes grass cuttings, hedge clippings, tree trimmings and other vegetation. This is sometimes also referred to as garden waste.
- **Organic waste:** This type of waste includes green or garden waste and food waste as well as other degradable materials such as biological sludges (from wastewater treatment), paper, cardboard and timber.

Key anticipated benefits from reducing the amount of organic materials disposed to landfill include:

- Extension of life span for the three landfills in the study area.
- Reduced landfill gas generation as a result of organic materials breaking down in landfill:
 - A reduction in greenhouse gas (GHG) emissions resulting in environmental benefits and investment consistent with national direction including with the National Emissions Reduction Plan.
 - A reduction in costs associated with appropriately managing landfill gas.

⁵ Signalled in Transforming Recycling Consultation Document (Ministry for the Environment, March 2022), available at [Transforming-recycling-consultation-document.pdf](https://www.mfe.govt.nz/publications/transforming-recycling-consultation-document.pdf) ([environment.govt.nz](https://www.mfe.govt.nz/publications/transforming-recycling-consultation-document.pdf)).

- A reduction in Emissions Trading Scheme liabilities where reduced landfill gas generation is quantified and reflected in a unique emission factor for each landfill.
- Waste levy liabilities are reduced through reduced disposal of waste to levied landfills.
- Nutrients present in organic waste materials are kept in circulation through processing and reuse of organic materials derived from soil amendment products such as compost, digestate or mulch.
- Provision of new services and facilities to businesses and the community to support waste minimisation and enable councils to meet the relevant waste targets set by central government in the NZWS.
- Educational opportunities to learn about organic waste management for schools and the community are enhanced.

2.3 Key objectives, issues and considerations

The Organic Options Report includes a summary of the core problems and opportunities that this project is attempting to address. In response to these problems and opportunities, the following objectives were developed with the project team. The objectives of the project are:

- **Residents and businesses have access to appropriate organic waste material recovery options.**
- **Deliver affordable and cost-effective organic materials recovery for residents and businesses.**
- **Reduce the need for residual waste disposal.**
- **Deliver a minimum 30% reduction in biogenic methane greenhouse gas emissions by 2035.**

2.4 What will this business case be used for?

This business case will provide the basis for each council to make decisions on whether it wants to roll out a new service and how to process the collected material, as part of the development of the 2024 LTP, and to seek funding from several sources. The LTP process is used by each council to set out their funding priorities for the next 10 years.

This business case can also be used to support applications to the WMF. Local authorities have been encouraged to apply for funding support from central government to introduce organic materials collection and processing with specific funding available for:

- Establishing household organic materials⁶ collections with funding targeted at supporting the purchase of suitable containers (termed receptacles in the Wellington Region by-law) for collection services.
- Establishing organic materials processing with grant funding available for new processing or upgrades to existing facilities to enable processing of food organics.

While both the WMF and LTP processes require credible cost estimates for possible solutions, detailed costs, the best value for money option and implementation considerations will only become clear through procurement.

That means that this business case provides a **preliminary view** on the preferred solution for collection and preferred solution or solutions for processing to inform the LTP and WMF process. Detailed procurement planning and responses from suppliers will ultimately determine the solutions

⁶ The WMF kerbside organics implementation funding package includes funding for food and/or food and green waste organic materials collections.

to be implemented, within the funding and performance envelope agreed through the LTP and WMF funding arrangements.

3 Economic case

The focus of the economic case is on identifying the 'best value for money' option that addresses the objectives set out in the Strategic Case. As noted in Section 2.4 while this business case will take a preliminary view on preferred options, this is subject to available funding and potential alternative solutions put forward through a future procurement process.

The remainder of this section sets out:

- the approach taken to evaluate options.
- Organic material collection options and their evaluation.
- Organic materials processing options reflect the options considered from a collection's perspective.

3.1 Evaluation approach

As part of the Organic Options Report process, the below key considerations for assessing options were developed in collaboration with the councils to reflect the project objectives.

Some of these considerations are not applicable to both collections and processing, where applicable this is noted in the applicability column.

Table 3.1: Objectives and evaluation criteria

Objective	Consideration	Definition	Applicability
Residents and businesses have access to appropriate organic waste material recovery options	Technical risk	The level of risk (High, Medium or Low risk) associated with the solution is based on track record (NZ and international), complexity and supplier capability.	Processing only
	Flexibility	The flexibility (High, Medium or Low flexibility) of the solution to adjust to changes different organic materials type (i.e., food, putrescibles, commercial organics), quantity, markets, and policy framework.	Collections and processing
	Markets	The level of confidence (High, Medium or Low market risk) in markets for the output(s) from the solution.	Processing only
Deliver affordable and cost-effective organic materials recovery for residents and businesses	Capital cost	High level capital cost requirements (High, Medium, or Low capital cost) for the processing solution (s).	Processing only
	Affordability (Council, ratepayers, businesses)	Affordability (High, Medium or Low Cost) of the solution reflecting amortised capital costs and ongoing operational costs reflected in user charges or other funding arrangements.	Collections and processing
Reduce the need for residual waste disposal	Diversion from landfill	The amount of new diversion of organic material from landfill disposal (High, Medium or Low) diversion.	Collections only
Deliver a 40% reduction in biogenic methane	Environmental impacts	The risk of adverse environmental impact (air quality, water impacts) for a well-designed and operated solution (High, Medium, Low impact).	Processing only

Objective	Consideration	Definition	Applicability
greenhouse gas emissions by 2035	Greenhouse gas emissions	The anticipated net GHG emissions associated with the solution (High, Medium or Low net emissions). Calculated on a relative basis.	Collections and processing

In applying these considerations, the performance of each option against each consideration is considered. Such analysis has been done on a generalised basis, based on common knowledge of the different collection and processing options. For ease of interpretation, the assessment is colour coded to provide a visual cue for each criterion and each option. Where a criterion is evaluated as less preferred (orange or red) this is not necessarily a 'fatal flaw'. Rather at this stage the evaluation may simply highlight an area that may require further analysis if the option is progressed further. The evaluation approach and colour coding are described in Table 3.2.

Table 3.2: Option evaluation, colour coding

	Colour	Comment
		Lowest risk, lowest cost, maximum reduction.
		Options better than those with a medium risk, cost or reduction, but not the best option.
		Medium or moderate risk, medium cost or some reduction.
		Options preferred to those with a high risk, cost and/or minimal reduction.
		Requires further analysis – highest risk, highest cost, minimal reduction.

Cultural impacts are not included as a consideration in this business case. The three Councils have existing collaborative partnerships with mana whenua and clear commitments to involve Māori in decision making to improve outcomes for tangata whenua. In particular:

- WCC has the Tākai Here partnership agreement with Te Āti Awa, Taranaki Whānui, and Ngāti Toa Rangatira. This has been followed by the Tūpiki Ora Strategy and the Tūpiki Ora Action Plan 2022-2027. These agreements clearly set out commitments to collaborate with Mana Whenua and Māori.
- PCC partner with Ngāti Toa Rangatira, to honour their commitment to Mana Whenua and the Treaty of Waitangi. The Council and Te Rūnanga o Toa Rangatira have a shared Strategic Partnership Agreement that provides the opportunity for Te Rūnanga o Toa Rangatira to contribute to Council decisions and to provide leadership alongside Council for Porirua.
- HCC have developed Tākai Here, Memoranda of Partnership, with five iwi organisations and two marae representing Mana Whenua and Ngā Iwi Māori in Te Awa Kairangi ki Tai Lower Hutt. These take a covenant approach, reflect Iwi plans, and are in alignment with both Council and Mana Whenua aspirations. Council is also developing Ngā Kīwei o Te Kete (Effective Māori Engagement Strategy) which will assist Council with the development and implementation of mechanisms for effective monitoring, review, and evaluation of our

partnership with Mana Whenua. This project will use a progressive procurement policy to create better outcomes for tangata whenua.

3.2 Organic material collections

3.2.1 Organic material collection options

Section 6 of the Organic Options Report identified the collection options based on target material. Table 3.3: and Table 3.4: provide an overview of each of the collection options available including key information, which includes:

- Customer group – who will receive the collection.
- Estimated tonnage of material diverted – residential and commercial.
- Collection bin type.
- Collection frequency.
- Rubbish collection frequency following implementation of the organics collection.
- Costs.
- GHG emissions savings.

The figures presented provide a view of the anticipated capture of material based on 2022/2023 quantities and increases broadly in line with population growth across the serviced communities. This increase also applies to emissions savings across the various collection options. The costs as noted are based on 2022/23 costs and will increase over time.

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Table 3.3: material collections options

Kerbside service option	Description	Customer group	Tonnage collected at kerbside per annum (three councils only) ⁷	Tonnage diverted from landfill per annum (commercial)	Collection bin type /s (typical)	Collection vehicle type (typical)	Collection frequency ⁸	Rubbish collection frequency	Collection emissions (kg/CO2/annum), range (see Appendix C for further details)
A	Green waste only	Household	5,070	0	>80 L	Side-lifter	Four-weekly	Weekly	Electric: 550 – 800 Hybrid: 4,400 – 5,900 Diesel: 5,500 – 7,350
B	Food waste	Household and commercial	12,560	5,130	23 L food waste (household) 80 L+ food waste (commercial)	Low entry vehicle (manual)	Weekly	Fortnightly	Electric: 4,540 – 8,100 Hybrid: 34,000 – 61,250 Diesel: 42,700 – 76,800
C	Green waste, food waste (mixed collection)	Household and commercial	17,630	7,760	>80 L	Side-lifter	Weekly	Fortnightly	Electric: 2,910 – 3,880 Hybrid: 22,000 – 29,350 Diesel: 27,580 – 36,780
D	Green waste, food waste (separate collections)	Household and commercial	17,630	7,760	240 L green waste, 23 L food waste (household) 80 L+ food waste (commercial)	Side-lifter	Weekly – food waste Four-weekly – green waste	Fortnightly	Electric: 5,420 – 9,290 Hybrid: 40,760 – 70,170 Diesel: 51,100 – 87,960

Note: Mixed and green waste only collections often provide for a range of container sizes, allowing households to have smaller or larger containers to reflect their circumstances.

⁷ Excludes Upper Hutt City Council controlled organic waste as part of the rubbish collection. Excludes the organic material portion of waste received at Spicer Landfill from collections outside of Porirua.

⁸ Collection frequency may vary

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Table 3.4: Processing options, costs, and greenhouse gas emissions by organic material collection option

Kerbside service option	Description	Customer group	Total cost per annum (tonnage diverted x cost per tonne) ⁹	Cost per tonne	Cost per household	Greenhouse gas emission savings – tonne CO ₂ -e) ¹⁰
A	Green waste only	Household	\$700k-\$890k	\$80-\$100	\$70-\$101	Up to 3,100
B	Food waste	Household and commercial	\$2.3M-\$3.6M	\$100-\$180	\$71-\$106	9,050-12,600
C	Green waste, food waste (mixed collection)	Household and commercial	\$4.4M-\$5.3M	\$100-\$180	\$86-\$190	12,950-18,250
D	Green waste, food waste (separate collections)	Household and commercial	\$3.0M-\$5.3M	Green: \$80-\$100 Food or combined: \$100-\$180	\$140-\$210	12,950 -18,250 (note collection emissions for two separate collections not included)

⁹ Costs based on projected tonnages for 2033, cost range presented at present day (2023). Cost based on tonnage of household and commercial tonnage.

¹⁰ Emission savings based on household and commercial organics processing tonnages for 2033 including materials from outside Wellington, Porirua and Lower Hutt.

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3.2.2 Organic material collection options evaluation

Evaluation of the proposed organic material collections against the relevant considerations is provided in the tables below. Calculations have been derived from:

- Indicative annual cost per household (used to consider affordability) – benchmarked against costs for comparable services across Aotearoa NZ.
- Diversion from landfill – calculated from existing waste composition survey, weighbridge data and assumed capture rates.
- GHG emissions – emissions savings compared to disposal of material to landfill (baseline)¹¹.

¹¹ Emissions Factors – Composting and Anaerobic Digestion – 0.172 kg CO₂-e/unit and 0.02 kg CO₂-e/unit respectively - [Measuring emissions: A guide for organisations: 2022 summary of emission factors | Ministry for the Environment](#)

Table 3.5: Option A - Green waste only evaluation

Option A	Green waste only residential service, collected 4-weekly from a >80L wheelie bin
Overview	Collection of green waste only has been assessed as medium against all considerations, but it does not meet the strategic requirements regarding removal of food based organic material from landfill. It also is unlikely to enable councils to meet any statutory obligations regarding collections and achieving set targets. This option is the least effective with respect to minimising associated waste levy or ETS costs. A green waste only collection may induce green waste into the collection system with materials currently composted at home captured in the green waste collection. This option delivers the lowest increase in the diversion of organic waste from landfills. This reflects food waste remaining in rubbish bins/bags and the likelihood that the rubbish collection frequency will need to remain weekly. Given that this option does not deliver on the signalled mandatory food waste collection from households it should not be progressed further.
Flexibility	Poor flexibility as restricted to green waste only and therefore cannot accept food waste and putrescibles or respond to change such as mandatory food waste collection. Not suitable for properties with no garden such as multi-unit dwellings.
Affordability	Indicative annual cost per household is in the range of \$70-\$101 per annum
Diversion from landfill	Low volume diverted. Approximately 5,070 tonnes per annum from households, reflecting 50% capture of the green waste 'available' from households.
Greenhouse gas emissions	3,100 tonnes CO₂-e of GHG emissions savings anticipated reflecting reduced disposal of green waste to landfill and emissions from composting of the collected green waste. Collection emissions range associated with: Electric: 550 – 800 kg/CO₂/annum, Hybrid: 4,400 – 5,900 kg/CO₂/annum and Diesel: 5,500 – 7,350 kg/CO₂/annum.

Table 3.6: Option B – Food waste only evaluation

Option B	Food waste only residential and commercial service, collected weekly from a 23 L bin (households)
Overview	Collection of food waste only will enable councils to meet their signalled future statutory obligations regarding the removal and management of food based organic materials from landfill. However, this option does not achieve the maximum diversion possible (as it is only focused on one source of organic material) and its ability to flexibly respond to changes (for example a future ban on the disposal of green waste to landfill) is very limited. The service provision (volume and bin type) is unlikely to suit most commercial users and is likely to result in a separate collection methodology for commercial users which will increase costs. The small bins used for food waste collection (23-25 L) are likely to be problematic, with a relatively windy climate in the Wellington region. Once emptied, caddies may be blown away, contributing to operational problems. The approach also relies on a manual collection methodology, which has health and safety implications. The small kerbside bins help to manage contamination by matching available capacity with typical food waste generation. It is likely to be the cheapest service for users where food waste is collected, however, the collection methodology is expected to require upfront capital investment (in bespoke equipment) and contract costs associated with manual handling. This option involves a single collection which will help to limit transport emissions however it does not maximise the potential reduction in landfill based GHG emissions as only food based organic materials are being diverted from landfill.
Flexibility	Limited ability to flexibly respond to customer needs or legislative requirements. A food waste focussed collection system may have limited flexibility to accommodate other materials (such as green waste). For commercial collections similar materials may be able to be accommodated by the downstream processing solution (refer to Section 3.3). A food waste collection service combined with use of bag liners in a kitchen caddy will maximise recovery by reducing the 'yuk' factor and making it easier for participation by all residents.
Affordability	Indicative annual cost per household is in the range of \$71-\$106 per annum. Manual collection methodology is likely to impact contractual costs and requirements (i.e., the need for runners).
Diversion from landfill	Approximately 12,560 tonnes per annum from households, reflecting 50% capture of food waste 'available' from households and a further 5,130 tonnes from commercial sources.
Greenhouse gas emissions	9,050 – 12,600 tonnes CO₂-e of GHG emissions savings anticipated reflecting reduced disposal of food waste to landfill and emissions from Anaerobic Digestion or Composting of the collected material. Collection emissions range associated with: Electric: 4,540 – 8,100 kg/CO₂/annum, Hybrid: 34,000 – 61,250 kg/CO₂/annum and Diesel: 42,700 – 76,800 kg/CO₂/annum.

Table 3.7: Option C – Green waste, food waste (mixed collection) evaluation

Option C	Green waste and food waste mixed collection provided to residential and commercial users, collected weekly from a >80 L bin
Overview	Collection of green waste and food waste together (often termed food and garden organics or FOGO) maximises the opportunity to remove and divert organic waste material from landfill and enable councils to meet their strategic obligations. This option is likely to maximise organic material diversion as it involves collection of both garden and food based organics. A food waste collection service combined with use of bag liners in a kitchen caddy will maximise recovery by reducing the 'yuk' factor and making it easier for participation by all residents. A food and green waste collection may induce green waste into the collection system with materials currently composted at home captured in the green waste collection. There is a balance from an emissions reduction perspective, green waste currently composted at home will ideally continue to be composted at home. Capturing green waste currently disposed of to landfill for composting or digestion is preferred. This option is likely to minimise operational issues, as the 80L bin is less likely to be blown away in windy conditions, and can be serviced without relying on manual collections / runners, thereby resulting in better health and safety outcomes. GHG reduction is high as the quantity of material diverted from landfill is maximised whilst limiting transport emissions by using a single collection. Commercial users are unlikely to need green waste disposal services, however, the use of wheelie bins and the associated collection methodology enables flexibility of bin size provision for those users that need it. Processing for a mixed food and green waste stream from households is likely to also be suitable for food only materials from commercial activities. There is potential to provide services allowing for larger bins (with an associated increased targeted rate) for households wanting to dispose of larger quantities of green waste through the combined collection.
Flexibility	This approach has good flexibility, all customers have the ability to use the bin in a way that best suits their needs. Households in standalone dwellings can be provided with food and garden material collection whereas multi-unit dwellings or commercial customers can be provided with food waste collection.
Affordability	Indicative annual cost per household is in the range of \$86-\$190 per annum.
Diversion from landfill	Approximately 17,630 tonnes per annum from households, reflecting 50% capture of food and garden materials from households and a further 7,760 tonnes from commercial sources.
Greenhouse gas emissions	12,950-18,250 tonnes CO₂-e of GHG emissions savings anticipated reflecting reduced disposal of food and green waste to landfill and emissions from composting or anaerobic digestion respectively. Collection emissions range associated with: Electric: 2,910 – 3,880 kg/CO₂/annum, Hybrid: 22,000 – 29,350 kg/CO₂/annum and Diesel: 27,580 – 36,780 kg/CO₂/annum.

Table 3.8: Option D – Green waste, food waste (separate collections) evaluation

Option D	Green waste (240 L) collected 4 weekly and food waste (23 L) collected weekly from residential users. With food waste collected weekly in an 80 L or greater container from commercial users.
Overview	Collection of green waste and food waste separately maximises the opportunity to remove and divert organic waste material from landfill and enable councils to meet their strategic obligations. The separate collection makes the use of different processing approaches for each stream straightforward, potentially enabling lower cost processing of green waste (for example windrow composting). Food and Green waste (i.e., a FOGO collection) can also be separated to enable the use of different processing technologies. This is done overseas. This option is likely to maximise organic material diversion as it involves collection of both garden and food based organics. This is the highest cost option as it involves provision of two services i.e., two containers per serviced property, two collection rounds. As this option will mean that households require two additional bins this may be less convenient for some households due to access and storage issues. Although GHG reduction is high as material diverted from landfill is being maximised; the associated transport emissions are higher than the other options as it involves provision of two separate collection services. This option allows green waste collections to be provided to only those that need it. However, the food waste service provision (volume and bin type) is unlikely to suit most commercial users and is likely to result in a separate collection methodology for commercial users which will further increase costs.
Flexibility	This option has good flexibility. All customers have the ability to use the bins in a way that best suits their needs. Households will likely use both the food and green waste bins whereas multi-unit dwellings or commercial customers will likely only have the need of food based organics services).
Affordability	Indicative annual cost per household is in the range of \$140-\$210 per annum.
Diversion from landfill	Approximately 17,630 tonnes per annum from households, reflecting 50% capture and a further 7,760 tonnes from commercial sources
Greenhouse gas emissions	12,950-18,250 tonnes CO₂-e of GHG emissions savings anticipated reflecting reduced disposal of food and green waste to landfill and emissions from composting or anaerobic digestion (food only). Collection emissions range associated with: Electric: 5,420 – 9,290 kg/CO₂/annum, Hybrid: 40,760 – 70,170 kg/CO₂/annum and Diesel: 51,100 – 87,960 kg/CO₂/annum.

Table 3.9 provides an overview and comparison of the options evaluation. This reflects the discussion presented in the tables above (see also Appendix B Table 1). The comments and summary highlight that there is no option that addresses all of the considerations. This means that the selection of collection approach will involve balancing benefits and trade-offs. These are summarised in Table 3.10.

Table 3.9: Collections option evaluation summary

Criteria	A. Green waste only*	B. Food waste only	C. A combined green and food waste collection service	D. Separate collection of green waste and food waste
Technical risk				
Flexibility				
Markets				
Capital cost				
Affordability (Council, ratepayers, businesses)				
Diversion from landfill				
Environmental impacts				
Greenhouse gas emissions				

* Does not deliver on Central Government signalled statutory requirements.

Table 3.10: Option benefits and trade-offs

Collection option	Benefits	Trade-offs
Option A: Green waste only	Does not meet strategic requirements	
Option B: Food waste only	Lower cost	Diversion Flexibility
Option C: Combined food and green waste collection	Diversion Flexibility GHG emissions	Cost
Option D: Separate food and green waste collection	Diversion Flexibility	Cost GHG emissions

3.2.3 Organic material collection options preliminary view

The evaluation of the organic materials collection options presented in Section 3.2.2 illustrates that there is no perfect approach. If diversion or GHG emissions reduction is the key focus then options that involve collection of food and green materials are preferred.

Options that target food and green waste are also considered more flexible including the ability to respond to changing mandatory requirements in the future. Cost is related to the collection approach and the total quantity of material collected. This means that food only or garden only collections will be preferred if cost is the primary consideration.

This evaluation uses assumptions regarding capture, cost and emissions reduction that will be confirmed or require adjustment as detailed service configuration is developed and as services are procured.

The selected collection option should reflect the outcome of this assessment. The procurement process will focus on identifying a collection approach that delivers the service objectives. The objectives used in this analysis are maximising diversion, emissions reductions, flexibility, and cost. It is possible that these objectives will be adjusted through detailed service design and procurement planning.

The evaluation suggests a combined green and food waste collection service (Option C) best delivers a balance of benefits and trade-offs. While Option C is unlikely to be the cheapest, key benefits include:

- Maximised diversion of organic material from landfill through capturing food and green waste.
- Maximised GHG emissions reduction through avoided landfill disposal with some variation depending on the processing approach adopted.
- Flexibility to respond to users' needs and wider legislative changes.

However, if cost to households is of priority, then collection of food waste only (Option B) may be preferred. The evaluation suggests this would reduce flexibility, deliver lower diversion of material from landfill and higher emissions.

Likewise, if flexibility and diversion from landfill are of highest priority, then collection of green waste and food waste via separate collections (Option D) may be preferred. This is likely to involve higher cost and additional GHG emissions compared to Option C due to additional collection movements.

3.3 Organic material processing

3.3.1 Organic materials processing options

The most suitable approach for organic material management is largely dependent on the composition of the feedstock. Typically processing options fall into three categories: combustion, composting, and both forms of (wet and dry) anaerobic digestion, with the latter being better suited to high nitrogen, and high moisture material such as food waste (Figure 3.1).

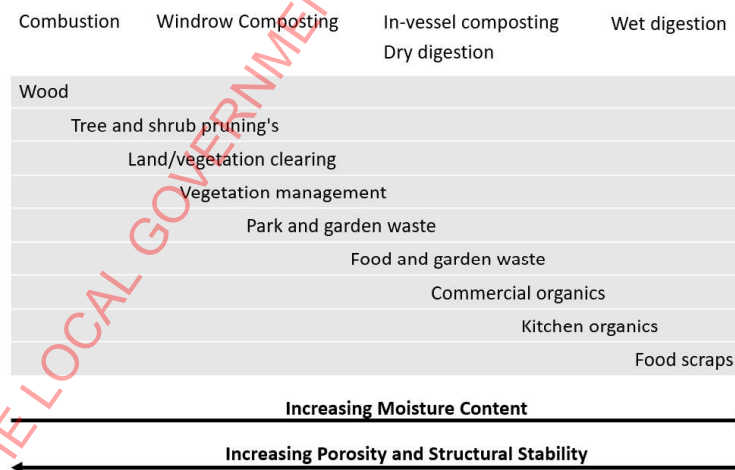


Figure 3.1: Treatment method based on physical and chemical properties¹².

¹² Figure modified by Tonkin & Taylor from existing figure in Understanding the processing options, Fact Sheet 5, DEECCW

In addition to the suitability of feedstock, other considerations for processing options include markets for outputs (such as compost or digestate) and users of biogas or heat power generated using biogas. It is also important to note that a processing site may draw on multiple sources to secure suitable combined feedstock. For example:

- Composting could be used to process a mixture of food only collections, green waste, primary processing waste streams¹³ and bulking material (wood chip, sawdust).
- A wet anaerobic digestion process may combine food only collection material with other putrescible materials to optimise feedstock for gas production.
- A dry anaerobic digestion may process a mixture of, for example, food only collections, food and green waste and primary processing waste streams¹³.
- Vermi-composting could be used to process a mixture of food only and higher carbon materials. Examples include pulp wastewater sludge and repulped paper/cardboard.

Process outputs may be used close to the processing site or transported some distance to end users. Where transport distances are large, minimising both volume and weight may help to improve the overall financial viability of the processing solution. Biogas is typically used locally to generate heat and/or power.

Larger scale processing typically means lower cost per unit of material processed when all other factors are the same. This needs to be balanced with the cost of transporting feedstock to a larger processing site. As for process outputs, wet materials are heavy with a consequential impact on transport costs.

More complex approaches, required for food waste and similar putrescible materials, will be more expensive to construct and operate. This means that it may be more cost effective to have a hybrid approach that includes a smaller complex processing solution for putrescible materials with green waste processed using a lower cost approach.

There are also a range of novel solutions emerging that don't fit into the four categories noted above. These are noted in the Organic Options Report and include:

- Soldier fly larvae – low level of technological maturity and currently limited to commercial source food waste. This process would require a separate, food only, collection and careful management of contamination.
- Hydrothermal liquefaction – low level of technological maturity and expensive.
- Biofuel – low level of technological maturity and expensive, typically woody materials only.
- Mechanical biological treatment (MBT) and mechanical heat treatment (MHT) – low level of technological maturity and expensive, typically applied to mixed residual waste.
- Gasification – low level of technological maturity and expensive, typically applied to mixed residual waste.
- Pyrolysis – low level of technological maturity and expensive, typically applied to mixed residual waste.
- Torrefaction – low level of technological maturity and expensive, typically applied to mixed residual waste or woody waste.

For completeness, a long list of all established and emerging technologies have been considered for their suitability for combined green and food waste type feedstock (Table 3.11). Appendix A includes further detail on each processing option.

¹³ For example water treatment sludges or unwanted by-product from food processing.

Table 3.11: Processing options and suitable feedstock

Processing options	Food waste	Green waste	Food and green	Other materials	Comment
1. Food rescue	✓	✗	✗	✗	Protecting food quality is important.
2. Stock feed	✓	✗	✗	✗	Protecting food quality is important.
3. Community composting	✓	✓	✓	✗	Limited scale and careful management of the food component required (to avoid odour).
4. Vermi-composting	✓	'Soft' green waste	'Soft' green waste	✓	Some 'soft' green waste can be processed, mix pre-processing important.
5. Aerated static pile composting	✓	✓	✓	May be suitable	Mix and pre-processing critical to enable consistent processing and quality product.
6. Windrow composting	Can process a small proportion of food waste	✓	Subject to location	✗	Mix and pre-processing critical to enable consistent processing and quality product.
7. In-vessel composting	✓	✓	✓	May be suitable	Mix and pre-processing are critical to enable consistent processing and quality product.
8. Wet anaerobic digestion	✓	May be suitable for 'soft' green waste	May be suitable for 'soft' green waste	May be suitable	Mix and pre-processing important, digestate may require dewatering or other processing.
9. Dry anaerobic digestion	✓	✓	✓	May be suitable	Mix and pre-processing important, digestate will require maturation.

Food rescue (1.), stock feed (2.) and community composting (3.) are all important measures for managing organic materials, but experience has shown that these approaches have limited scalability and applicability to all materials. This means that options that can operate at a city or regional scale will be required. This means that procurement of large scale processing solutions needs to ensure that the large scale approach doesn't 'crowd out' the smaller scale solutions such as food rescue, stock feed or community scale activity.

As shown in Table 3.12, all of the remaining six options can process food waste. However, aerated static pile composting (5), in-vessel composting (7) and dry anaerobic digestion (9) are the only three that are suitable for mixed food and green waste material (unless material is pre-processed and separated). Vermicomposting (4) and wet anaerobic digestion (8) may be able to process 'soft' green waste material, but this is dependent on the type and quantity of green waste and other variables specific to location and management of environmental effects. Windrow composting (6) is suitable for green waste and limited quantities of food waste¹⁴ subject to location and processing details.

Table 3.12 and Table 3.13 provide an overview of each of the processing options available including key information.

¹⁴ Due to risks associated with odour, pathogens and vector.

All of the processing options may require feedstock pretreatment. This may involve removal of physical contaminants such as plastic, glass or rocks. It is also likely to involve shredding and/or mixing to provide a consistent feedstock in a form suitable for the specific process.

Processing implementation costs will primarily include capital costs associated with the design, consenting, development and construction and commissioning of the processing facility. They may also include costs associated with land purchase if no suitable land is already owned by the processor.

For capital costs there is an obvious trade-off between land requirements and technical investment. For options that require simple technology or standard equipment, a larger land area is often required for both processing and buffer land. Conversely, for options that require a specialised technology or equipment, land requirements are often lower through more effective management odour risk and/or higher throughput. In effect there is a continuum with respect to capital cost with highly engineered systems enabling high throughput (therefore reducing space required) and more effectively managing odour risk (reducing buffer requirements).

The variables associated with the capital costs of a processing facility make it difficult to be specific on an exact cost at this options analysis stage. Consideration has been given to the costs of existing facilities (where that information is available) alongside national and international information. The capital costs adopted here have been developed by Mark Abbot Consulting¹⁵, included as Appendix F.

It should be noted that operational costs are different to gate fees. The gate fee charged by a facility will be made up of multiple components including:

- Amortised¹⁶ capital costs (cost of financing capital investment).
- Direct operating costs, for example:
 - Maintenance.
 - Staff, materials, utilities, and consumables.
 - Inputs, for example bulking materials, antifoaming agent, dewatering aids).
 - Lease costs.
- Organisational overheads (as allocated to the processing operation).
- Profit.

This business case considers the potential indicative costs for the purpose of processing technology comparison and analysis only, detailed costing will need to be confirmed through the procurement process.

¹⁵ Business Case Peer Review: Organics Processing Facility (Mark Abbot Consulting, 8 August 2023)

¹⁶ Gradually write off the initial cost of (an asset) over a period through regular payments

Table 3.12: Organic material processing options

Processing option	Description	Feedstock description	Feedstock quantity	Outputs	Potential Markets	Site requirements
4.	Vermicomposting	Food waste - Some 'softer' green waste may be accommodated. Feedstock will need to provide a suitable mix of materials i.e.; supplemental feedstock may be required.	Food waste: 17,690 tonnes (household and commercial)	Liquid – worm tea Solid – vermicast	Landscaping, Retail, Horticulture, Grassland/arable.	Large, flat land area with suitable buffer distance for odour.
5.	Aerated static pile composting including covered systems	Food and green waste. Bulking agent will be required for food only feedstock.	Food and green waste: 25,390 tonnes (household and commercial)	Compost	Landscaping, Retail, Horticulture, Grassland/arable.	Large, flat land area with suitable buffer distance for odour.
6.	Windrow composting	Green waste - may accommodate food waste depending on site location and specifications.	Green waste: 5,070 tonnes (domestic only)	Compost, mulch	Landscaping, Retail, Horticulture, Grassland/arable.	Large, flat land area with suitable buffer distance for odour.
7.	In-vessel composting	Food and green waste. Bulking agent will be required for food only feedstock.	Food and green waste: 25,390 tonnes (household and commercial)	Compost	Landscaping, Retail, Horticulture, Grassland/arable.	Land required for maturation process. However Smaller land parcel than exposed composting and reduced buffer distance required for odour as process is enclosed. ¹⁷
8.	Wet anaerobic digestion	Food waste - may accommodate 'softer' green waste but dependant on pre-processing.	Food waste: 17,690 tonnes (household and commercial)	Methane, carbon dioxide and liquid digestate	Biofuel (heat/power), Horticulture, Grassland/arable.	Smaller land parcel than exposed composting and reduced buffer distance required for odour as process is enclosed.

¹⁷ Reduce buffer distance is a key benefit as reflected by guidance from EPA in Victoria ([ATTGTO5C.pdf](#)) and New South Wales ([Organics processing facilities \(nsw.gov.au\)](#))

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Processing option	Description	Feedstock description	Feedstock quantity	Outputs	Potential Markets	Site requirements
9.	Dry anaerobic digestion	Food and green waste.	Food and green waste: 25,390 tonnes (household and commercial)	Methane, compost, carbon dioxide and liquid digestate	Biofuel (heat/power), Horticulture, Grassland/arable.	Smaller land parcel than exposed composting and reduced buffer distance required for odour as process is enclosed.

Table 3.13: Indicative cost and greenhouse gas emissions by organic material processing option

Processing option	Description	Indicative capital costs	Indicative gate fee (per tonne)	GHG emissions savings – tonne CO2-e ¹⁸
4.	Vermicomposting	No information available	\$53-100	12,950 – 18,250
5.	Aerated static pile composting	Adopted \$55M for 50,000 TPA facility	\$95+	(note: collection emissions for two collections not included)
6.	Windrow composting	Adopted 20M for 50,000 TPA facility	\$66-110	Up to 3,100 ¹⁹
7.	In-vessel composting	Adopted 70M for 50,000 TPA facility	\$100-180	12,950 – 18,250
8.	Wet anaerobic digestion	Adopted 35M for 50,000 TPA facility	\$120-270	(note: collection emissions for two collections not included)
9.	Dry anaerobic digestion	No information available		

Note: Adopted costs provided by Mark Abbott Consulting., GHG emissions savings are for processing vs landfill disposal only i.e. exclude transport emissions.

¹⁸ Net benefit calculated by avoided landfilled emissions minus the processing emissions

¹⁹ Assuming green waste only.

3.3.2 Organic material processing options evaluation

Evaluation of the proposed organic material collections against the relevant criteria is provided in Table 3.14

Table 3.14: to Table 3.19. Such analysis has been done on a generalised basis, based on common knowledge of the different processing options.

Table 3.14: Vermicomposting (Option 4) evaluation

Option 4	Vermicomposting
Overview	This option is not reliant on specific technology/equipment, making it relatively low risk from a technical perspective. However, it is dependent on an appropriate feedstock mix (to ensure effective processing) and a suitable location providing adequate buffer distances to manage odour risk during feedstock preparation. Although this processing approach can manage food waste, there is limited flexibility to respond to any green waste processing needs. This may mean that alternative processing may be required should diversion of green waste from landfill be a requirement in the future. There is established demand for the outputs produced and additional benefits in that the outputs can be sold as a standalone product or alternatively can be used as a feedstock for improving other compost materials. This allows for variability in markets and reduces the risk that may arise from single market reliance. Medium capital costs are required, with most of this attributed to the large area of land required. Processing itself is relatively straightforward and does not rely on use of complicated or specialist equipment. Processing costs tend to be higher than some other options due to the need for staff resourcing. Site works will need to include works for mitigating any environmental impacts, particularly from water. Odour issues can be a concern and sufficient buffer zones will be needed. This, along with the large area needed for processing, may limit site selection to more rural areas, thereby increasing transport and logistic costs and complexities. However, this would be balanced by the reduced potential impact on neighbours and more standard consenting conditions. Total emissions savings for this option are likely to be on the lower side due to the limitations on the suitability of feedstock and thereby reduced offset potential. Noting that this also does not account for transport emissions that may be higher due to the need for larger land areas. Emissions per tonne are around 0.46 tonnes CO₂-e per tonne of material processed.
Technical risk	Vermicomposting is an established approach in NZ for food waste, it is relatively low risk and is not reliant on specific technology/equipment making it relatively low risk.
Flexibility	Most suitable for food only or similar streams. Limited suitability for processing of green wastes. With sufficient space can accommodate quantity variations.
Markets	There is sufficient demand for quality vermi-cast and outputs can be used on their own or to boost other compost material. Pre-processing may be required to remove contaminants.
Capital cost	Simple process with pre-processing/ blending equipment required. Larger areas of land needed to accommodate the process and ensure a sufficient buffer zone to manage any potential environmental impacts such as odour or run-off.
Affordability	Medium processing cost.
Environmental impacts	Odour and water impacts can be controlled; however, risks remain with handling of odorous feedstock.

Greenhouse gas emissions	The low emissions from vermicomposting are offset by avoiding landfill disposal of some organic material. 7,885 tonnes CO ₂ -e of GHG emissions savings anticipated reflecting reduced disposal of food waste to landfill and emissions from vermicomposting processes. However, limitations on suitability of feedstock reduces the offset potential.
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Table 3.15: Aerated static pile composting (Option 5) evaluation

Option 5	Aerated static pile composting
Overview	This is a relatively low risk and established processing option, one that is already used in NZ. It can also accept food and green waste for processing, which means that diversion can be maximised and has flexibility to respond to any future diversion requirements. Total emissions savings are likely to be at the higher end of all of the options due to the offset from diversion of both food and green waste. Emissions per tonne are around 0.45 tonnes CO₂-e. Capital costs tend to be higher due to the need for aeration equipment, site preparation (including hardstand areas and runoff management) as well as the larger land area required to effectively process material and manage any environmental risks (i.e., buffer zones for odour management). Like vermicomposting, this may limit site selection to more rural areas, thereby increasing transport and logistic costs and complexities. However, this would be balanced by the reduced potential impact on neighbours and more standard consenting conditions. Although there is demand for compost, processing of material through aeration in this way can result in inconsistent quality of output material. This limits end market opportunities and may impact ability to meet accreditation requirements.
Technical risk	Established approach in NZ and internationally for food and green waste.
Flexibility	Suitable for food and green waste.
Markets	There is sufficient demand for quality compost however the potential for inconsistency of quality may impact accreditation requirements, which limits viability of some markets (i.e., horticulture). Pre-processing may be required to remove contaminants.
Capital cost	High capital cost with pre-processing and aeration arrangements required. The land area required is larger than for comparable in-vessel systems – for both composting area and buffer area to manage odour risk. This is offset by lower capital cost for process equipment (aeration, cover system).
Affordability	Medium to high processing cost to account for staff resourcing and maintenance of equipment. Bulking agent where feedstock requires it.
Environmental impacts	Odour and water impacts can be effectively controlled; however, risks remain with handling of odorous feedstock and compliance with resource consent /impact on surrounding properties.
Greenhouse gas emissions	Low emissions from composting are offset by avoiding landfill disposal of organic material. 11,727 tonnes CO ₂ -e of GHG emissions savings anticipated reflecting reduced disposal of food and green waste to landfill and emissions from composting processes.

Table 3.16: Windrow composting (Option 6) evaluation

Option 6	Windrow composting
Overview	There are similarities between windrow composting and aerated static pile composting in regard to land requirements, potential environmental impacts that need to be effectively managed, and lower quality of output material that will limit viable market opportunities. However, windrow composting has a lower capital cost than aerated or in-vessel composting systems as no specialist equipment or site infrastructure is required. Windrow composting is not well suited to food waste, which limits its flexibility and means that it is the poorest performer in reducing greenhouse gases. This also means that the compost has lower nutrient content than other composting processes that can handle higher nutrient feedstocks.
Technical risk	Established approach in NZ for green waste (and small quantities of food waste).
Flexibility	Mainly suitable for green waste with space and planning can accommodate quantity variations.
Markets	There is sufficient demand for quality compost however this method typically produces lower nutrient soil improver products rather than high nutrient compost. This also means that the compost has lower nutrient content than other composting processes that can handle higher nutrient feedstocks. Pre-processing may be required to remove contaminants.
Capital cost	Medium capital cost – less infrastructure requirements, however larger areas of land needed to accommodate pre-processing and the composting process. A sufficient buffer zone to manage any potential environmental impacts will also be required.
Affordability	Relatively low processing costs although bulking agent where feedstock requires it, which may impact costs.
Environmental impacts	Need to manage environmental risks such as high nutrient run off in heavy rain and risk of odour complaints.
Greenhouse gas emissions	The low emissions from composting are offset by avoiding landfill disposal of green organic material. 3,059 tonnes CO ₂ -e of GHG emissions savings anticipated reflecting reduced disposal of green waste to landfill and emissions from composting processes. However, limitations on the suitability of feedstock reduce the offset potential.

Table 3.17: In-vessel composting (Option 7) evaluation

Option 7	In-vessel composting
Overview	This is a low risk, established processing option for both food and green waste. Output materials from in-vessel composting are often superior to other composting processes, including better moisture content and retention, better structure, and better nutrient content. A variety of end market opportunities exist, which reduces the risk of dependency on any one single market. Total emissions savings are likely to be at the higher end of all of the options due to the offset from diversion of both food and green waste. Emissions per tonne are around 0.45 tonnes CO₂-e. The need for specialist equipment and site set up, including land for maturation processes, means that there is a higher capital investment required. Similarly, processing costs are higher than other composting options due to the need for power, water and staffing. A bulking agent will also be needed, which will impact processing costs. These costs may be balanced by the high diversion potential and greater reliability of end use markets.
Technical risk	Established approach in NZ and internationally for food and green waste.

Option 7	In-vessel composting
Flexibility	Suitable for food and green waste, as well as other types of putrescible wastes.
Markets	High quality output. Fully pasteurised materials that are outputted after in-vessel treatment are physical contaminant (plastics, glass, stones) and pathogen free, this makes more markets viable as the product is more attractive to a range of end users. Pre-processing may be required to remove contaminants.
Capital cost	High capital cost due to investment in pre-processing and process vessel equipment. Some land is also required to allow for maturation processes.
Affordability	Medium to high processing cost due to the power, water, bulking agent where feedstock requires it and staffing requirements.
Environmental impacts	Odour and water impacts can be effectively controlled.
Greenhouse gas emissions	The low emissions from composting are offset by avoiding landfill disposal of organic material. 11,727 tonnes CO ₂ -e of GHG emissions savings anticipated reflecting reduced disposal of food and green waste to landfill and emissions from composting processes.

Table 3.18: Wet anaerobic digestion (Option 8) evaluation

Option 8	Wet anaerobic digestion
Overview	Although this processing option is established for some types of organic materials and is well used overseas, it is a relatively new technology for processing of food waste in NZ. While a variety of organic materials can be processed by wet AD, there is limitations with processing of green waste material. (However, this can be addressed through pre-sorting, with the woodier green waste processed through existing technologies, such as windrow composting.) Introduction of this processing technology may open up additional, commercial or industrial feedstock markets, within the wider Wellington region. Emissions savings per tonne are high however the suitability of food waste (unless pre-sorting in place) only limits total offset potential. Noting that the potential for additional feedstock sources has not been accounted for at this stage. Capital investment is high, this is mostly attributed to specialist equipment as land requirements are not as extensive as the composting options. Processing costs are also medium to high, however, there is potential to recover some of these costs through the sale of biogas or as electricity sold to the grid. Markets are available for electricity and/or biogas, however, revenue on sale and use of digestate will require further investigation. It is possible to apply liquid digestate as fertiliser. There is also potential for additional cost if the digestate needs dewatering to meet end market preferences.
Technical risk	Wet digestion of biological sludges is well established in NZ. Food waste digestion is well established internationally but relatively new in NZ.
Flexibility	A variety of organic material can be processed; however, wet AD is most suited to food or animal based organic material. Additionally, a relatively consistent supply of similar materials is preferred since rapid changes can disrupt the process. It is possible to remove bags / bin liners prior to digestion if required.
Markets	There are viable markets (heat, power) for biogas. Markets will need to be identified for digestate. Pre-processing may be required to remove contaminants.
Capital cost	Medium capital costs. Although specialist processing equipment costs are high, land requirements are not as extensive as other processing technologies, which allows for some savings. Potentially additional costs if digestate requires dewatering.
Affordability	High processing cost, all or partially offset through sale or use of biogas for electricity production.

Environmental impacts	Potential impacts can be effectively controlled.
Greenhouse gas emissions	The low emissions from anaerobic digestion are offset by energy (biogas) and avoiding landfill disposal of some organic material. 11,191 tonnes CO ₂ -e of GHG emissions savings anticipated reflecting reduced disposal of food waste to landfill and emissions from anaerobic processes. However, limitations on the suitability of feedstock reduce the offset potential. There may be additional emissions reductions where the biogas offsets non renewable energy sources e.g., coal or gas heat or transport fuel.

Table 3.19: Dry anaerobic digestion (Option 9) evaluation

Option 9	Dry anaerobic digestion
Overview	This option has the highest total greenhouse gas emissions offset potential of all of the options. This is due to its ability to accept both green and food waste, the low emissions from anaerobic processing and the offset from use of energy outputs. Dry digestion has not been implemented in New Zealand to date and therefore will be new to New Zealand regulatory authorities and operators. Similar to IVC and Wet Digestion, the technology has high capital and processing costs. Markets are available for biogas, however, on sale and use of digestate will require further investigation. Dry AD produces a digestate also, depending on configuration this may include a liquid stream (often recirculated) and a stabilised product that could be used with or without further processing such as dewatering or composting.
Technical risk	Dry digestion is well established overseas and has been in operation for some time (Europe and America) but is not yet established in Australasia or New Zealand. This means a facility in New Zealand will be new to New Zealand regulatory authorities and operators. This may impact consenting processes and therefore timeframes or consent conditions.
Flexibility	Dry digestion is suitable for food waste, food and garden waste combined and can also process agricultural waste such as grasses, straw, and silage, as well as livestock manure.
Markets	There are viable markets (heat, power) for biogas. Markets will need to be identified for digestate with or without processing. Pre-processing may be required to remove contaminants.
Capital cost	Medium capital costs. Although specialist processing equipment costs are high, land requirements are not as extensive as other processing technologies, which allows for some savings. As this is an emerging technology there is limited information available specific to dry anaerobic digestion.
Affordability	Medium-High processing cost although potential to offset some costs through sale or use of biogas. Bulking agent where feedstock requires it.
Environmental impacts	Potential impacts can be effectively controlled.
Greenhouse gas emissions	The low emissions from anaerobic digestion are offset by energy (biogas) and avoiding landfill disposal of organic material. 16,800 tonnes of CO ₂ -e of GHG emissions savings anticipated reflecting reduced disposal of organic waste to landfill and emissions from anaerobic processes.

Note that although potential markets have been identified in the above tables for the outputs from each processing option, further work is required to determine their availability for a facility in Wellington or nearby. The ability to identify and secure viable markets will need to be a key component of the due diligence component of any procurement process.

Table 3.20 provides an overview and comparison of the options evaluation (see also Appendix B Table 2). This reflects the discussion presented in Table 3.14 through Table 3.19. The comments and summary highlight that there is no option that addresses all of the considerations. This means that

the selection of the processing approach will involve balancing benefits and trade-offs. These are summarised in Table 3.21.

Table 3.20: Processing options evaluation summary

Criteria	4. Vermicomposting	5. Aerated static pile composting*	6. Windrow composting	7. In-vessel composting*	8. Wet anaerobic digestion	9. Dry anaerobic digestion*
Technical risk						
Flexibility						
Markets						
Capital cost						
Affordability (Council, ratepayers, businesses)						
Diversion from landfill						
Environmental impacts						
Greenhouse gas emissions						

Note: * proven to be able to accept and process mixed food and green waste material.

Table 3.21: Option benefits and trade-offs

Collection option	Suitable Feedstock	Benefits	Trade-offs
Option 4: Vermi-composting	Food only and 'soft' green	Low technical risk Flexibility Markets	GHG Emissions
Option 5: Aerated static pile composting	Green waste, food and green waste	Technical risk Flexibility	Environmental Impact Cost
Option 6: Windrow composting	Green waste	Technical Risk	Flexibility Environmental impacts GHG Emissions
Option 7: In-vessel composting	Green waste, food and green waste	GHG emissions Environmental impacts Technical risk Flexibility Markets	Cost
Option 8: Wet anaerobic digestion	Food waste, 'soft' green waste	Environmental impacts GHG Emissions Markets	Flexibility
Option 9: Dry anaerobic digestion	Green waste, food and green waste	Environmental impacts GHG Emissions Markets	Cost New technology for New Zealand

3.3.3 Organic materials processing preliminary view

The evaluation of the organic materials processing options presented in Section 3.3.2 illustrates that there is no perfect approach. The processing approach will be determined in part by the available feedstock. Access to suitable processing locations and markets for outputs will also be important.

If GHG emissions reduction is the key focus, then options that involve anaerobic digestion are likely to be preferred. This reflects the energy benefits of the use of biogas offsetting alternative energy sources as well as avoiding landfill disposal of organic materials.

Options that can take a range of material are considered more flexible including the ability to respond to changing mandatory requirements in future. Flexibility may also be delivered by combining processing approaches, for example anaerobic digestion of food materials with windrow composting of green waste.

If affordability is of priority, then aerated static pile composting (Option 5) is attractive although this option won't deliver on environmental impacts or GHG emissions reduction as well as the other options considered.

If environmental impacts and GHG emissions reduction are the key priorities then dry anaerobic digestion (Option 9) may be preferred, however, this will come with increased technical risk and anticipated high costs.

On the basis that a combined food and green waste collection is preferred, a combination of processing option may be the most suitable solution. This could involve, for example, IVC or dry AD only in conjunction with pre-processing. Alternatively, it could involve conventional composting for the green waste, and wet AD and/or dry AD for the remaining material. This means that any procurement process should note the outcome of this assessment but focus on identifying a processing approach that delivers the desired balance between flexibility, minimising technical risk, emissions reductions and cost.

In case of a food-only collection being preferred, vermi-composting, APS, ICV and anaerobic digestion are all potential approaches. As noted above, any procurement process should focus on identifying a processing approach that delivers the desired balance between flexibility, minimising technical risk, emissions reductions and cost.

Windrow composting is suitable for green waste only feedstock and could be used alongside an approach suitable for a food only feedstock. This dual processing strategy would lose some economies of scale but avoid high processing costs for green waste compared to windrow composting.

3.3.4 Site considerations

Some of the processes considered will have more specific site constraints than others; for example, composting processes that do not utilise an enclosed system (allowing rapid initial composting) are likely to require larger land lots to effectively accommodate piles or rows. Suitability of the site to mitigate any potential environmental impacts is also a key consideration, as is distance from source and markets.

The need for a sufficiently sized, suitable site may be challenging. Other options such as a network of smaller sites to reduce the burden on a single site and to create regional resilience could be provided for in the procurement process.

3.3.4.1 Consent requirements

Each processing technology needs to be considered within the context of the relevant rules and requirements of the applicable regional and district plans. Given the three councils' requirement for

any processing site to be in a location that is suitably accessible by all, it is likely that any processing site will be within, or close to, the Wellington region. If located within the region, it would be subject to rules and requirements of the Wellington Region Resource Management Plans²⁰.

Consenting implications are highly dependent on the location of the site as well as the design of the processing technology and a comprehensive analysis of consenting requirements will need to be undertaken upon final site selection. Based on references to, and definition of composting in the relevant Wellington Region Resource Management Plans, a consent for any of the processing technologies can be expected to be, at a minimum, a discretionary activity.

It is also possible that processing could take place north of the Wellington region within an existing composting operation located in Foxton, or in a new wet anaerobic digestion facility proposed in Fielding. These operations are both located in the Manawatu – Whanganui region.

Any organic material processing operation will require consents under the relevant plans. Key focus areas will include air quality (odour), water management, and managing vermin (rats, birds). There are also likely to be product quality requirements, through consent requirements and/or set by key end markets.

3.3.4.2 Potential locations

It is beyond the scope of this business case to confirm one or more specific sites for organic materials processing. It is useful however to note considerations and some potential processing locations to illustrate how confirming processing location may be undertaken.

Key location considerations should include:

- Transport distance for collected materials – either direct drop-off by collection vehicles or with intermediate bulking of materials for transport to a remote processing site.
- Transport distance for process outputs i.e., distance to market.
- Surrounding land use including buffer areas controlled by the process operator.
- District Plan zoning and land ownership.

As noted above, there are existing organic materials processing operations north of Wellington that may be suitable for materials collected from the Wellington region. It may also be possible to locate organic materials processing within the Wellington region, for example at an existing waste and resource recovery operation or on other suitable land.

Potential processing locations identified to illustrate possibilities for materials from the Wellington Region are:

- Fielding Resource Recovery Park and Wastewater Treatment Plant - proposed organic materials processing facility.
- Parau Organics (Foxton) – existing organic materials processing facility (windrow composting).
- Composting NZ (Otaihanga) – existing windrow composting facility.
- Composting NZ (Masterton) – existing windrow composting facility.
- McMud Earthmovers (Grenada) – existing windrow composting facility.

²⁰ The regional management plans for the Wellington Region are the responsibility of Wellington Regional Council and include: the Regional Air Quality Management Plan (RAQM), the Regional Coastal Plan, the Regional Freshwater Plan, the Regional Soil Plan, and the Regional Discharges to Land Plan.

- Capital Compost (Southern Landfill) – existing windrow composting facility.
- Judgeford area – rural area close to Hutt, Porirua and Wellington City, potentially suitable for anaerobic digestion, composting or vermi-composting facility.
- Wairarapa area – rural area, close to viticulture (Martinborough) and agricultural markets.

As noted above, smaller and more local processing may also form part of the solution.

Table 3.22: Potential locations

Potential location	Address	Description	Distance from material source	Potential local markets	Surrounding land use	Zoning
Fielding Resource Recovery Park and Wastewater Treatment Plant	247 Kawakawa Road, Fielding	Mixture of hardstand areas and green. Several settling ponds as well as a treatment plant. Bordered by the Oroua River.	Hutt Central – approx. 146 km Porirua City Centre – approx. 140 km Wellington CBD - approx. 155 km	Horticulture and primary production	Rural – borders the Oroua River. 5km to State Highway 3.	Manawatu District Council District Plan 2020: Rural 1 – designation 35 and 35A – Sewage Treatment Purposes
Paranui Organics	Paranui Road, Foxton	Rural, farmland. Some hardstand but mostly green or compacted earth. Some earth piles along road boundary.	Hutt Central – approx. 112 km Porirua City Centre – approx. 106 km Wellington CBD - approx. 121 km	Horticulture and primary production	Rural farming and horticulture land. 1 km to State Highway 1.	Horowhenua District Council District Plan 2015: Rural zone
Composting NZ (Otaihangā)	160 Otaihangā Road, Otaihangā, Paraparaumu	Commercial-industrial site, some road stand areas and roading. Earth piles throughout site, some as buffer zones.	Hutt Central – approx. 46 km Porirua City Centre – approx. 40 km Wellington CBD - approx. 60 km	Suburban horticulture	Semi-rural, residential lifestyle block developments to the North and residential to the south. Borders Kāpiti Expressway	Kāpiti Coast District Council District Plan 2021: General rural zone, PREC48- Rural dunes precinct
Composting NZ (Masterton)	49 Waingawa Road, Carterton, Masterton	Industrial site, primarily hardstand surfaces, some planting along boundaries.	Hutt Central – approx. 80 km Porirua City Centre – approx. 90 km Wellington CBD - approx. 95 km	Horticulture and primary production	Industrial and commercial with rural surrounds. Borders State Highway 2	Wairarapa Combined District Plan: Industrial zone

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Potential location	Address	Description	Distance from material source	Potential local markets	Surrounding land use	Zoning
McMud Earthmovers (Grenada)	36 Aruba Grove, Grenada Village, Wellington	Commercial, mixture of hardstanding and compacted earth areas. Multiple covered areas. Some planting along some boundaries.	Hutt Central – approx. 17 km Porirua City Centre – approx. 10 km Wellington CBD - approx. 12 km	Suburban horticulture	Commercial in immediate surrounds, residential to the south, green space and bush to the north. Borders State Highway 1.	Wellington City Council District Plan 2021: Urban development zone
Judgeford area	No specific site identified	Rural, mixture of small valleys and smaller flatter areas.	Hutt Central – approx. 15 km Porirua City Centre – approx. 13 km Wellington CBD - approx. 30 km	Horticulture market	Rural	Porirua City Council District Plan 1999: Generally rural zone
Wairarapa area	No specific site identified	Rural, mixture of undulating valleys and flatter/plains areas.	Hutt Central – approx. 66 km Porirua City Centre – approx. 78 km Wellington CBD - approx. 80 km	Horticulture market	Rural and primary production	Wairarapa Combined District Plan: Generally special rural or primary production zoning

Note: distance to Judgeford and Wairarapa areas measured to Judgeford township and Martinborough for reference only. Distance may be more or less depending on exact location of any suitable site.

4 Financial Case

4.1 Collection cost components

Collection costs will include costs specific to implementation such as bin purchase and rollout as well as ongoing operational costs such as collection, processing, education and enforcement. These different components and different approaches to packaging them are illustrated in Figure 4.1.

The illustration on the left hand side notes the various parts of the 'puzzle' that need to be in place to have an effective organic materials collection system in place. Critically, the more tangible components such as bins or processing need to be supplemented by ongoing education and enforcement.

The chart on the right hand side illustrates the different components of the cost for an organic materials collection service. This is particularly important to understand in the context of potential grant funding for capital costs for bins and organic materials processing.

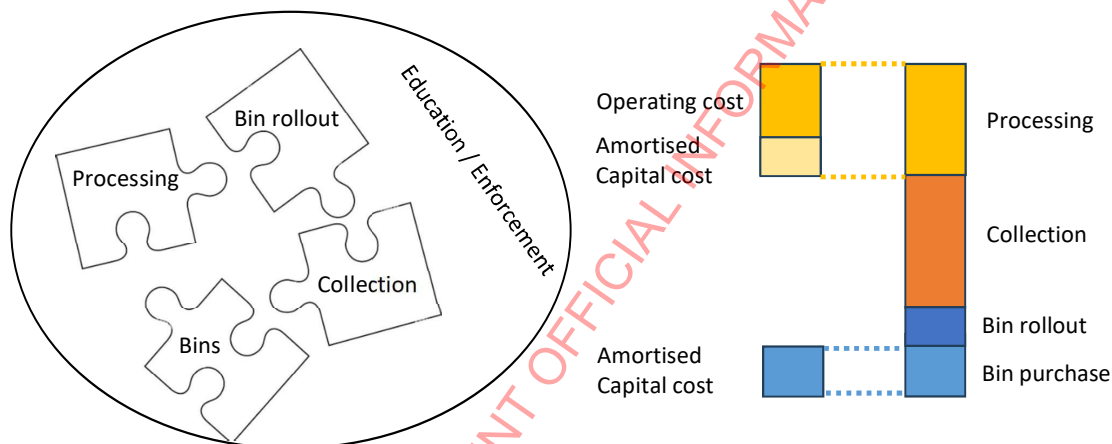


Figure 4.1 Collection cost contributing components.

Table 4.1 illustrates various scenarios for how each collection cost component can be funded. For example, bin purchase and roll out costs may be a separate cost or incorporated into a collection or collection and processing contract. In all scenarios these costs can either be amortised over the life of the contract or treated as a separate, capital component. Similar options apply for materials processing.

Table 4.1: Collection contract component packaging approaches

Collection cost component	Council	Bin purchase contract	Collection contract	Collection and processing contract	Processing contract
Bins		✓	~	~	
Bin roll-out	✓	✓	~	~	
Collection			✓	✓	
Education/enforcement	✓		~	~	
Processing				✓	✓

The service costs that are publicly available in NZ, typically targeted rates, incorporate all of the component costs. How the components have been procured vary ranging from discrete packages, contracted capital and operational costs and fully operationalised costs.

How the different components are procured will have an impact on the funding requirements.

- The councils could directly invest in infrastructure, such as collection bins or an organic materials processing facility. This could draw on:
 - WMF grant funding²¹.
 - Direct funding from rates i.e., spend rates funds as they are collected.
 - Loan funding i.e., fund investment through loan with loan repaid through service charges and/or rates.
- The councils could procure the 'function' delivered by infrastructure through operational contracts.
 - A collection contract could include supply and roll out of collection bins, with the capital cost typically funded over the contract term²².
 - The gate rate in a processing contract could provide for amortised capital costs²³.

Council investment could be for all or part of the total required capital investment with the remainder recovered through a reduced gate rate or service cost. This is a hybrid of the two approaches noted above.

4.2 Material processing cost components

As illustrated in Figure 4.1, processing costs are also made of several components. These include:

- Capital investment, reflecting land (if owned/purchased), design, consenting, construction and equipment.
- Operating costs, potentially including financing for capital investment.
- Overheads.
- Margin (for commercial investments).

²¹ Councils have been invited to apply for grant funding for collection containers (including associated roll out) and organic materials processing infrastructure.

²² This has been a common approach for recycling contracts in New Zealand, but it is not clear whether collection contractors will have the ability to access WMF grant funding for new containers in the same way that Councils can.

²³ This is a common approach for recyclables processing and for organic materials processing where a facility is accepting materials from multiple Council and other sources.

From a council perspective, processing costs may be:

- An operational cost, where others have undertaken the capital investment and are recovering the cost of that investment and operational costs through processing charges (or gate fees).
- An operational cost, reflecting council's costs incurred in operating a processing facility and any financing costs for capital investment; and/or
- A capital cost, where council has developed the process facility.

Where the councils are the facility developer, loan funding will be reflected in operational costs. Where the councils are paying a gate rate, the processing charge or gate rate will reflect the financing costs of the facility developer.

4.3 Sources of funding

There are multiple potential sources of funding. These are summarised below and discussed further in the remainder of this section.

Table 4.2: Potential funding sources

Cost component	New bins	Organic materials collection	Organic materials processing	Processing capital investment
MfE Kerbside implementation Funding	✓	✓		
Rates	✓	✓	✓	✓
Council waste disposal levy funds	✓	✓	✓	✓
MfE WMF			✓	✓
Private sector funding ²⁴	✓			✓

4.3.1 Ministry for the Environment – kerbside organics implementation funding

\$120 million of contestable funding is available until June 2024 from MfE Te Pūtea Whakamauru Para the WMF and Climate Emergency Response Fund to help councils and the private sector invest in diverting food and other organic wastes from landfill.

MfE's kerbside organics implementation funding package is for councils that are ready to rollout kerbside organics services. The intent is that this funding will contribute to service cost savings by reducing the proportion of bin infrastructure capital investment that would otherwise need to be covered by councils and their service users. Bin supply and roll out costs are expected to contribute in the order of \$5 - \$10 to annual service costs per household²⁵.

The preliminary preferred collection option (Option C) involves collection of mixed green waste and food waste using an 80 L wheelie bin. There is potential to provide allowing for larger bins (with an associated increased targeted rate) for households wanting to dispose of larger quantities of green waste through the combined collection. Based on the information publicly released by MfE, approximately \$3.8 M of funding for bin infrastructure could be available to the three councils for this option. Further detail on the breakdown of this funding, or what would be available for collection Options B and D in line with the information publicly released by MfE, is presented in Appendix D. Given the solution to be adopted by each council is subject to council planning and

²⁴ Recovered through collection or processing contract costs.

²⁵ Based on \$25 - \$50 bin, \$7 roll out costs, 5% financing costs and a 7 year contract term.

procurement processes, the councils should consider applying for the maximum funding available (larger bins) to avoid creating a funding shortfall in the future.

The three councils may also want to consider whether there is merit or opportunity to collaborate with other councils in the region to maximise funding and economies of scale, particularly in relation to the communication and marketing component of the available funding. This could also include additional councils as part of the application process, or alternatively noting an intention with the application to work collaboratively with additional councils on marketing and communications material.

The kerbside funding package also includes provision for pre-implementation activity focussed on organic materials processing and business cases for collection services. This package supports:

- Planning, collection and processing options assessment.
- Development of a business case.
- If the three councils continue to work together or collaborate with additional councils in the region or lower north island, this funding presents an opportunity for additional research, data collection, and planning opportunities for a relatively low investment. Although the three councils have undertaken the majority of the pre-implementation work for standard organics collections, there may be other areas where access to this funding would be useful, such as designing effective organics collection services for multi-unit developments.

4.3.2 General or targeted rates

All three Councils have a general principle that the cost of service should, where possible, be funded by the users of the service. This can be achieved through:

- General rate funding – with service funded by all rated properties, regardless of whether they receive a service.
- Targeted rates funding – with serviced properties covering the cost of the service through standardised charges.
- Direct user pays charges – service users paying directly for the service used.

Table 4.3: Rates vs direct user funding

Funding	Advantages	Disadvantages
General rate	Very simple to administer. Meets signalled government requirements. Ensures access to organic materials diversion for all households.	Imposes cost on ratepayers (and/or businesses) who don't have access to the service (commercial, rural).
Targeted rate	Relatively simple to administer. Meets signalled government requirements. Ensures access to organic materials diversion for all households. Link with rubbish and recycling funding. Potential to provide for variable bin size/charging arrangements.	Cost to household even if they don't use the service (in line with existing targeted rates for recycling services, where already in place).

Funding	Advantages	Disadvantages
User charges	Benefits those who minimise their use of the service	Complex to administer. Organic materials diversion opportunities only available to households who take up the service. Likely to suffer from insufficient buy-in (households opting out to save costs), and lack of economies of scale. Unlikely to meet requirements signalled by government.

4.3.3 Waste Disposal Levy

Funding via the council allocated portion of the Waste Disposal Levy may also be a source of funding. It is anticipated that as levy funds collected each year increase, the quantity of levy funding received by individual councils will also increase. Availability of this funding to subsidise or contribute to the collection costs may vary between each of the three councils depending on Regional WMMP actions and existing allocation of their levy funding.

Subject to setting out the intent to do so in the Regional WMMP, levy funds could be allocated to:

- Direct infrastructure investment (new collection bins, processing infrastructure).
- Collection costs i.e., offsetting contracted costs.
- Supporting information, education or enforcement activity.
- Processing costs i.e., offsetting operational or contract costs.

4.3.4 Ministry for the Environment – Waste Minimisation Fund

Funding is available for organic waste processing facilities and resource recovery infrastructure, and normal WMF criteria will apply. MfE states that applications from multiple councils looking at shared services are encouraged and will be assessed favourably, the level of co-investment required will be considered on a case-by-case basis. The private sector can also apply for funding, potentially in partnership with councils.

Funding through the WMF may require that councils retain ownership of the facility (site and equipment) to meet the terms of the funding deed. A model where council/s develops a site and processing equipment with the operator leasing the facility is likely to be workable within the funding arrangements. A scenario with councils procuring processing from a facility owned by another party is unlikely to be consistent with council securing WMF support. If such a scenario was to be considered, an early discussion with the WMF team at the MfE on implications and possibilities would be required.

For MfE to commit to funding it is likely to need certainty on the processing technology, the facility location and the proposed governance approach. On balance, it is recommended that, utilising the information in this business case and the supporting Organic Options Report, the three councils collectively undertake an expression of interest procurement process to further identify and refine the processing approach. This process will not only enable certainty on the approach but may also identify potential private sector partners and associated site locations. An early discussion with the WMF team at the MfE on implications and possibilities of this approach would be advisable.

4.3.5 Private funding

This may be as a sole investor or alongside public funding. As for other funding approaches noted here, funding costs are amortised and recovered through service charges. This option will be attractive where:

- Councils are restricted in access to capital funding.
- There is potential to establish a processing facility to service multiple councils and commercial organic materials generators.
- The private sector party have specific skills, access to organic materials or markets that council's alone do not have.

5 Commercial case

5.1 Organic material collections procurement

Although HCC provide an optional 4-weekly green waste collection, none of the three councils currently provide a food waste service of any kind. Therefore, implementation will include procurement of a new service contract or a variation to existing contracts where that is possible. Councils need to consider the legislated four wellbeings and how outcomes will deliver local benefits; it is therefore expected that contractors will be expected to demonstrate they can deliver on council's broader outcomes in any tender or proposal.

In procuring organic material collections the three councils could individually procure for these services or alternatively collaborate to procure for a shared collection service. A collaborative approach supports a collective local government approach, consistency in contracts, consistency in the goods and services purchased, and better use of taxpayer money by leveraging economies of scale and creating opportunity for savings (typically 5-10% price savings)²⁶. The single procurement approach reduces private sector tendering workload and provides an opportunity to create efficient contract service areas. It also reduced pressure on the region's workforce.

However, the benefits of entering into a shared collection service contract need to be considered against the potential risks which include:

- Political/community resistance.
- Customer perception.
- Unclear roles and responsibilities in contract administration and management.
- Potential exposure to partner councils contractual issues.
- Impact on smaller, local contractors.
- Complexity of tender evaluation.

A number of these risks can be mitigated through establishing a formal partnership between local government organisations. This could take place under the oversight of a Joint Committee established under the relevant provisions of the Local Government Act, which would involve an agreement between the participating organisations and may involve delegation of some decisions from the individual local authorities. A Joint Committee provides governance or oversight but cannot own assets. There is also potential for a Council Controlled Organisation (CCO) or a Council Controlled Trading Organisation (CCTO) to be jointly owned by two or more local authorities. Further consideration of these governance options is discussed in Section 6.

5.2 Organic material processing procurement

Regardless of the organic materials processing approach selected, a suitably qualified contractor or contractors will be required for the development and operation of an organic materials processing facility. The following activities may need to be delivered by contractors:

- 1 Consenting.
- 2 Detailed Design.
- 3 Construction:
 - Civil works and buildings
 - Specialist equipment and plant
- 4 Operations.

²⁶ Ministry for the Environment. 2007. Guidance Principles: Best Practice for Recycling and Waste Management Contracts.

These activities could be delivered separately or packaged in various ways. Councils need to consider the legislated four wellbeings and how outcomes will deliver local benefits and it is therefore expected that contractors will be expected to demonstrate they can deliver on council's broader outcomes in any tender or proposal.

Each council procuring an individual facility is unlikely to make economic, financial or strategic sense and a more collaborative approach is recommended. The focus of this initial analysis of options for procuring organic materials processing is focused on a single facility and the potential procurement approach that could be applied, it does not consider the split of ownership or responsibility between the three councils. Further discussion on governance is included in the Management case in Section 6 of this business case.

It is important to note that the organic materials processing implicitly assumes that products will have a viable and sustainable market. This means that the operations contractor is likely to need a clear market development and market engagement strategy, ideally focussed on a range of target markets and increasing the value of the various products.

5.3 Procurement approach

There are a number of considerations for the procurement process, and these will need to be explored in detail in a full Procurement Plan. These include:

- The services to be procured – collections, processing and/or design and construction of a processing facility.
- Potential suppliers.
- Contract structures – conventional services contract, collaborative models, design-construct, public private partnership models.
- Models for collaboration between the councils.
- Procurement risks - a preliminary analysis of procurement risks and opportunities is provided at the end of this section in Table 5.1.

The councils could negotiate with existing contractors to extend their scope to include provision of organic materials collections. Alternatively, the councils could run an open or invited procurement process to appoint one or more suitably experienced contractors to operate the service.

Should a collections contract be procured through a shared services model, the procurement tender processes could include:

- **Joint tender/contingent pricing** – which would involve separate contracts developed for each council who separately administered their relevant contract.
- **Single framework contract** – a contract is entered into by one of the councils on behalf of the others, with the others being nominated parties to receive services under the contract.
- **Joint principals contract** – a contract is awarded by the councils as joint principals. The resulting contract is managed by a management board.
- **Joint venture legal entity** – a legal entity is formed with shareholding by the councils.

For the facility construction the focus will be on securing best value for money through clear quality measures, alongside pricing a defined scope of work. This business case has noted that a range of processing solutions could be appropriate with a range of strengths and weaknesses. This means that the procurement process should enable procurement of any processing solution that can deliver outcomes at a reasonable cost (presents the best value for money).

Similarly, while potential locations have been considered in this business case, alternative or more suitable locations may be presented during the procurement process. Allowing for alternative solutions as part of the tender process would support such solutions to be identified.

For the processing facility, equipment and overall process design will be specialised. This means design is likely to be most effectively delivered in close consultation with one or more specialist equipment suppliers. Construction of the processing equipment will likely require appropriate enabling works (as part of civil works) with equipment potentially installed and commissioned by the selected equipment supplier.

Final selection of the process could involve the operator of the site, implying that they could have some involvement in the design and construction of the facility. This could take the form of a Design – Build – Operate arrangement or appointing the operations contractor prior to confirming the processing approach.

The Councils will stipulate what the requirements and outcomes for organic materials processing are. The competitive procurement process will be designed to achieve these requirements and outcomes, noting that the overall complete solution will require a combination of land, resource consents, processing technology, operator and secured end-markets.

5.4 Procurement timeline

The Wellington region does not currently have access to an organics processing facility (to cater for the scale of food waste volumes discussed in this business case) within 150 kilometres and therefore signalled central government requirements for food scraps collections do not apply until 2030. This allows timeframe of up to seven years to implement collections.

A procurement process timeline of around six to nine months is generally needed for a standard collection procurement process. Additionally, a general lead in time of at least nine months is required to enable collection plant, resources, and equipment mobilisation. Noting that where specialist equipment is needed, this is likely to take longer.

Establishing processing could take significantly longer with any new facility requiring land purchase, consenting (including baseline environmental assessments and environmental impact analysis), detailed design and construction.

The resource consent process, and therefore its timeline, is highly influenced by the processing technology, the site location, surrounding environment and potentially public acceptance of the proposed solution. Without this detail, the exact timeline and complexity of the process is difficult to predict, however, the implications of a complicated process can be lengthy and expensive. Should the Environment Court become involved this will further impact on timelines.

Further to this, it is also worth considering the implications of potential consent conditions. Again, these are likely to be highly dependant on processing technology, site location and any public objection. However, as odour, run-off management etc are potential negative consequences from some of the processing options being considered, the ability to effectively and continuously comply with such conditions needs to be well understood.

Figure 5.1 provides an indicative timeline for procuring collection and processing of organic materials. The individual task durations are conservative, but the overall timelines illustrate some potential challenges. Points to note include:

- The need to commence organic materials collection procurement soon to ensure that new services can be in place for Porirua and Wellington when the current contracts expire in mid-2026.
- The difficulty in procuring and implementing new processing arrangements with a possible five year lead time including consenting, design and construction.
- The processing tasks assume that consenting, design and construction commence once a processing contractor is appointed. If the councils develop the site and then procure an

operator these tasks could take place in a different sequence. There will still be a need to procure consenting, design and construction i.e. timelines will be broadly similar but in a different sequence.

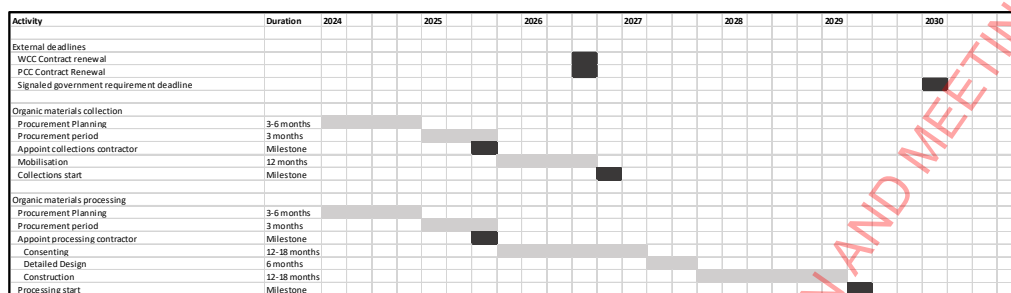


Figure 5.1 Indicative implementation timeline - collections and processing.

5.5 Constraints and dependencies

Although the central government timeframe provides sufficient flexibility for a collections procurement process to be undertaken; there are several other dependencies and constraints that need to be factored into the process. These include:

- Procurement and construction of an organics processing facility/s or procuring organic materials processing.
- Alignment with other contracts:
 - WCC and PCC have collections contracts that are approaching their end dates. This creates an opportunity for review and alignment of services and associated funding methodologies.
 - HCC are two years into their new collection contract (8+2 years), albeit already have an opt-in green waste service within its scope.
- LTP 2024 processes are currently underway for all three councils. This allows an opportunity for each council to effectively plan and budget for any changes or new services.
- Contestable funding for container purchase and establishment of organic materials processing is available from the MfE until June 2024.

5.6 Organic materials collection and processing procurement recommendations

The brief analysis presented here underlines the need for the councils to commence procurement planning if new organic materials collections are to be implemented as part of new collections contracts in Porirua and Wellington. There is potential for a combined approach, sharing resources through the procurement process and potentially coordinating ongoing service delivery across two or more councils.

Any new organic materials collection will require suitable processing arrangements. The timeline presented in Figure 5.1 suggests that a new facility in Wellington could take five years to develop and procure. This means that a new service implemented in line with new recycling and waste collection contracts in mid-2026 may require an interim processing solution should the councils decide to develop processing within the Wellington region.

There is certainly potential to collaborate on procurement and service delivery across the three councils. Working through procurement planning, supported by an analysis of service delivery

options (including joint working) will provide a basis for analysing various approaches and allowing each council to determine their preferred approach. An ideal approach will allow the three councils to maximise efficiencies and economies of scale but also enable some flexibility for response to individual timeframes and LTP requirements. A joint approach will also build on the joint application for funding from MfE to support service establishment.

5.7 Procurement plan scope

Drawing off the information included in the Organic Options Report and this business case, the procurement plan should include:

- Key project information including project objectives.
- Overview of what is being procured and the related costs.
- Governance arrangements.
- Key stakeholders.
- Engagement plan.
- Sourcing plan including procurement approach and evaluation process. This should also include information on any alternative proposals.
- Any exclusions or exemptions.
- Contract information.
- Overview of risks and probity.
- Procurement timetable.

5.8 Procurement risks and opportunities

A preliminary analysis of procurement risks and opportunities is provided in Table 5.1.

Table 5.1: Procurement risks and opportunities – preliminary analysis

Risk	Threat or Opportunity	Comment
Limited Contractor interest	Threat	To be managed by early engagement with potential contractors and developing a fair and reasonable allocation of risk in the approach adopted.
Community partnership model	Opportunity	There is potential for iwi or a community/non-profit organisation to work with Council as a contractor or in a bespoke partnership model.
Waste generators and transporters may not use the facility	Threat	It is not possible to control the market for management of organic waste across the wider region. It is possible to provide a facility that is attractive to users with a suitable location, quality of service and pricing.
Safe operation	Threat	To be managed through robust health and safety planning and management by Council and the selected contractors.
Local economic benefit	Opportunity	To be incentivised through 'social procurement' approach applied through specification development, tender evaluation and contract management.
Secure sufficient throughput	Threat	Securing feedstock is highly reliant on the type of FOGO model adopted and a proportion of commercial organic waste generated in the region. This business case should be reviewed when detailed FOGO collection model planning is underway.

Risk	Threat or Opportunity	Comment
Market risk	Threat	Processed materials may require product and/or market development to secure sustainable outlets. To be managed collaboratively by the councils, the operator and potential markets/users of materials. Prior to project establishment complete early engagement with potential markets and users of materials to develop product (s) that is fit for local end market uses.
Market risk	Threat	There are no secure outlets for recovered materials or the value is lower than anticipated.
Market risk	Opportunity	New/additional outlets for processed materials are identified and/or the value is higher than anticipated.
Synergies with other activities	Opportunity	To be incentivised through procurement approach and managed proactively during operation.
Timeline	Threat / Opportunity	The selected procurement process introduces additional time into the project timeline. This will vary by approach adopted: - Separate design, build and operate arrangements are straightforward but two or three procurements will add time to the overall project. - Combined contracts (design-build, design-build-operate) and collaborative arrangements will add complexity meaning individual procurements are likely to take longer, but may not impact on the overall project timeline. Options and cost and timeline impacts should be examined through a detailed procurement planning process.

6 Management case

6.1 Project activities

A range of activities will need to occur to fully implement the organic materials collection and processing. The activities are set out in Figure 6.1 and discussed further below.

Key 'external' deadlines are contract renewals in mid-2026 (Porirua and Wellington) and the signalled requirement to have organic materials collection and processing in place by 2030. These timelines are considered locked in place and may drive some activity.

The procurement timeline for collections suggests a mid-2026 contract start date is achievable but challenging. Some of the tasks would need to be completed in less time than is shown in Figure 6.1 with potential to complete procurement planning and procurement documentation in less than six months each. Key project activities are set out below.

Table 6.1: Project activities

Activity	Description
Funding bids (LTP)	Councils are in the process of submitting bids for funding in their respective LTP.
WMF Application	Councils have submitted a joint Expression of Interest for capital funding (bins and organic materials processing infrastructure). There will be additional work required if the WMF decides to progress to a funding arrangement, likely in Q1 and Q2 of 2024.
Joint working arrangements - initial discussions	Councils will need to continue discussions on how to collaborate on subsequent stages of the project. This may take the form of the existing, relatively informal arrangements or a move towards more formal collaboration on procurement and/or service delivery. This will need to commence in early 2024 and may progress over a year or more depending on the arrangements proposed.
Procurement Planning	Planning for procurement of collection and/or processing will need to commence in Q1 of 2024 to enable new collection contract(s) to be in place by mid-2026.
Collections - Define Services and areas	Collection service configuration and areas covered will need to be defined to inform procurement planning and procurement document development. This is likely to involve significant data analysis (service properties, rates database matching) and potentially engagement with potential suppliers of collections and processing services.
Collections - Confirm processing arrangements	Processing arrangements for collected organic materials will need to be confirmed prior to finalising organic materials collection services. This may take the form of long term processing arrangements, interim processing arrangements and/or a confirmed intention to develop a processing facility.
Collections - Community engagement/roll out	Roll out of organic materials collections will require substantial public education and information preceding roll out and on an ongoing basis.
Processing Facility	Any processing facility development will require baseline data collection, design and consenting and construction prior to commissioning for use.

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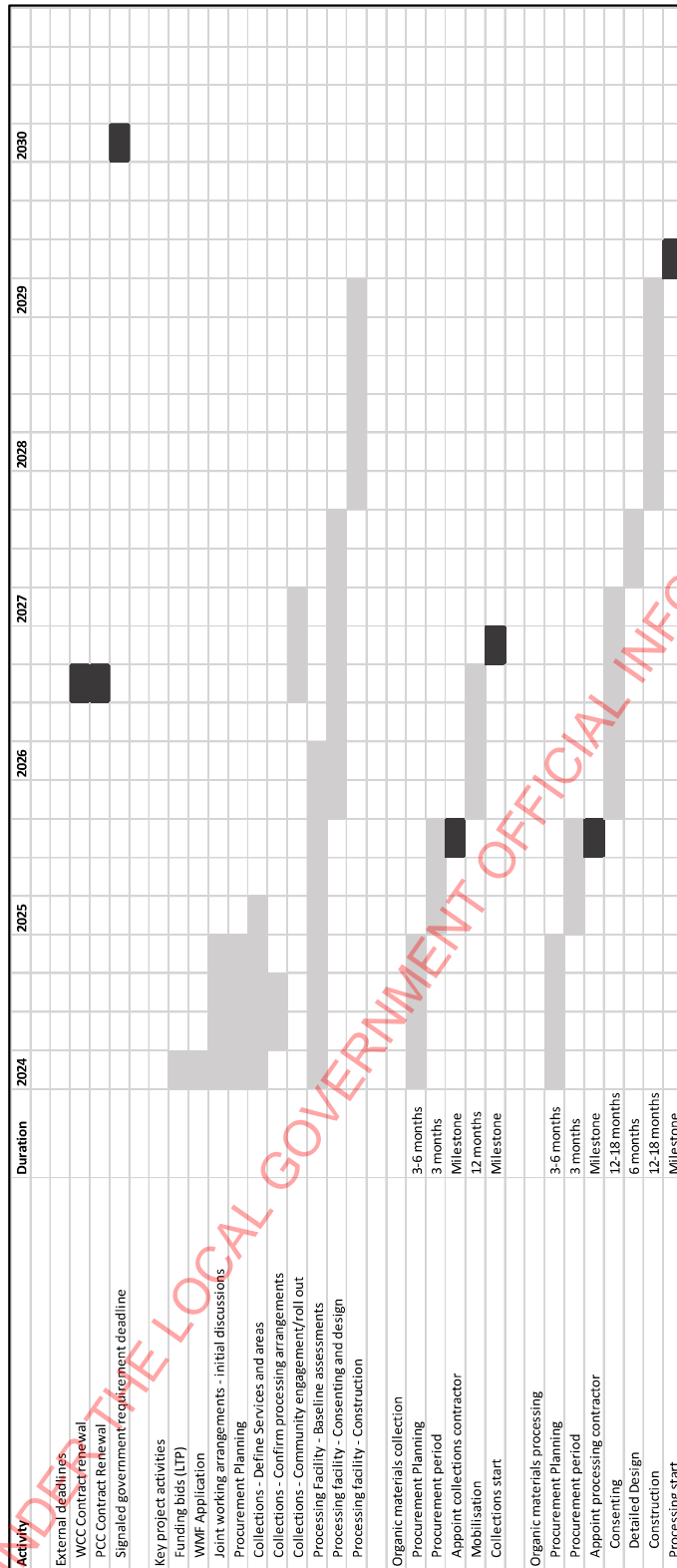


Figure 6.1 Indicative timeline for key project activities.

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6.2 Project governance

The governance and delivery arrangements for the project are likely to involve all three councils in some way. Each of the three councils will have organisation specific considerations such as:

- Current collection contract timeframes, conditions and obligations.
- LTP budget planning and processes.
- WMMP development and actions.
- Tracking against central government introduced diversion targets.
- Current budget availability and use of waste funds.
- Existing financial constraints such as lending caps.
- Internal policies and procedures.
- Governing body priorities and preferences.

Some of these considerations may limit the way forward for some councils. Others may create an opportunity for change. Full consideration of these aspects will need to be taken individually and collectively by the three councils in order to best manage their implications for the progression of this work and in particular the governance of any processing facility.

6.2.1 Local Government collaboration

Formal partnerships between local government organisations can take place under the oversight of a Joint Committee established under the relevant provisions of the Local Government Act. This involves an agreement between the participating organisations and may involve the delegation of some decisions from the individual local authorities. A joint committee provides governance or oversight but cannot own assets.

There is also potential for a CCO or CCTO to be jointly owned by the three local authorities. The CCO or CCTO is a discrete entity, often employing business management approaches including having a competency-based board setting direction for the organisation, to deliver specific services or activities for the owner council (s) and potentially other parties. A CCO or CCTO can manage assets on behalf of owning councils or own and manage its own assets. A CCO can also seek its own funding if required although CCO financials form part of each owning council's financial position.

In both cases, there is potential for the participation (Joint Committee) or ownership (CCO/CCTO) to change over time. This means that the three councils could establish an entity with other local authority partners joining at a later stage.

6.2.2 Private sector partners

A key decision, that will inform the operating model options, is whether the council/s want to enter a formal partnership with a private sector partner. A formal arrangement with a private sector partner could take the form of a CCTO (Council as the controlling party) or other structures such as a Limited Partnership, Limited Liability Company (Council not a controlling party) or unincorporated Joint Venture.

For a partnership with the private sector, those in governance roles would be expected to focus on cost effective delivery, innovation and delivering a return to their respective organisations. The benefits of this approach include a focus on commercial discipline including delivering on outcomes agreed with the owning entities and maximising return. For this approach careful consideration needs to be given to ensure that commercial and non-commercial objectives are given appropriate weight at a governance level.

6.2.3 Governance model options

Table 6.2 summarise the various possible operating models with commentary on the advantage and disadvantages.

Table 6.2: Governance model considerations

Model	Advantages	Disadvantages
Individual Council	- Current situation i.e., no change required, relatively simple. - Retains individual Council control over services/contracts.	Doesn't provide for joint development of processing infrastructure.
Joint Committee	- Mechanism to involve one or more local authority partners. - Can work with in-house management, Business Unit or CCO management of service delivery. - Relatively simple – makes use of the councils governance structures with appropriate delegations.	- Requires delegation of decision making to Joint Committee (may require testing certain decisions with participating councils). - Direction set by agreement and terms of reference from participating councils, i.e., subject to multiple parties agreeing. - Does not address project/contract management – requires one of the participating councils or other entity to manage service delivery on behalf of the participating councils.
Council Controlled Organisation (also Incorporated Partnership)	- Introduces business style approach (potential efficiencies, clear service level agreement) to management of contractor delivery of services. - Council retains high level of control, allows for a focus on council objectives. - Potential to introduce local authority partners. - Provides for separation of financial and operational risks from council.	- Council still carries risk (subject to details of CCO establishment and contract terms with operations contractor regarding operational and materials ownership). - Costs associated with CCO management and systems (separate from Council) - introducing a new layer of management/administration – council agreement with CCO for service delivery + CCO contract with service provider(s). - Not suitable for a partnership where profit is an objective.
Council Controlled Trading Organisation (Limited Liability Company or similar)	- Introduces business style approach (potential efficiencies, clear service level agreement) to management of services. - Limited liability to councils - Return margin (or portion of margin) to Council. - Potential to introduce private sector and/or local authority partners. - Council retains high level of control, allows for a combined focus on councils objectives and profit.	- Costs associated with CCTO management and systems (separate from Council) introducing a new layer of management/administration – council agreement with CCTO for service delivery + CCTO contract with service provider(s). - Profit objective may conflict with broader council objectives.

Model	Advantages	Disadvantages
Joint Venture or Partnership	- As above. - Assume joint venture with private sector and potential local authority partner (s) - Return margin (or portion of margin) to councils. - Councils retain some control (depending on joint venture structure and objectives), allows for a combined focus on councils objectives and profit.	- Costs associated with entity management and systems (separate from councils). - Introduces a new layer of management/administration – council agreement with Joint Venture for service delivery + Joint Venture contract with service provider (s). - Profit objective may conflict with broader councils objectives.

In summary, in considering the governance model, councils may want to consider the following:

- If collections and processing are to be contracted, individual is workable, but may miss some opportunities.
- There may be benefits – cost of procurement, scale efficiency – from joint procurement and contracts.
- If processing infrastructure is to be developed either single council will need to develop or Councils will need a joint structure, probably a CCO, CCTO or JV structure.]

6.3 Constraints and dependencies

Dependencies for the default options include:

- Impact on wider council collections and contracts – i.e., fortnightly rubbish.
- MfE funding processes and preferences.
- Process timeline – procurement, construction, lead in time.
- Individual councils TLP processes and political decision making.
- Availability of suitable land.
- Identification of suitable and sustainable markets.
- Changing policy environment.
- Interest and availability of processors.

6.4 Risk Analysis

This project is classified as a standalone project of medium to high risk and complexity. This reflects a potentially complicated construction project, combined with simple but new service offering for waste contractors and businesses across the council areas.

A risk register is included as Table 6.3Table 6.3: . A preliminary evaluation of risks associated with procurement are also noted in Section 5.8.

Table 6.3: Risk register

Risk	Likelihood (L, M, H)	Severity (L, M, H)	Mitigation	Residual Risk
National Waste Action and Investment Plan (AIP) focuses on organics infrastructure and may determine an outcome which might not align with the findings of this work.	L-M	M	Early and ongoing engagement with MFE to agree on an aligned approach to organics processing for the region.	
Uncertainty regarding processing location limits full assessment. This may create uncertainty or increased consenting risks to be considered at the procurement stage.	H	H		Consenting process is lengthy and complicated.
The absence of any Iwi input on processing options may result in a lack of understanding by the project on Iwi preference or concerns. Deferring this to later stages of the process may result in an unfavourable cultural impact assessment. This may impact consenting timelines, PR and political support.	M	H	Present the shortlist of options to Iwi for initial consideration and input. With the aim being to highlight any specific concerns prior to procurement.	Consenting process is lengthy and complicated. Iwi-Council relationships need attention.
Funding applications may be unsuccessful or individual Council contributions may not be secured.	M	H	Early and ongoing engagement with MFE on WMF application/s. Proactive approach to the council's budget bids and LTP work.	Alternative funding sources or procurement processes (i.e., public-private partnerships) needed to offset the shortfall.
Increased national demand for organics management solutions limits availability of solutions providers, relevant technology and onsite scientific/technical operational input.	M	H	Notify potential operators with sufficient time. Allow for expressions of interest prior to tendering and meet with interested contractors to discuss timelines. Allow sufficient flexibility in decision making to enable suitable work arounds.	Prolonged lead-in time which may need introduction and use of an interim solution.

Risk	Likelihood (L, M, H)	Severity (L, M, H)	Mitigation	Residual Risk
Deferring a decision on processing to procurement, risks creating a barrier or limiting community providers capability to effectively input, contribute and respond. This may result in negative community response, and an assumption of being shut out of the process. As there is considerable political interest in the ability for community providers to be a part of the solution, this may create unfavourable and complicated political decision-making environments.	M	M	Engage with community partners to better understand capability and interest. Include Social procurement requirements as part of the procurement approach to enable community involvement and encourage sector partnerships.	Procurement and subsequent consenting process is lengthy and complicated. Community-Council relationships need attention
Risks to the environment and human health are not managed resulting in amenity impacts.	M	H	Selected operator has experience managing organics processing facilities and environmental compliance. Careful selection of location and technology to minimise offsite impacts.	
End product fails to comply with quality standards (NZS NZ4454:2005), thereby impacting suitability for use in any identified end market.	L-M	M-H	Selected processing option includes technology or processes to remove contaminants (such as plastics, glass and stones etc). End product is assessed and tested for compliance against relevant standards.	Lower quality outputs may limit end market options.
Impact of increasingly intensive adverse weather conditions, particularly for open-air operations.	M	M-H	Site selection to consider implications of changing weather-related events. Site design to include resilience mitigations where necessary. Councils to consider impacts of weather events on waste and resource recovery infrastructure and logistics as component of Disaster Waste Planning processes.	Consequential shut down time to respond to damage or issues post-events.
Lack of viable and sustainable markets for products from organic materials processing.	M	H	Develop a clear market development and marketing strategy for each product. Require organic materials processing contractors to report on market development and sales activity as part of any supply or processing contract. Councils to use product in their own operations where appropriate – biogas, compost, digestate.	

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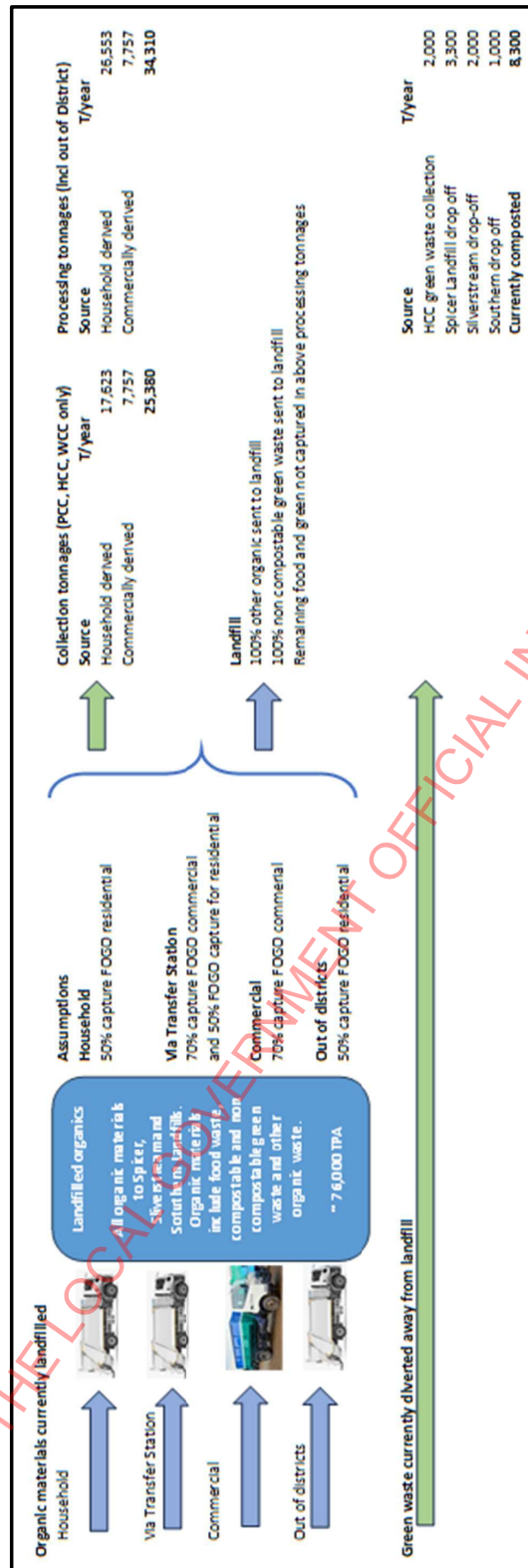
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Appendix A Organic materials flow overview



Appendix B Collection and processing options summary

Appendix B Table 1: Collections options evaluation summary

Criteria	A. Green waste only*	B. Food waste only	C. A combined green and food waste collection service	D. Separate collection of green waste and food waste
Technical risk				
Flexibility	Not suitable to business and multi-unit developments. Limited ability to respond to legislative changes.	Collection methodology limits flexibility to respond to customer needs, particularly businesses. Limited ability to respond to legislative changes.	Collection methodology can be adjusted to suit customer needs.	Collection methodology can be adjusted to suit customer needs.
Markets				
Capital cost				
Affordability (Council, ratepayers, businesses)	Lowest cost of all services in the range of \$70-\$106 per annum, per household.	Good affordability in the range of \$71-106 per annum, per household. Noting that manual collection likely to impact costs.	Medium costs in the range of \$86-190 per annum, per household. However, users have access to both green waste and food waste through a single service.	High costs in the range of \$140-\$210 per annum. Per household.
Diversion from landfill	Low diversion as only green waste collected.	Medium diversion as only food waste collected.	Good diversion as both green waste and food waste collected and flexibility to effectively suit commercial customer needs.	Good diversion as both green waste and food waste collected and flexibility to effectively suit commercial customer needs.
Environmental impacts				
Greenhouse gas emissions	Low GHG emissions savings as only green waste collected. Emissions form collection are low in comparison with other options due to the 4 weekly frequency of collections.	Medium GHG emissions savings as only food waste collected. Medium collection emissions.	Good GHG emissions savings with both food waste and green waste collected. Emissions form collections are in the lower end when compared with the other options. The combined collection approach aids in reducing collection emissions.	Although good GHG emissions savings from collection of both green waste and food waste, the methodology of two separate collections means that this option has the highest collection emissions.

Appendix B Table 2: Processing options evaluation summary

Criteria	4. Vermicomposting	5. Aerated static pile composting*	6. Windrow composting	7. In-vessel composting*	8. Wet anaerobic digestion	9. Dry anaerobic digestion *
Technical risk	Established, low-risk approach in NZ for food waste	Established approach in NZ and internationally for food and green waste	Established, low-risk approach in NZ for food waste	Established approach in NZ and internationally for food and green waste	Established approach in NZ for biological sludges, with processing of food waste established internationally	Emerging technology - Not established in NZ or Australia, established internationally
Flexibility	Most suitable to food waste, limited green waste processing capability	Suitable for food and green waste	Most suitable to green waste	Suitable for food and green waste	Most suitable to food waste, consistency of material is important	Suitable for food and green waste, including agricultural waste
Markets	Established demand for outputs	Sufficient demand for compost but quality of output can impact viability of some markets	Sufficient demand for compost but lower quality of compost from this process limits markets	High quality output meets needs of established markets	Viable markets for biogas, digestate markets will need to be identified	Viable markets for biogas, digestate markets will need to be identified
Capital cost	Simple processing so low investment but large land area needed which increases CAPEX costs	High CAPEX costs associated with land and equipment	Simple processing so low investment but large land area needed which increases CAPEX costs	High CAPEX costs associated with equipment and also land for pre-processing and maturation	Medium CAPEX costs associated with equipment, but low land costs. Additional costs possible if dewater required.	Medium CAPEX costs associated with equipment* but low land costs.
Affordability (Council, ratepayers, businesses)	Medium processing costs – to account for land needs	Medium to high processing costs – to account for staffing and equipment maintenance	Medium processing costs – to account for bulking agent costs	High processing costs – to account for power, water, bulking agent and staffing	High processing costs although potential to offset through sale/use of biogas	Medium to high processing costs although potential to offset through sale/use of biogas
Diversion from landfill						

Environmental impacts	Risks relating to odour and water impacts	Risks relating to odour and water impacts	Risks relating to high-nutrient run off and odour	Low risk as process is contained and controlled	Low risk as process is contained and controlled
Greenhouse gas emissions	The low emissions from composting is offset by avoiding landfill disposal. However, limitations of food waste only reduces potential	Low emissions from composting, offset by avoiding landfill disposal of organic material	The low emissions from composting is offset by avoiding landfill disposal. However, suitability to green waste only limits organic waste offset potential.	The low emissions from composting is offset by avoiding landfill disposal of organic material	Low emissions from process are offset by use of biogas and avoiding landfill disposal

* As this is an emerging technology there is limited information available specific to dry anaerobic digestion.

Appendix C Materials management

C1 Organic material management options

C1.1 Food rescue

Food rescue involves the collection and redistribution of surplus food within a community. Typically, unsellable food is collected from retail outlets by volunteers and is then sorted, stored, and given to community groups and/or people in need. Examples of food rescue in the Council areas includes Kiwi Community Assistance (KCA) (Lower Hutt and PCC), The Free Store (WCC), and Kaibosh (Lower Hutt, PCC and WCC).

A number of organisations who facilitate food rescue, including KCA and Kaibosh, place a dual emphasis on reducing food waste and addressing food poverty. With this, the redistribution of surplus food can provide significant social, environmental and economic gains. These gains are most effectively captured when food redistribution occurs at a local scale e.g., food is collected from a supermarket and given to a community group in the same suburb or town. This is because costs such as volunteer hours, transport, and energy used to store food are minimised. Through stakeholder engagement, it has been established that food rescue in the Council areas does occur at this scale.

Food rescue sits below source reduction for the fact that the redistribution of food can still require significant resourcing. As mentioned, in the local context these resources have, for the most part, been minimised.



Photograph Appendix C.1: Food Rescue (Kaibosh).

It is also worthwhile to note that with food rescue, there is still a loss of value. The retail price of the item is unlikely to translate to the same value in terms of economic, social and environmental gains, particularly when adjusted to include the resources used in the redistribution process.

At an operational level, food rescue organisations in the Council areas have indicated that they are struggling to meet the demands of retailers who supply surplus food. This underlines the need to focus on avoiding waste before redistribution of unwanted food. There is a risk that food rescue organisations are seen as a substitute for waste removal services, removing 'donated' food at no cost. This is in contrast to the same food being removed as waste at a cost to the retailer.

Food rescue organisations have also indicated that under the Food Act 2014 Food Safety codes and standards must be met in order to remain operational.

C1.2 Stock feed

Discussions with the stakeholders have indicated that they have successfully been diverting commercial organic material from the Wellington to stock feed. In general, this is achievable due to the ability to manage consistency and quality through well-defined inputs, for example from food processing or hospitality. However, the quality of inputs varies on a case by case basis given there are unique relationships, transport and other logistics associated with each diversion arrangement. In some cases staff time and/or available space may limit the separation of materials suitable for stock feed.

Large scale diversion of municipal food waste to stockfeed is not generally considered feasible. This is due the potential for contamination and uncertain storage times impacting on the ability to meet quality and safety requirements under the Biosecurity (Meat and Food Waste for Pigs) Regulations 2005.

C1.3 Community composting

Community composting may operate under a number of different models. Regardless of the model, a focus on keeping resources in the community to be used by community remains.

Community composting may be set up so the household takes their food/garden waste to a local garden, environment centre, or otherwise, for no cost. With this, the household would generally not expect anything in return, however generally they may receive a koha such as produce. The household may also pay to have their food/garden waste collected, where it is similarly distributed to a local garden, environment centre, or otherwise. Indicatives prices for community composting in the council areas can be found below.



Photograph Appendix C.2: Community Composting (Nelson Environment Centre).

Appendix C Table 1: Kaicycle pricing for community composting²⁷

Service Type	Price	Notes
Household Drop-off	\$17.25/month	
Household Collection	\$34.50/month	Maximum 20L/week
Business Collection	\$69.00/month	Maximum 20L/week

²⁷ <https://kaicycle.org.nz/our-services>

A number of community composting initiatives are associated with community gardens. Under this model people drop off their food/garden waste, and the community garden uses this as an input for compost that is applied to their garden. People may receive the produce grown as a result of their contribution, or the produce may be redistributed in the community based on other criteria.

Although community composting has similarities to home composting, the community centred nature means that members of the community with a strong knowledge of composting can ensure a high quality of outputs. It also provides space for members of the community to connect and share knowledge. There is often a considerable reliance on retaining volunteers to uphold the service, associated benefits and the high standard of outputs.

Community scale composting is not considered viable at a city wide level but can work alongside commercial scale organic material management.

C1.4 Vermicomposting

Vermicomposting relies on the use of worms to rapidly break down organic material. Vermicomposting can handle a wide range of organic materials but still requires inputs to be monitored and balanced. This method can be practiced at a household level with consumer worm bins and DIY systems available or at a commercial scale. Whywaste offer subscriptions for either self-managed, or expert-managed worm farms for homes or businesses²⁸.

The two outputs of vermiculture, liquid (worm tea) and solid (worm castings) are both sought after for their soil amending properties. At a commercial scale, the period for processing material can vary from 12 weeks to 18 months depending on the level of management and period of maturation.

Currently the larger vermicomposting businesses take advantage of substantial available land area, allowing limited movement or management of materials during processing. The closest commercial scale facility is in Taupo (a MyNoke site²⁹), with the development of other sites across New Zealand in consenting phase.



Photograph Appendix C.3: New Zealand Vermicomposting Operation (MyNoke).

²⁸ <https://www.whywaste.co.nz/>

²⁹ <https://www.mynoke.co.nz/>

Larger green waste from the garden such as logs, branches, grass clippings are unable to be processed via vermiculture. As a result, vermicomposting and composting are often seen as complimentary processes suited to handling different organic material streams with vermicomposting better suitable to food only and similar streams.

The solid outputs from vermiculture (castings) are nutrient dense and have a high moisture content and dense structure. Castings do not require maturation prior to use. They can be used directly on soil, blended, or used to boost microbial activity in other composting systems. The worms, feedstock mix, and system require careful management to ensure worms remain productive.

C1.5 Static pile composting



Photograph Appendix C.4: Static pile composting.

Conventional static composting involves placing the composting mix in 'piles' with composting taking place over a much longer period than turn pile methods. Static composting avoids the turning of composting materials to enhance aeration during the initial phase or processing. Aeration occurs through air circulation within the composting mass meaning that selecting a bulking agent that creates air voids is an important consideration. Heat generated by biological activity also creates some air movement through convection.

C1.5.1 Aerated static pile composting

Aerated static composting operations use the same method but with material laid over pipes which either pump air into or draw air through the piles. Drawing air through the piles can allow for discharge via biofilter, reducing the release of odour. When air is blown into piles, laying a cover of mature compost over new material effectively creates a biofilter for air discharged from the composting pile. Without the need to turn the piles to maintain aeration, the required land area is reduced.



Photograph Appendix C.5: Aerated Static Pile Composting Operation.

The quality of output materials can be poorer than for windrow (6.4.6) or in-vessel (6.4.7) composting due to the inconsistency of static pile temperatures and moisture levels leading to variable degradation and stabilisation throughout the pile. This limits the use of output materials as they may require blending with other processed organics to reach accreditation requirements. However, this processing approach is straightforward and requires a medium amount of intervention.

Examples of static pile composting operations in New Zealand include:

- EnviroFert (Tuakau).
- Envirowaste (Hampton Downs), using gore cover.

Both sites process a mixture of green waste, food waste and similar materials which fundamentally act as bulking agents.

C1.6 Windrow composting

Windrow composting is an aerobic, hot method of composting, that breaks down organic materials in around 10-20 weeks. Oxygen is provided to the microorganisms by periodically turning the piles. Windrow operations are limited by the available area and can easily be expanded if space is available. Turning can be achieved using standard earthmoving equipment or specialist compost turners (refer Photograph Appendix C.6).

The end product is a quality compost which can be blended and sold to be used in residential gardeners or large-scale agriculture. The nutrient content, structure and moisture retention qualities, of windrowed material is lower/poorer than in-vessel output material, reflecting limitations on processing some materials. However, the windrow system typically requires less infrastructure, repairs, monitoring and maintenance than in-vessel composting.



Photograph Appendix C.6: Open Windrow Composting with a specialist windrow turner.

Water management is important, both to maintain a suitable moisture content during processing and to capture and treat the nutrient rich runoff from the composting area. The risk of odour complaints is also higher with windrow than aerated, in-vessel or vermiculture based systems due to the need to turn materials and potential to expose anaerobic (high odour) areas within the windrows with limited control of air discharges.

To maintain a successful windrow, compost an equal balance of carbon and nitrogen rich materials needs to be provided. This needs to balance a range of inputs, potentially including nitrogen rich materials (food waste, grass clippings, leaves) and carbon rich bulking agent (woody green waste, wood processing residue, paper). The bulking agent also assists with allowing airflow within the composting mass, improving aeration between turning cycles. The main challenges for windrow composting include managing leachate and odours during operation.

In many jurisdictions, municipal and industrial food waste is not permitted in windrow composting facilities due to the risk of odour issues and vermin. In practice, well managed windrow composting with appropriate buffer distance can process a small proportion of food waste and similar materials with limited odour impacts. However, for large scale processing in-vessel processes are likely to be preferred (Refer Section C1.7). Capital Compost is an example of a windrow composting operation processing food waste alongside greenwaste.

Windrow composting offers a relatively simple, medium intervention management system, but typically produces lower nutrient soil improver products (due to the range of materials that can be processed). Windrow processing bears a higher risk profile for odour complaints than some other options.

Examples of windrow composting in New Zealand include:

- Capital Compost, Southern Landfill, Wellington.
- Composting New Zealand, Otaihangā.
- Waste Management, Tirohia.
- Daltons, Matamata.
- Revital, Cambridge.

C1.7 In-vessel composting

In-vessel composting has been used in a wide range of urban and rural settings since the early 2000s and offers a higher order technology option to basic windrow composting. In a typical enclosed system, semi-automated aerobic hot composting takes place within a controlled environment and supporting specific bacteria to process the organic material.



Figure Appendix C.7: In-vessel Composting System (for example HotRot, Bighanna composter).

Materials are placed within a drum, silo, bag or 'tunnel'/channel with forced aeration allowing for a high level of automated and/or manual control over the temperature, airflow and moisture content. This approach provides for initial processing times of around 7-10 days – shorter than similar initial processing stage in windrow composting. Operations can often be expanded by introducing more vessels in a modular fashion. The containment and high level of control results in the process being more expensive than other forms of aerobic composting when initial composting and maturation equipment and timeline are considered.

In-vessel systems are based on the same principles as windrow composting, with initial composting activity enhanced by the controlled environment. The materials are pasteurised during the initial process due to the high temperatures achieved in-vessel from the microbial activity. Following initial rapid processing materials require 'maturation', typically in open windrows, before use.

Due to the ability to process high nutrient feedstocks, output materials from in-vessel composting are often superior to those from windrow, including better moisture content and retention, better structure, and better nutrient content. The output products can be used after as little as 4-6 weeks on a maturation pad after the initial in-vessel processing. Output materials are more consistently pasteurised and processed when compared to windrow processing, particularly for in-vessel processes that incorporate regular mixing.

Regulatory authorities in the UK and Australia consider in-vessel composting lower risk than basic windrow systems. This is because air emissions are usually biofiltered, emissions are reduced significantly, and the risk of odour complaints is low. Fully pasteurised materials that are outputted after in-vessel treatment are also pathogen free (due the high temperatures achieved). In-vessel systems are often used to manage municipal food and garden waste due to its scalability and low complaints profile.

In-vessel composting requires power, water, bulking agents and staff to be available on site for adjustments to the process if required. It requires monitoring and control either remotely or in-person by a well-trained operator. Some maintenance and repairs are required, particularly for highly mechanised and automate systems.

With materials contained during processing, getting the feedstock mix is very important with limited opportunity to adjust the mix until the processing is complete.

Examples of composting systems that combine features of aerated static pile and in vessel systems in New Zealand include:

- Extreme Waste, Raglan – a simple covered channel system with an aeration channel with excavator used for turning and moving materials (Horizontal Composting Unit).
- EnviroWaste, Redruth (Timaru) - Gore systems (aerated, covered static pile system), a similar system to the Hampton Downs facility is under development.

C1.8 Anaerobic Digestion

Anaerobic digestion (AD) occurs within a sealed vessel without the presence of oxygen. The process uses different micro-organisms to aerobic composting, adapted to an oxygen free environment. The process is generally well suited to higher nitrogen content waste materials and is commonly applied for wastewater solids (municipal and industrial). More recently AD has also been employed for the processing of food waste.

C1.8.1 Wet Anaerobic Digestion

In a wet AD process, organic materials in liquid form are fed into vessels to be broken down by microorganisms to produce biogas (a CO₂ and methane mixture) and digestate. The value from anaerobic digestions is predominantly through the sale or use of the biogas. Biogas is often used to heat and condition spaces such as greenhouses but may also be used to generate power. The process is best suited to waste with a very high moisture content. The liquid digestate can be used as a fertiliser in liquid form or dewatered prior to use.



Photograph Appendix C.8: Ecogas facility, Reporoa (from www.ecogas.co.nz).

While it is possible to extract some value from the digestate, it can be spread in liquid form. A wide variety of organic material can be processed by wet AD, however, a relatively consistent supply of similar materials is preferred since rapid changes can disrupt the process. Onsite wet AD can be well

suited for large industrial sites which produce a reliable supply of organic material with a high moisture content such as wastewater solids from the dairy sector. The high moisture content typically limits alternative treatment options and makes transportation difficult.

Digestate from wet AD can be used as a fertiliser for crops, or further processed into specialist chemical products for reuse. Utilising digestate as a fertilizer can reduce the need for chemical fertilizer and reduced production of these can reduce fossil fuel use consumptions and carbon dioxide emissions. Thus, wet AD can be considered as a key technology to recycle waste into value-added products and fertilizer. Dewatered digestate can be further processed through (aerobic) composting to produce a consumer or general use product.

In New Zealand an example of this system processing food waste is EcoGas (Reporoa) who are developing a wet digestion facility that will accept household food waste alongside similar materials streams including animal manures, oils, and commercial quantities of food waste.

C1.9 Dry Anaerobic Digestion

'Dry anaerobic' systems are also employed in Europe and North America, but have yet to be established in Australasia³⁰. This is a similar process to wet anaerobic digestion, but the input waste has a lower moisture content, this makes dry digestion suitable for agricultural waste such as grasses, straw, and silage, as well as livestock manure. In dry digestion systems, solid materials are treated in a batch or plug flow process. A plug flow system will circulate liquid through the digesting materials, with this process best suited to large quantities of material. The batch process approach is simpler, suitable for small scale operations, and can handle a wider range of materials including non-digestible contaminants but has reduced biogas yield.

Dry AD may offer advantages over wet AD in some situations, with it often requiring less further processing to separate processed solids from liquids, and less liquid fraction needing to be treated.



Photograph Appendix C.9: Dry Anaerobic Digestion System.

C1.10 Other processing options

To ensure all options suitable for organic material have been considered, the processing options below were also reviewed.

³⁰ A new Dry AD (combined with IVC) facility is being established in Australia – Bryon Shire Organic Waste Processing Facility

C1.10.1 Soldier fly larvae

The capability of soldier fly larvae to turn a range of inputs into livestock feeds and fertiliser is an approach under active development. WCC was approached by a researcher, John MacDonald, from Food Security Solutions regarding applying the method in New Zealand. Food Security Systems are actively promoting a Soldier Fly Larvae solution across New Zealand with a focus on understanding available feedstock.

The application of this process at an industrial scale is yet to be established in Australasia. HATCH biosystems based in Australia have successfully gained funding to expand the company's bioconversion capacity in 2022 in partnership with Cleanaway. This approach has not been implemented in New Zealand.

C1.10.2 Hydrothermal liquefaction

Hydrothermal liquefaction of wet waste for the production of liquid fuels is an emerging technology with significant potential for application at commercial scale. This technology is not proven at a commercial scale internationally and not currently applied in New Zealand.

C1.10.3 Advanced Thermal Processing

Gasification and **pyrolysis** are widely used in other countries for the treatment of a mixture of waste streams and generally for larger volumes of waste. **Torrefaction** is a refinement of gasification and is another emerging technology for improving the quality of material for fuel, combustion and gasification applications. There are some facilities which operate with lower volume feedstocks and focussed on specific material streams, typically urban wood waste or wood processing residues. Products include syngas (for further refining or energy generation), liquid (pyrolysis oil, condensate) and solids (biochar, ash). These processes also typically generate air pollution control residues that require treatment prior to disposal as stabilised hazardous waste.

These technologies are typically applied to mixed municipal solid wastes or specific industrial waste streams internationally. There are no examples of these technologies operating at commercial scale in New Zealand, and several previous attempts to establish these plants have been unsuccessful at the consenting stage. However, there is currently a consent process underway in Fielding (Manawātū District Council) for such a plant.

While gasification and pyrolysis could be applicable for the processing of organic material, capital cost, operating costs and technology risk are important considerations given the current level of full scale development in New Zealand.

C1.10.4 Mechanical biological and heat treatment

Mechanical biological treatment or **mechanical heat treatment** (MBT or MHT) is also an option employed for managing mixed waste including organic material. This suite of technologies could be employed for material from Porirua, Hutt and Wellington but are typically focussed on residual waste treatment. Key considerations include capital cost, operating costs and technology risk are important considerations given this approach has yet to be implemented in New Zealand.

In the UK, Europe, and increasingly in Australia, combined mechanical and biological treatment of residual waste is implemented. This method reduces the organic fraction of waste disposed of to landfill or sent to energy from waste facilities. The output of the biological process is typically a low-grade compost type product usable for landfill or mine rehabilitation or similar purposes³¹. In some

³¹ The NSW EPA re-evaluated the use of 'mixed waste organic outputs' from biological treatment processes resulting in the removal of some markets for the use of these materials in NSW. Refer <https://www.epa.nsw.gov.au/your-environment/recycling-and-reuse/resource-recovery-framework/mixed-waste-organic-material>

cases, the product is used as a 'Refuse Derived Fuel' for use in conventional waste-to-energy processes or advanced thermal treatment processes.

Outlets for the stabilised product have proven to be limited in Australia and there are no users of mixed waste based Refuse Derived Fuel in New Zealand.

C2 Organic material disposal options

C2.1 Landfill

Landfilling is often the final end point for unexpected volumes of organic material due to its reliability to be able to accept different volumes, ranges of material types, and contamination levels. To maximise the diversion of organics from landfill will require the cost of organics processing to be less than landfill, particularly for producers where cost is the main decision-making criteria. This is likely to vary when comparing landfill to unique processing options, and is subject to change given the direction signalled by government with regard to the landfill levy expansion.

Placing organic material in landfills should be avoided as it results in waste of a valuable resource and a lost opportunity to produce valuable soil improver products. Placement of organic materials in landfill also uses valuable airspace, contributing to a reduction in landfill lifespan. There is a limited number of landfills in the Lower North Island meaning transport costs and impacts are also a consideration. Organic materials also contribute to landfill gas generation and the associated Emissions Trading Scheme liability for landfill operators.

While material can only be diverted from landfill if there is a suitable secondary option, recovery of organic materials is likely to increase where:

- There are cost effective options to process/recover organic materials – for example supported through capital investment (including grant funding via the Emissions Reduction and Waste Minimisation Fund) and optimised service delivery.
- Where the gate fee for landfills is high compared to recovery operations, for example through increasing the disposal cost via the waste Levy.
- Pricing for the disposal of organic loads at landfill reflects their impact, particularly emissions trading scheme impacts.
- Households and businesses are motivated to divert materials to reduce emissions and/or improve materials recovery.

It is important to note that for landfill operators there are several aspects to consider with the acceptance of organic materials:

- As organic materials break down in landfill they create landfill gas (methane), creating a liability under the New Zealand Emissions Trading Scheme (ETS).
- ETS liabilities are managed by the capture and flaring of landfill gas. Effective landfill gas management is a function of landfill gas generation and the methane content of the gas. If the degradable material content in a landfill is too low there is potential that landfill gas capture and flaring will no longer be viable.
- As organic materials breakdown in landfill their volume reduces. This means unlike non degradable materials (plastics, rubble) organic material contributes to settlement of waste over time.

C3 Product end markets

A process of ongoing engagement has been underway since early 2023 with likely end market users to understand the current position that potential users of a product/s. The discussions have also started to explore the requirements of end markets. This engagement is still ongoing (May 2023).

C3.1 Product benefits

The sale of the end product is essential to the ongoing financial viability of an organic processor's operation. The value and use of the processed organics materials differs substantially depending on the type, location, quality and quantity of materials. If the product cannot be sold then landfill disposal is often the only option although land remediation may be an option in some cases.

The outputs from the different forms of organics processing (aerobic composting, anaerobic digestion and vermiculture) are typically used for their soil amending properties. The specific benefits of utilising the processed organics are dependent on the chosen product and their intended use.

Appendix C Table 2 outlines some of the key benefits from utilising the outputs. The benefits of diverting food waste for human consumption or stock feed are also noted although there are significantly different feedstock requirements.

Appendix C Table 2: Material, outputs and key benefits

Material	Key benefits
Redistributed food	Reduces food insecurity, and prevents the loss of valuable energy and/or nutrients.
Stock feed	Offsets manufactured or imported stock food reducing energy consumption and associated emissions.
Compost	Improved soil structure - Allows air and water into the soils. Improves biological, chemical, and structural health of soils.
Vermicast	Improved moisture retention - reduce water use in growing systems and landscaping. Improve nutrient retention - reduced reliance on synthetic fertilisers
Digestate (Anaerobic digestion)	Adds to soil microbiology - Improves biological, chemical, nutritional and structural health of soils. Renewable energy source (heat and power) – offsets other energy sources.
Mulch	Improved moisture retention - reduce water use in growing systems and landscaping.
Soldier fly larvae	Potential uses include stockfeed and as soil amendment.
Biofuel	Products such as 'biocrude' from hydrothermal liquefaction, pyrolysis oil and syngas (from gasification) can be used as fuel or further refined as chemical feedstocks.
Stabilised organics	Stabilised organics from mechanical biological or mechanical heat treatments have been used for land remediation or capping. Markets can be limited due to physical and chemical contamination.

C3.2 Indicative pricing

As most of these outputs are primarily used for soil improvement, they compete with both each other and other soil amending methods such as manure spreading and synthetic fertilisers. The desired soil amending product depends primarily on the cost of application and benefits of use. A range of prices for outputs from the various processing methods are presented in Appendix C Table

3. The prices presented are published prices; pricing for bulk orders and long term supply arrangements are likely to be lower.

Appendix C Table 3: Outputs - indicative sale prices (September 2022)

Output	Process	Indicative price range (GST inclusive) (Sept 2022)
Food	Food rescue	Typically donated to charities who distribute it
Stockfeed	Food rescue	Value varies significantly by product and nearby animals
Compost	Windrow, in-vessel or static composting	Retail \$115/m ³ , \$70-\$100 per m ³ bulk ³²
Vermicast	Vermicomposting	Retail \$155 - \$215/m ³ , \$30 - \$60 per m ³ bulk ³³
Liquid vermicast extract	Vermicomposting	Retail \$1,265/m ³ ³⁴
Methane	Anaerobic Digestion	3.05 c/kWh ³⁵
Carbon Dioxide	Anaerobic Digestion	CO ₂ : \$5/kg ³⁶
Liquid Digestate	Anaerobic Digestion	EcoGas are currently providing digestate to participating surrounding farms at no charge. Aiming to reclassify digestate as fertiliser and turn into a revenue stream.

*GST exclusive price.

C3.3 Council use

Council operations typically use composts and soil conditioners for landscaping (parks and gardens) and land stabilisation. Providing products of appropriate quality for supply to Council can support an 'internal market' by utilising the compost produced in the region using food and/or garden waste managed by Council. Similar users include other public infrastructure owners (Council Controlled Organisations, Waka Kotahi, Kāinga Ora, Ministry of Education and/or the new Water Service Entities (from mid-2024).

A key consideration is understanding the requirements for each use and working with the end users to specify suitable products. For example:

- Requirements for parks and reserves - growing media, landscaping, top-dressing for turf.
- Requirements for urban and rural road berms or stabilisation of slopes (erosion and sediment control).
- Commercial landscapers also use compost and soil conditioners with similar requirements to Parks and Garden likely to apply.

Initial discussions with Councils parks and gardens teams provided the following:

- PCC – use mulch and not compost. The parks and gardens team have a requirement within contracts for tree removal, that the mulched material is returned to the depot. There are times when mulch is in short supply and Councils parks and reserves team require additional supplies.

³² Composting New Zealand 2021. [Organic Compost](#) (accessed September 2022)

³³ MyNoke 2022. [Earthworm products and organic waste collection](#). (accessed September 2022)

³⁴ MyNoke 2022. [Earthworm products and organic waste collection](#). (accessed September 2022)

³⁵ Ministry of Business, Innovation & Employment 2022. [Energy prices Real and nominal price data relating to New Zealand's energy prices - petrol, diesel, fuel oil, natural gas and electricity](#). (accessed September 2022)

³⁶ Eziwap gas industrial gases 2022. [Foodgrade \(CO₂\) Full Cylinder](#) (accessed September 2022)

- HCC – awaiting a response from the parks and gardens team.
- WCC - council purchase around 16-20m3 of compost from Capital Compost each year. There is also composting onsite at Otari and the Botanical Gardens which is used by council.

C3.4 Retail

There is an active retail market for compost with bagged product available from landscaping, garden supplies and hardware retailers across the region. Bulk compost is sold by landscaping and garden supplies yards and in some case by compost operations directly. With this, there is a significant market in supplying to new housing developments.

Where materials are sold direct to the public, logistics and marketing costs can be avoided. For example, Southern Landfill processes approximately 6,000 tonnes of green waste per annum, with the majority of this being sold from the tip shop, or via bulk delivery. Similarly, Composting New Zealand utilises online ordering, and delivery to customers from their Wellington branch mini-site.

The market for bagged product tends to be dominated by national suppliers (Tui, Daltons, and Living Earth) with bagged product shipped around the country. Own brand products, typically re-branded material from the major players, are often marketed at low prices to attract customers.

C3.5 Horticulture

Horticulture is an important outlet for compost and soil conditioners across New Zealand. Organic certification has become a de facto standard for this market with BioGrow and Assure Quality the key certification providers.

In 2019 there was 1,906 hectares of horticultural land across the Wellington region³⁷. Available horticultural land was dominated by 830 hectares of wine grapes, followed by wheat, apples, avocados and kiwifruit³⁸.

There is an additional 4,870 hectares of horticultural land across the Manawatu-Whanganui region. This land is largely used for the production of vegetable crops including onions, peas, and corn. Horowhenua is immediately north of the Wellington Region with much of the vegetable production around Levin and Opiki. Cropping occurs in the southern part of the region and further north.

Application rates to horticulture crops are dependent on the local soil requirements including limits on maximum nutrient loading. As each compost product has a different nutrient content, the maximum application rates can differ. Appendix C Table 4 provides indicative application rates for horticultural applications.

Appendix C Table 4: Recommended application rates to horticulture

Product	Application rates for horticulture
Compost	10 tonnes/hectare (t/ha)
Vermicast	10 t/ha per year, 20 - 50 t/ha for initial application or to replenish soil.

From the noted application rates the suggested annual market size on horticultural land alone within the Wellington region would be approximately 19,000 tonnes of compost with additional market demand for soil replenishment. These values need to be considered alongside the use of other sources of nutrients that may contribute to nutrient caps.

³⁷ Stats NZ Tatauranga Aotearoa 2021. [Agricultural and horticultural land use](#) | Stats NZ. (accessed October 2022)

³⁸ Stats NZ Tatauranga Aotearoa 2017. [Agricultural production statistics](#). (accessed October 2022)

Horticulture in the Manawatu-Whanganui Region could use approximately 45,000 tonnes per annum on a similar basis.

C3.6 Grassland and arable crops

In 2019 there was 10,398 hectares of land used growing grain and almost 300,000 hectares used for dairy, beef and sheep farming across Greater Wellington³⁹.

There is also just over 1,000,000 hectares of grassland and arable crops in the Manawatu-Whanganui Region. This provides a significant secondary market within close proximity to the Council areas.

The application rates of compost to grasslands differ from the application rates for horticulture. Indicative application rates to grassland are presented in Appendix C Table 5.

Appendix C Table 5: Likely application rates to grassland and arable crops

Product	Application rates to grassland
Compost	3 – 4 t/ha ⁴⁰
Vermicast	10 – 20 t/ha ⁴¹

C3.7 Biofuel

Given the absence of any processing facilities it is unlikely that biofuel is a viable market for organic material. However, there is a regional trial of Mobil's ethanol blended fuel being conducted in Wellington. For this, ethanol is produced from agricultural crops including grain. This may be an opportunity to assess when the market is further established.

Wood organic materials could be processed into wood chip or wood pellets for use within the Region or further afield. Wood processing sites in Featherston and Masterton use waste wood from their own operations to generate process heat.

C3.8 Stockfeed

Feeding unwanted organic materials to stock can range in size from small scale food waste to chicken feed to large commercial piggeries and commercial food recovery to stockfeed processors. Utilising suitable organics as stockfeed is a high-value use of organic material which benefits all parties involved.

Feed for pigs is regulated as per the Biosecurity (Meat and Food Waste for Pigs) Regulation 2005, which stipulates pigs must not be fed untreated meat or untreated food waste. As per the regulation 'untreated food waste' includes untreated meat and food waste which has come into contact with other food waste that is or contains untreated meat. The regulation and MPI (Ministry for Primary Industries)⁴² states the requirements for treating food waste.

Primary suppliers of organic materials suitable for stockfeed include supermarkets, hospitality, and horticulture businesses. Rapid collection and/or appropriate storage is required to ensure organic

³⁹ Stats NZ Tatauranga Aotearoa 2021. [Agricultural and horticultural land use | Stats NZ](#). (accessed October 2022)

⁴⁰ Revital Fertilisers. [Revital Compost 50](#). (accessed September 2022)

⁴¹ MyNoke 2022. [Frequently asked questions](#). (accessed September 2022)

⁴² Ministry for Primary Industries Manatō Ahu Matua 2022. [Protect New Zealand – don't feed pigs untreated meat waste](#). (accessed September 2022)

materials arrive in a suitable condition to feed to stock. Contamination is a significant concern for recipients of diverted stockfeed, typically due to plastic packaging.

C3.9 Markets for soil amendments

Scale is an important consideration for potential markets for soil amendment products. The organic materials generated, and likely capture through the various collections approaches provides an indication of the scale required.

Landscaping and retail (bagged bulk for home use) are relatively small markets locally. Locally produced materials compete with bagged product shipped in other parts of New Zealand.

As discussed above, horticulture in the Wellington region is a potential market for compost or similar products.. Horticulture in Horowhenua is another potential market. There is also potential to use digestate in this market although specialised transport and application equipment is likely to be required.

Similarly, grassland/arable land presents a significant potential market although the use of compost and similar products is less well established in this market. As for horticulture there is potential to use digestate in this market although specialised transport and application equipment is likely to be required.

Bark and wood chip are currently used for landscaping and biofuel. They are mentioned here as potential supplementary materials (bulking agent). Given existing markets there is potential that these materials will only be available for processing of organic materials at a cost. This is in contrast to the disposal charges typically applied for green waste.

Stock feed produced locally will compete with imported materials and product supplied from other parts of New Zealand.

Further engagement with the horticulture sector is needed to determine the viability of this sector as an end market for soil amendment products.

C3.10 Biofuel markets

As noted above, bark and woodchip/waste are already used to generate process heat in wood processing sites.

Biogas is usable to generate heat and/or power. There are potential economies of scale with energy infrastructure, for example landfill gas or anaerobic digestors at wastewater treatment plants. Some heat is usable to support the temperatures required for effective digestion, often alongside power generation. The Ecogas project in Waikato combined power generation and heating of greenhouses to maximise the value gained from the biogas.

In the study area, major heat users include larger food processors (for example Whitakers, Taylor Preston). Existing biogas infrastructure is located at Southern, Spicer and Silverstream Landfills. There is a project underway to develop anaerobic digestion including biogas use at the Moa Point Wastewater Treatment Plant (Wellington).

C3.11 Summary

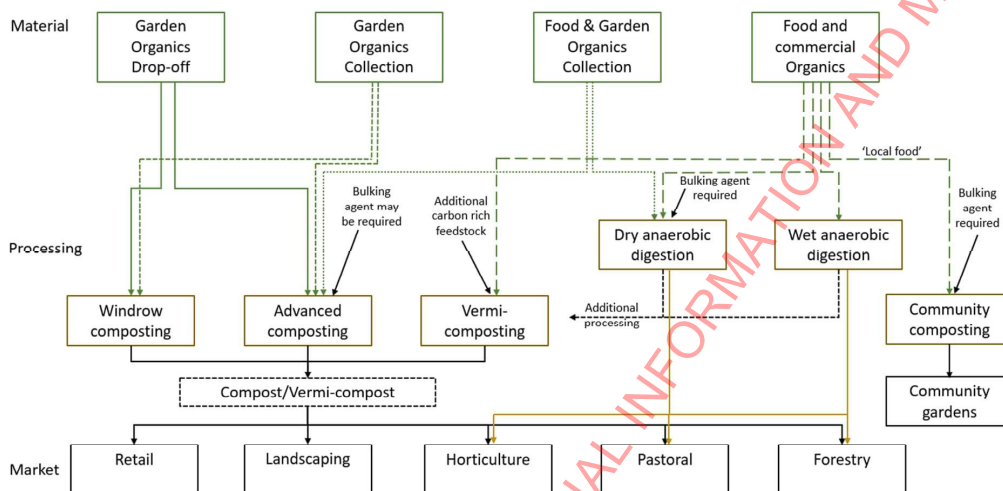
Commentary on the applicability of process outputs to different markets is summarised below.

Appendix C Table 6: Summary of potential market demand

	Landscaping	Retail	Horticulture	Grassland/ Arable	Biofuel - heat, power	Stockfeed
Compost	✓	✓	✓	✓		
Vermicompost	✓	✓	✓	✓		
Biogas					✓	
Digestate			✓	✓		
Bark ⁴³	✓	✓			✓	
Wood chip ⁴³	✓	✓			✓	
Stock food						✓

⁴³ Also may be used as bulking agent in composting

Appendix D Potential Option packages (flowchart) representations



Appendix E Kerbside Organics Implementation Funding

The \$120 million of contestable funding available until June 2024 from MfE's Te Pūtea Whakamāuru Para the WMF and Climate Emergency Response Fund includes funding for:

- The purchase of food and/or food and green waste bins (set amount per property from \$5 to \$55 depending on bin size). Note: multiple types of bins can be purchased as needed.
- The design, and distribution costs for communications and promotional marketing/education materials and related collateral — up to \$5 per property or up to \$7.50 per property where there are multiple councils jointly rolling out services.
- Coordination and project management costs for rollout (not ongoing costs) — up to \$50k for one year.

Based on the package of funding being offered by MfE, **Appendix E Table 1** outlines potential funding available for each of the organics collection options being considered.

Appendix E Table 1: Potential funding

Option	Items funded	# households (2018)*	HCC	PCC	WCC	Total
			39,549	18,858	80,688	139,095
B	Caddy	\$ 5.00	\$ 197,745.00	\$ 94,290.00	\$ 403,440.00	
	23L bin	\$ 15.00	\$ 593,235.00	\$ 282,870.00	\$ 1,210,320.00	
	Marketing	\$ 7.50	\$ 296,617.50	\$ 141,435.00	\$ 605,160.00	
			\$ 1,087,597.50	\$ 518,595.00	\$ 2,218,920.00	\$ 3,825,112.50
C	Caddy	\$ 5.00	\$ 197,745.00	\$ 94,290.00	\$ 403,440.00	
	80L bin	\$ 40.00	\$ 1,581,960.00	\$ 754,320.00	\$ 3,227,520.00	
	Marketing	\$ 7.50	\$ 296,617.50	\$ 141,435.00	\$ 605,160.00	
			\$ 2,076,322.50	\$ 990,045.00	\$ 4,236,120.00	\$ 7,302,487.50
D	Caddy	\$ 5.00	\$ 197,745.00	\$ 94,290.00	\$ 403,440.00	
	23L bin	\$ 15.00	\$ 593,235.00	\$ 282,870.00	\$ 1,210,320.00	
	240L bin	\$ 55.00	\$ 2,175,195.00	\$ 1,037,190.00	\$ 4,437,840.00	
	Marketing	\$ 7.50	\$ 296,617.50	\$ 141,435.00	\$ 605,160.00	
			\$ 3,262,792.50	\$ 1,555,785.00	\$ 6,656,760.00	\$11,475,337.50

* Stats NZ 2018 Census (place summaries) - domestic properties only

Additional project management funding available per application: \$ 50,000.00

Appendix F Capital Costs

RELEASED UNDER THE LOCAL GOVERNMENT OFFICIAL INFORMATION AND MEETINGS ACT 1987



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8 August 2023 \ Mark Abbot

Business Case Peer Review.

Organics Processing Facility.

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Peer Review – Organics Processing Facility \ August 2023\ Mark Abbot

PEER REVIEW

Indicative CAPEX and Gate Fees Assessment for Business Case: Organics Processing

PREPARED FOR

This peer review has been prepared for representatives of Wellington region Councils investigating processing options for Organic waste.

Dil Uppal Wellington City Council

Nigel Clarke Porirua City Council

Jörn Scherzer Hutt City Council

BACKGROUND

This review is based on an initial options analysis covering the establishment of a 50,000tpa organics processing facility.

It is noted in that analysis that the variables associated with the capital costs of a processing facility make it difficult to be specific on an exact cost at this options analysis stage.

This review is not purporting to be a review of any technical aspects of the processing options as we do not possess or claim to be processing technicians or environmental scientists.

While a number of statements may be offered, these should be considered as questions for further clarification; either to be incorporated or disregarded based on that consideration.

This is to provide the required clarity necessary even in an initial business case assessment process.

DISCLAIMER

The commentary provided by way of this peer review is to inform the resulting Business Case. It has been the subject of a high-level assessment only and without the level of detail that would normally be attributed to the development of a full Business Case.

Where suggested capex costs and gate-rates or opex considerations have been provided, these are based on experience of similar examples or, where that is not possible, a reasoned assessment of the data provided in the draft.

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Peer Review – Organics Processing Facility \ August 2023\ Mark Abbot

GENERAL COMMENTARY

1. The draft makes note that operational costs (opex) are to be considered differently to gate fees. Gate fees charged by a facility will be made up of a multiple component mix including amortised capital costs (financing); direct operating costs (maintenance, staff, materials, utilities, etc); Organisational overheads; and profit.

With the exclusion of profit it would be suggested that the other input costs are operational and should therefore be aligned to the opex assessment considered necessary to establish and run this facility.

It is also suggested that consequential opex could be considered. It is clear that the cost of land acquisition may not be included in this business case, unless no alternate option is available.

However, to be fully transparent, there is a cost of land use that must be factored into this investment assessment to allow for a complete base-line perspective of the establishment and on-going running costs of that facility. This land may already be held by a Council. If not, there will be a direct cost of acquisition. If land is held, there will be a cost to the owning Council for allocating its use, and a cost to participating Councils in accessing that resource.

In addition to ensuring robustness of any investment logic, all opex impacts and inputs are required to validate a robust rates assessment.

2. Associated with point 1, there are consequential opex costs that should be noted as impacting in, and through, the establishment of this facility. These costs include the purchase and provision of bins and bags, unless these are to be funded by a collection contractor, alongside the cost of collection. It should be noted that, in the event a contractor does initially fund bins and bags, that cost will be borne by Council in its contracted operational cost regardless over time.

While these costs will logically sit outside of the processing investment structure, they have a material impact on the viability of the project and overall business case and at least need to be rationalised and noted here.

3. The draft business case extract does not appear to show alignment with any strategic intent of the investors. It should be clear at this point that Councils have established an understanding of the strategic direction they wish to take in considering the investment in organic processing.

It may be that the strategic alignment has been noted separately and elsewhere. In that case, the options provided by this precursor assessment suggest that Council may be establishing a significant green waste collection and processing facility, rather than a dedicated food waste stream.

The consideration of alternatives that include extensive green waste reliance can only be useful if that is the intended course of action Councils seek to pursue.

If a food waste dominant processing option is the strategic intent of Councils then that should be noted as the driving determinant of any business case. This has a significant impact in widening or limiting the processing options available, and therefore the focus required of a business case.

A background outline of alternate processing costs can still be noted, along with reasons for discounting that route.

4. It is already noted that much of the Capex information accessed and available is historic. In some instances, the timelines date back approximately 10-years. An adjustment is noted using PPI (via Stats NZ) and exchange rate settings, both of which seem appropriate. This would be further supported by consideration of scale economies and a growing competitive market in this field. For example, the business case fundamentals that may have been considered by Auckland Council around 2016 for an AD organics processing plant of the size and scale covered by this proposal would likely have been approximately NZ\$30-million to \$35-million based on international convention at the time of assessment. The resulting plant, commissioned in 2022 in Reparoa, has a stated build cost of \$30-million with site establishment costs of around \$6-million.

The point here is that there appears to be little in the way of inflationary impact over the past seven or eight years.

SPECIFIC TECHNOLOGIES – CAPEX IMPACT

1. Vermicomposting

Unless extensive green waste sources are factored into Council's collection and processing plans, including an aggressive competition strategy with the private sector collectors and processors, this option should be noted as is and discounted. Spending additional time and resources in second-guessing a highly agriculturally-orientated process where the base costs and considerations are unknown, even on an international scale, would appear to be pointless.

2. Aerated Static Pile Composting & Windrow Composting

These two options have been considered jointly, based on their historical use in green waste treatment and the agricultural application of their end products. The consideration of Councils' strategic intent in the assessment of these as viable methods, rather than convenient methods for business case comparison, needs to be better understood.

Commentary relating to strategic alignment apply to the consideration of Aerated Static Pile Composting and Windrow Composting. Typically these are favoured largely for green waste treatment and where extensive land requirements are not a constraint. To be considered viable, the location for a facility using this technology, if it could be considered technology, would be rural to remote-rural.

Little consideration has been provided through this preliminary investigation as to the resulting end-use or application of end product. If the determined market is agricultural compost, a facility proximate to that end market would be logical.

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For that assessment, the commercial considerations to be factored would likely include the following costs:

- a) Gate Rate for Commercial Composting of food waste only: \$80 - \$85/mt subject to strict contamination levels (typically less than 2%)
- b) Gate Rate for Commercial Composting of green waste only: \$45-\$50/mt.
- c) Cartage of food waste only from metropolitan to rural processing: \$55/mt covering contracts of, say, 3,500mtpa.

Aerated Static Pile:

On the costings above, the indicative gate rate noted for Aerated Static Pile Composting of approximately \$95/mt is more indicative of a commercial and contracted facility rather than one controlled by Council as it includes the realisation of the value of the land component. It is therefore a valid rate to consider, even for Councils.

The indicative capex range provided for Aerated Static Pile Composting provides two examples at varying ends of the volume spectrum.

Councils are considering a 50,000tpa facility.

While noting the cost of 365tpa mini-service, at \$20-million along with the rationale for its high value relative to output, this throws an unnecessary skew in the assessment process and provides no value to the capex estimate of the facility on a larger scale.

A better, but still not comparable, example is the 5,200mtpa unit at US\$2.3-million.

However, the indicative capex assessment has been an arbitrary multiplication of the scale up from 5,200mtpa to 50,000mtpa, suggesting a total capex in the range of \$50-55-million.

This source data is close to 30-years old and provides no mention as to the value of land, if at all factored.

Again, Councils' combined strategic intent may more formally deal with likely outdated considerations such as this.

Windrow Composting:

The consideration of a 365mtpa facility at \$22.2million capex carries the same concerns noted as the same facility size in Aerated Static Pile. The multiplier is based on a consistent tonnage factor, which may be correct, but provides an unnecessary skew to the other examples provided.

The 2010 Environment Bay of Plenty cost of \$11.5-million for a 60,000mtpa facility is likely to be the more accurate of the estimates, but fails to answer the following:

- a) The proportion of green waste to food waste, noting that this facility was intended to deal with the regions “organic waste”.
- b) The limitations imposed on Envirofert as to the amount of household food waste they are able to receive and process. For example, while they have been dealing with outdated Fonterra packaged product, this is primarily dairy based.
- c) The focus of EarthCare as a resource provider due to the high-reliance they have on their independent green waste operations.
- d) The intention of Lowe Corporation as a meat and rendering operator and the statutory or regulatory requirements needed to satisfy the processing of that type of input in a composting environment.

In summary, it could be suggested that the capex costs for Windrow Composting would need to be increased in the order of \$5-10-million to deal with segregation, compliance and regulatory factors alone in the move from a green waste dominated input to a blend of green and food waste.

From background research, it is understood that, at present, open air windrow composting of food scraps is not explicitly prohibited in NZ.

However, where food waste is incorporated, even in limited quantities, the potential for local impacts such as increasing odour complaints, vermin and leachate production may become significant and result in restrictions as to the use of this methodology.

3. In-Vessel Composting (IVC)

The comments in relation to Envirofert, EarthCare and Lowe Corporation (Windrow Composting) apply to the cost estimates using IVC in that a high proportion of green waste to food waste is likely to be the determining factor in either location or processing option.

The cost indications provided in the draft business case show little consistency in terms of scale or volume.

IVC is more technologically complex than Windrow Composting but provides a number of benefits including applicability to mixed food and green waste streams; shorter processing and retention times; smaller establishment footprint, including establishment in urban areas.

The capex cost estimate is noted as being between \$30-60-million for a 50,000mtpa facility. Again, this range includes the smaller zoo-application, and several larger, but not comparable, examples.

While of a smaller scale, the relocation of the Christchurch IVC plant would represent the closer cost comparison to the proposed facility in question.

Factoring decommissioning costs and adjusting for land acquisition and site establishment, the \$70-million estimate for this project would provide the most relevant comparison in terms of a 50,000mtpa operation.

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4. Anaerobic Digestion (AD)

Previous comments relative to EarthCare, Envirofert and Lowe Corporation apply to the cost estimates used as a comparison with AD as a selected technology also.

What this estimate does provide, though, is a relatively close comparison of an AD plant recently commissioned.

This First Gas Group / Eco Gas project is likely to use similar inputs and ratios as the materials likely factored by this business case, although still to be confirmed?

We would suggest that the capex range of \$25-\$35million is too extreme, given the points noted above, and a closer estimate for establishment alone would be in the order of \$35-million.

PROCESSING SUMMARY

The consideration of all cost inputs is critical. For example, the consequential opex covering the collection of 2.5kg/week from individual households in purpose designed containers and collection vehicles, is not comparable to an on-site, zero collection cost environment at, say, 1,500kg/day.

The purpose of providing comparisons and comparatives, even during early business case development, is to be able to prove or disprove best case options and where these align with stated intent already.

With the lack of New Zealand based examples to date, and where there are examples this is largely held as commercially sensitive due to private sector investment, it can be accepted that an estimate based on overseas history is possible but only where that experience is recent.

The following is a suggested summary of capex cost for investment options for a 50,000mtpa organics facility.

SUMMARY OF CAPEX COSTS:

	Capacity	CAPEX
Vermicomposting		n/a
Aerated Static Pile	50,000mtpa	\$55-million
Windrow Composting	50,000mtpa	\$20-million
In Vessel Composting	50,000mtpa	\$70-million
Anaerobic Digestion	50,000mtpa	\$35-million

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GATE FEES & RATES

Indicative commercial rates anticipated for the cartage and treatment of both green waste and food waste follow, and these have been noted earlier.

Gate Rate for Commercial Composting of food waste only: \$80 - \$85/mt subject to strict contamination levels (typically less than 2%). Also note that this is subject to limitations of quantity due to resource consent constraints.

Gate Rate for Commercial Composting of green waste only (no food): \$45-\$50/mt. This does not include transport or cartage rates.

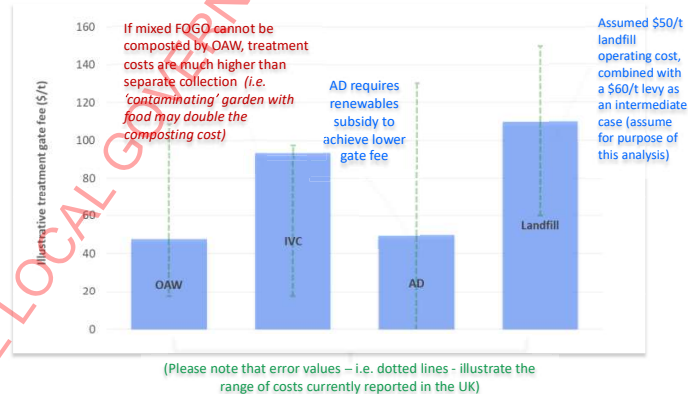
Cartage of food waste only from metropolitan to rural processing site: \$55-60/mt covering contracts of, say, 3,500 – 5,000mtpa. With transport cost the impact of scaling is relatively straightforward unlike processing options.

The following example of gate rates under four treatment options is based on United Kingdom costs, converted to New Zealand dollars. Please note that this is based on 2017 data.

This is provided strictly as a comparison only to highlight the differential between traditional composting methods and high-tech options such as IVC and AD.

The AD option includes a UK subsidy, and in New Zealand would need to factor the beneficial outcomes of energy sales over base rural compost rates.

- Illustrative treatment gate fees for the purpose of scenario modelling:



Source: SLR Presentation, WasteMINZ Conference 2017

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At a theoretical level we may decide that operating costs are different to gate rates. However, through an investment analysis it is imperative that the total costs of a venture are transparent, and factored. Especially where the opex consequence is used to determine targeted rating components.

Items such as the treatment of depreciation; the cost and consequence of land acquisition or use; the variability in costs to source raw materials; the consequence of processing factors such as the use of Bulking Agents etc are all relevant and relative to the assessment of options of any investment.

Likewise, the anticipated return for any output of a processing technology should be realistically assessed. For example, it would seem unlikely for Councils to factor the sale of a rural compost output at anything over break-even given the volatile nature of that commodity and the high level of competition already present in that market.

Energy outputs, however, have a greater degree of marketability and cost transferability, even at times of low pricing, there is likely to be a degree of net return to the seller.

This is to be informed by the overarching strategy around the treatment of the organics waste stream

Proposed indicative tonnage Gate Rates assumed for food waste predominate waste stream and inclusive of the costs associated with land:

	Business Case Summary	Business Case Figure 3.1	Proposed Review
Vermicomposting	\$53-\$110	\$40-\$80	n/a
Aerated Static Pile	\$80-\$110	\$70	\$100
Windrow Composting	\$66-\$110	\$50-\$80	\$85
In Vessel Composting	\$80-\$120	\$60-\$90	\$180
Anaerobic Digestion	\$120-\$270	\$90-\$200	\$150

The product mix is a critical component of the gate rate assessment across these processes, notably the impact of green waste in the stream which is a required bulker for a number of these processes.

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IMPACT OF COLLECTION COSTS AS CONSEQUENTIAL OPEX

Collection costs are highly dependent on local specifics – for instance urban vs. rural, housing type, collection method (e.g. dedication vs. collection with recyclables).

Demonstrated below by the spread in data for UK, converted to NZ\$ (with relatively few organic schemes in place in NZ, an equivalent NZ dataset does not yet exist):

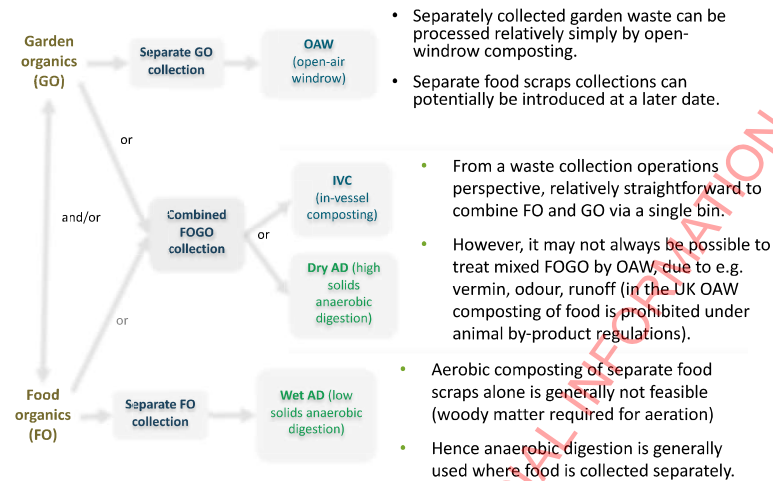


Source:
SLR

Presentation, WasteMINZ Conference 2017

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TO INFORM A PROCESSING STRATEGY



Source: SLR Presentation, WasteMINZ Conference 2017

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Climate Change and Sustainability Committee

31 October 2023

Report no: CCASC2023/5/345

Update on solid waste and waste minimisation matters

Purpose of Report

1. To provide the Committee with an update on various solid waste management and minimisation matters.

Recommendation

That the Committee notes the update on various solid waste management and minimisation matters.

Background

2. This report consolidates information on the status of Council's solid waste management and minimisation initiatives.
3. Detailed and regular information on the ongoing development, operation and performance of the Silverstream Landfill is covered in a separate report to the Hutt Valley Services Committee. The latest report from September 2023 is [available online](#) (page 14).

Wellington Region Waste Management and Minimisation Plan (WMMP)

4. In 2022, Council agreed to review the 2017-23 WMMP. As the work is done in collaboration with other territorial authorities (TAs) in the Wellington region, progress on this work is reported via the Wellington Region Waste Management and Minimisation Joint Committee (the Joint Committee).
5. The draft WMMP was approved for public consultation by the Joint Committee on 24 July 2023. Wellington City Council, as the host of the Joint Committee conducts the formal consultation process. Public consultation was open between 31 July and 1 September 2023.

6. On 18 September 2023, the Joint Committee met to hear oral submissions, providing an opportunity for public input. Minutes of the meeting [are available online](#).
7. As part of the process, a consultation delivery team (CDT) was created with officers from each council. They have worked on the summary of submissions to incorporate feedback into the revised draft plan.
8. A Joint Committee workshop was held on 30 October 2023 to work through the proposed revisions to the draft plan, and a further briefing time has been set aside for 13 November 2023.
9. The revised plan is scheduled to be considered by the Joint Committee on 4 December 2023, which will make recommendations for all Councils to adopt the WMMP. Approval from Hutt City Council will be sought at its meeting scheduled for 12 December 2023.
10. Please refer to Appendix 1 attached to the report for the latest draft of the WMMP, including the Hutt City Action Plan.

Resource recovery changes at Silverstream transfer station

11. The project to construct a new resource recovery shelter for Earthlink is nearing completion with the containers now installed in position on their screw piles – see image below.



12. Officers hope to be able to complete the decking and accessways prior to the roof being in position so Earthlink can continue its work at the landfill as soon as possible.
13. Note that there have been a number of unexpected delays due to the position of the container structure at the site. The site was chosen to optimise ease of diversion for landfill customers. However, the lack of level and stable ground has created a number of issues, and this means the final completion will not be until the end of November 2023.

Diversion of construction and demolition waste

14. Discussions with Waste Management on the collection and diversion of some construction and demolition (C&D) wastes, such as treated timber and plasterboard, continue. The central issue is identifying an alternative use within the region for this material. The waste minimisation team is investigating a number of existing projects around the country to assess what could be emulated in the Wellington region for sorted waste of these types.
15. However, once Porirua City Council (PCC) establishes its planned C&D processing facility, some of the C&D waste to be collected at Silverstream could be diverted there.
16. Porirua City Council (PCC) is on track to establish a mixed C&D waste processing facility at Spicer Landfill. PCC is in the final stages of procurement for the operating contract and will purchase the sorting plant early next year. Current expectations are that the facility will be commissioned mid-2024 and begin receiving mixed C&D waste for sorting by early 2025.

Diversion of tyres

17. The Tyrewise product stewardship scheme for tyres comes into force in 2024, with further details available at <https://www.tyrewise.co.nz/>.
18. This is Aotearoa's first regulated product stewardship scheme and a herald of things to come for other products as we move towards a more circular economy. The scheme was designed by industry with support from government. Tyrewise will enable the nationwide resource recovery of end-of-life tyres in New Zealand to ensure this resource is not wasted, but rather creates economic and social benefits.
19. Officers are looking into how we can support this initiative as much as possible by facilitating the collection of tyres and diverting them from landfill. We currently landfill over 10 tonnes of tyres per month and hope to see that decrease substantially once the scheme is in full swing.

Kerbside Rubbish, Recycling and Green Waste bin service

City-wide recycling contamination and behaviour change

20. Following a gradual downward trend over the last year, the recycling contamination rates appear to have plateaued at about 15%, albeit with significant fluctuations each month. Contamination rates for July and August are at 14.1% and 16%, respectively, with September at 14.3%. To address these fluctuating contamination rates, various initiatives are underway.
21. We have contracted Morrison Low to complete an independent review of the scoop-testing methodology, to ensure the testing methodology works as intended to identify city-wide contamination rates. Additionally, we are

actively conducting in-person, on-site scoop test assessments at the recycling plant.

22. Informative flyers are being distributed in areas with the highest contamination rates as part of an educational outreach effort.
23. Officers have also engaged VMLY&R (the agency) to carry out phase two of the contamination behaviour change campaign. The initial focus will be on reducing contamination over the Christmas/New Year period. The agency will explore all channels to ensure that we reach all residents of Lower Hutt.
24. The bin removal scheme (for households with repeated contamination instances) has led to the removal of about 170 recycling bins since its implementation in November 2022. Officers and Waste Management NZ have also begun discussing possible improvements to the scheme to further lower contamination rates as part of the phase two campaign.



25. The 'Too Good to Waste' recycling booklet is currently being revised to provide more relevant content in an engaging manner. As part of the distribution of the 2024 recycling calendar, we intend to supply all households with the revised booklet, to ensure all households have all the relevant information to recycle right and to minimise their waste where possible.

Potential campaign to reduce litter and illegal dumping behaviour

26. Officers are scoping out a potential city-wide anti-litter and illegal dumping campaign that could consist of multiple projects running in parallel. A key aspect of this project is also to improve the data we collect regarding litter and illegal dumping.
27. Note that Sustainable Coastlines is running another Petone Beach Cleanup event that will take place on 28 October 2023 (weather-dependent). This will

see an increase in promotion on Council platforms and will be attended by council officers to show ongoing support for this important work.

Climate Change Impact and Considerations

28. The matters addressed in this report have been considered in accordance with the process set out in Council's Climate Change Considerations Guide.
29. Minimising waste, diverting recyclables from landfill and recovering reusable materials (such as the potential addition of C&D diversion opportunities, diverting biosolids, etc) contribute to a more circular economy. These activities reduce the need to extract further resources from the environment and the associated energy use in doing so.

Consultation

30. Not applicable

Legal Considerations

31. Not applicable

Financial Considerations

32. There are no current financial considerations in terms of decisions for Council, however the following items have potential financial impacts in the future:
 - a. Improvements to the Silverstream transfer station (e.g. Earthlink resource recovery drop off, potential addition of C&D diversion opportunities) and participation in the Tyrewise scheme have the potential to divert an increased amount of material from the Silverstream landfill. A reduction in waste to landfill involves a short-term decrease in landfill revenue to Council but a long-term reduction in capital expenditure due to extending the capacity and life of the landfill.
 - b. Reducing kerbside recycling contamination has a direct benefit on the cost under contract for this service as any contamination rates under 10% do not incur penalty fees for Council.
 - c. Reducing illegal dumping and littering would reduce the cost to Council to collect and dispose of this waste.

Appendices

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Director Environment and Sustainability



WELLINGTON REGION WASTE MANAGEMENT & MINIMISATION PLAN 2023-2029

PREPARED FOR
THE COUNCILS OF
THE WELLINGTON
REGION

Absolutely Positively
Wellington City Council
Me Hoko Ki Pōneke

Te Kaitiaki-o-Roha o Taratahi
CARTERTON
DISTRICT COUNCIL

HUTT CITY
TE AHO KAIRANGI

Kapiti Coast
DISTRICT COUNCIL
He Hahi Whakamuri, Ka Tāro Whakamuri

Masterton
DISTRICT COUNCIL

porirua city

SOUTH WAIRARAPA
DISTRICT COUNCIL
Kia Beroatahi Tūhau

Te Kaunihara o
Te Awa Kairangi ki Uta
Upper Hutt City Council

LESS WASTE
GREATER PLACE

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1 Whakarāpopototanga | Executive summary

The eight Councils of the Wellington region have come together to develop a Waste Management and Minimisation Plan (WMMP) that sets a vision, objectives, targets, and action plans, for achieving efficient and effective waste management and minimisation across the region over the next six years (2023-2029). This is the third joint WMMP that the Councils have developed, which enables a more efficient and consistent approach to our waste management infrastructure, services, and activities to increase reuse, recovery, repurposing and recycling of waste. This WMMP outlines how the eight Councils, mana whenua, community, industry, and businesses can work together to transform how waste is generated, managed, and minimised in the Wellington region. Reflecting this collaboration is the vision for this WMMP, which is:

Te mahi tahi hei whakaiti para - mā te tangata, mā te taiao, me te ōhanga.

Working together to minimise waste – for people, environment, and economy.

This WMMP addresses the key issues identified in the Wellington Region Waste Assessment 2023, which, at a high-level, has identified that our modern 'take-make-dispose' economy is not sustainable. We need to start moving towards a circular economy, where we keep resources in use for as long as possible. Then, where possible, recover products and materials and regenerate natural systems at the end of a product's lifecycle. This approach aligns with Aotearoa New Zealand's *Te rautaki para | Waste strategy* and Aotearoa New Zealand's first emissions reduction plan - *Te hau mārohi ki anamata | Towards a productive, sustainable and inclusive economy*.

The Councils are committed to making this transition equitable and inclusive, recognising unique perspectives, and ensuring the costs, benefits and opportunities are distributed fairly. Mana whenua are also recognised as partners in the implementation of this WMMP. By minimising waste and valuing natural resources, the Councils are in alignment with mana whenua and their role to exercise kaitiakitanga for te taiao for current and future generations.

This joint WMMP addresses the identified issues by establishing the following objectives:

Whāinga 1	Mā ngā pūnaha para me te taumanu rawa e tautoko he whakaititanga o te tuku haurehu kati mahana mai i ngā ruapara me ngā kohikohinga para.
Objective 1	Waste and resource recovery systems support a reduction in greenhouse gas emissions from landfills and waste collections.
Whāinga 2	Translation to be updated
Objective 2	There is collective responsibility within the Wellington region for reducing our resource use and protecting our natural environment.
Whāinga 3	Translation to be updated
Objective 3	The conditions are in place to encourage everyone to use fewer resources and minimise waste
Whāinga 4	Translation to be updated
Objective 4	Material circularity is increased through reuse, resource recovery, and waste infrastructure and services.
Whāinga 5	Translation to be updated
Objective 5	It is accessible and convenient to reduce waste, reuse materials, and minimise disposal to landfill in line with the waste hierarchy.

Whāinga 6	Translation to be updated
Objective 6	Waste and resource recovery data systems are in place to track and monitor waste streams.
Whāinga 7	Translation to be updated
Objective 7	Resource recovery facilities and waste systems are resilient and able to cope with emergency events.
Whāinga 8	Translation to be updated
Objective 8	Recovery of materials is maximised so that landfills are used as a last resort.
Whāinga 9	Translation to be updated
Objective 9	Waste that cannot be prevented or diverted from landfill is managed safely and effectively in accordance with best practice.

1. The ambitious targets within this WMMP provide a clear and measurable way to track the region's progress towards the objectives and promote accountability. Reduce the total amount of material that needs final disposal to landfill by:

- 10% by 2027.
- 30% by 2030.

We will work towards this by achieving the following sub-targets:

- a. Ensuring construction and demolition processing and recovery is available in the Wellington region by 2026.
 - b. Ensuring a regional organics processing facility or facilities are available by 2029.
 - c. Ensuring five new resource recovery locations are added to the existing network within the Wellington region by 2030.
2. Reduce emissions from biogenic methane by reducing the total amount of organic waste disposed to landfill by 50% by 2030.
 3. Reduce emissions from the transport of waste by 50% by 2030.
 4. Ensure all urban households have access to kerbside recycling collections by 2027.
 5. Ensure food scraps collection services are available to urban households by 2030.
 6. For each Council to engage with and support 50% of the business community to minimising waste and implement waste minimisation activities.

A Regional Action Plan and Local Actions Plans have been developed to identify how these objectives and targets will be met. The actions are grouped within the priority areas below according to their impact on te pūnaha whakarōpū para | the waste hierarchy.

- Providing and supporting education initiatives within the Wellington region that focus on waste minimisation and responsible consumption.
- Supporting new and existing regional and local waste minimisation initiatives.
- Improving the way we connect and collaborate across the region on waste management and minimisation initiatives.
- Ensuring appropriate kerbside services are in place for recycling and organic waste.
- Ensuring appropriate regional infrastructure is in place to meet our targets and objectives.

- Investigating ways to effectively manage and monitor cross boundary and inter-regional waste flows.
- Investigating options for future disposal of residual waste and what this may look like in the long term.

Most importantly, while Councils play an important role in managing and minimising waste, we cannot do it alone. This WMMP aims to promote a collaborative approach across Councils, central government, communities, mana whenua, industry, and businesses who are all important in transitioning to a low-emission, circular and low-waste economy.

2 Kōrero Whakataki | Introduction

Waste management and minimisation is a critical issue in the Wellington region, and across Aotearoa New Zealand as a whole. The way New Zealanders currently consume products, based on a linear 'take-make-dispose' system, leads to large quantities of waste, where resources are not valued. It is also widely recognised that this current linear system, based on the extraction of virgin materials, exponential growth, and overconsumption of natural resources, is a significant contributor to greenhouse gas emissions and environmental degradation.

This WMMP still has waste reduction as a key focus, but it also begins the shift required for the Wellington region to move towards a circular economy, where we keep resources in use for as long as possible. From there, where possible, recover and recirculate products and materials, to support the regeneration of natural systems.

This joint WMMP addresses the key issues identified in the Wellington Region Waste Assessment 2023 (WRWA) and aligns with Aotearoa New Zealand's *Te rautaki para | Waste strategy*, which provides a high-level road map for the nation to shift to a low-emissions, low-waste society built upon a circular economy by 2050.

To support this change, this WMMP acknowledges that everyone can play a role to protect and enhance the environment within the Wellington region. By addressing our waste, steps can be taken to reduce the impacts of climate change, put in place actions to support designing out waste and pollution, keep resources in use for as long as possible, and safely manage the waste that cannot be diverted.

To help achieve this, this WMMP establishes a vision, a list of objectives, a set of targets, and a suite of regional and local council actions that provide a plan for waste transformation in the region. It outlines how the eight Councils, mana whenua, community, industry, and businesses can work together to transform how waste is generated, managed, and minimised in the Wellington region.

2.1 Transitioning to a low-emissions future

Aotearoa New Zealand's first emissions reduction plan - *Te hau mārohi ki anamata | Towards a productive, sustainable and inclusive economy* – was launched in 2022, and waste was identified as having an important role in meeting the 2030 and 2050 emission reduction targets.

While waste was reported as being responsible for 4% of Aotearoa New Zealand's gross emissions in 2021, 94% of those emissions were from biogenic methane – a potent greenhouse gas¹ with a warming effect 28 times greater than carbon dioxide². This greenhouse gas is generated by organic waste like paper, food scraps and garden waste that breaks down in landfills without oxygen, producing biogenic methane.

Many of our landfills currently accept organic waste and an opportunity exists for councils to develop and implement strategies to reduce organic waste disposal to landfill. This WMMP identifies organic waste management as a key focus area and as such has included a specific target (see Section 4.4 for further detail) for the Wellington region to strive towards reducing organic waste disposal to landfill.

Further, national legislative and regulatory changes are signalling a push towards a circular economy (refer to **Figure 1**) and a drive to heavily reduce carbon emissions. A circular economy means redesigning products and services to reduce resource usage, keeping resources in use for as long as possible, and recycling or processing them when they reach the end of their life to reduce waste and support the

¹ New Zealand's Greenhouse Gas Inventory 1990–2021 snapshot – Ministry of Business, Innovation and Employment (2023)

² Measuring emissions: A guide for organisations - Ministry for the Environment (2023)

regeneration of nature. To provide the Wellington region with an ambitious plan to steer this transition, this WMMP has been developed with the need to transition to a circular economy front of mind. As a result, it has sought to integrate all components of the plan, including objectives, targets, and actions to guide that transition.

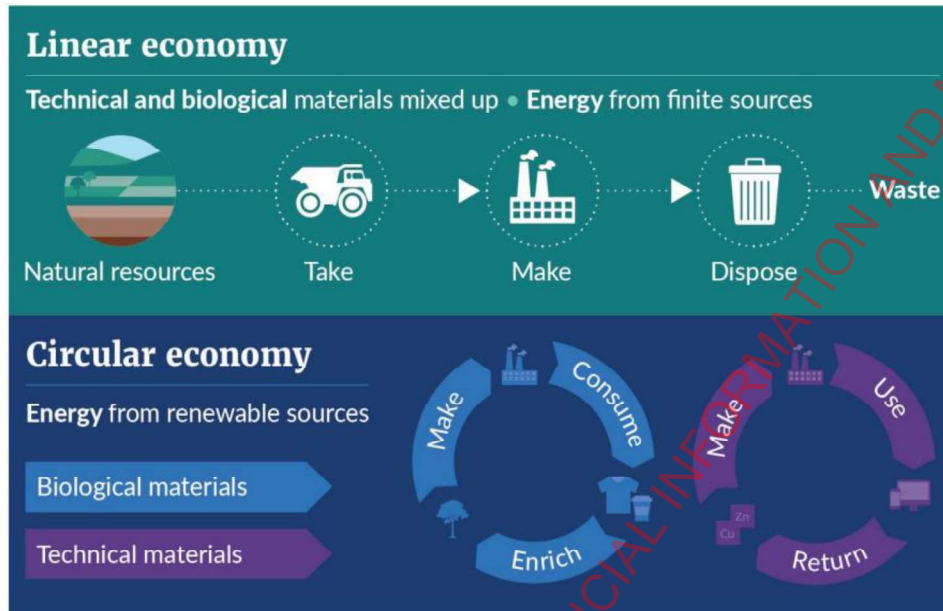


Figure 1: Characteristics of linear and circular economies (Source: Te rautaki para | Waste strategy)

2.2 Moving up the waste hierarchy to a circular economy

Notwithstanding the region's transition to a low emissions future, *Te pūnaha whakarōpū para | the waste hierarchy* (refer to **Figure 2** below) illustrates the most and least favoured methods to manage and minimise waste. The Ministry for the Environment defines the top two levels of the hierarchy as:

1. **Reduce, rethink, redesign:** Reducing the resources being used and redesign to avoid producing waste.
2. **Reuse, repair, repurpose:** Keeping things in use for as long as possible, without significant processing.

The top two levels of the waste hierarchy are key to changing the Wellington region from a linear economy (where we take, make and then dispose of products) to a circular one. A circular economy is one where waste and pollution are designed out, resources are highly valued and used for as long as possible, and where possible, products and materials are recovered at the end of their lifecycle.

While keeping materials at their highest value and prioritising the first two levels of *te pūnaha whakarōpū para | the waste hierarchy* is at the heart of this WMMP, the Councils also acknowledge the importance of continuing to support activities at all levels of the hierarchy to ensure the ongoing successful delivery of existing waste minimisation and management activities (e.g., kerbside collections and behaviour change initiatives).

By placing more emphasis on the top two levels of the waste hierarchy, the Wellington region has signalled a clear shift towards a circular economy. This shift will require protecting and regenerating natural systems, and ensuring that fair and inclusive outcomes are created for all communities.

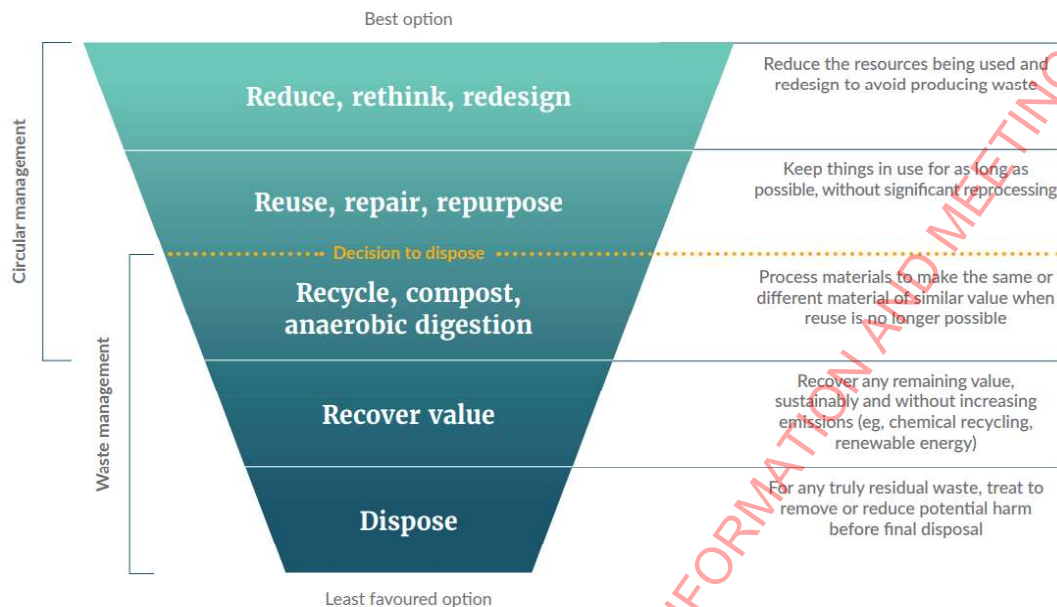


Figure 2: Te pūnaha whakarōpū para | The waste hierarchy (source: Ministry for the Environment, Te rautaki para | Waste strategy)

2.3 Why do we need a WMMP?

Section 43 of the Waste Minimisation Act 2008 (WMA) requires that territorial authorities adopt a Waste Management and Minimisation Plan (WMMP) to promote effective and efficient waste management and minimisation within their city or district³. Reviews of WMMPs must occur at least every six years.

For the eight councils in the Wellington region, this will be the third joint WMMP. The eight councils are:

- Carterton District Council
- Hutt City Council
- Kāpiti Coast District Council
- Masterton District Council
- Porirua City Council
- South Wairarapa District Council
- Upper Hutt City Council
- Wellington City Council

While the previous WMMP (2017-2023) had a heavy focus on becoming waste free, data from the WRWA suggests recycling performance is static or in decline in most Wellington region cities/districts. With the population in the Wellington region expected to increase, the rate in which we are disposing of waste to landfill is unsustainable.

This WMMP covers all solid waste (including waste diverted via recycling, composting or otherwise) in the Wellington region, whether it is managed by Councils or not. Gas emitted from the three Class 1 landfills in

³ Section 43 of the WMA.

the Wellington region continue to be managed by the facility operators, with gas required to be captured according to the National Environmental Standard for Air Quality 2004.

While Councils may not have a direct involvement in the management of all waste, there is a responsibility for all Councils to at least consider the management of all waste. Councils also have responsibility to provide access to services such as to households, and to suggest areas where other groups, such as businesses, could take action themselves.

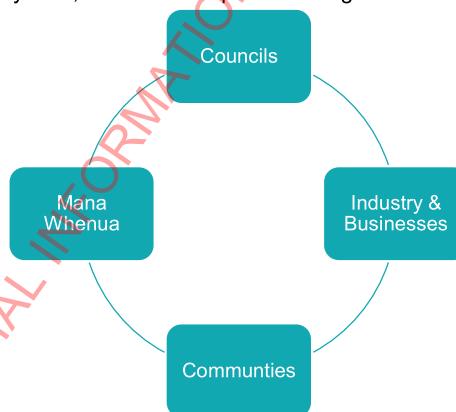
This WMMP covers the period from 2023 to 2029 but is intended to be relevant beyond 2030 as *Te rautaki para* | *Waste strategy* changes are established and embedded in at a national, regional, and local level⁴.

2.4 Who is impacted by this WMMP?

We all play a role in the waste management and minimisation system, whether as a producer of goods and services, consumer, or processor of waste. Therefore, everyone should familiarise themselves with this WMMP and consider their role and responsibilities within it.

Councils cannot achieve the vision, objectives, targets, or actions outlined in this WMMP alone. It will require joint effort, focus, and a willingness to change from everyone in our region.

The different roles and responsibilities of Councils, mana whenua, community, industry, and businesses are described in detail in section 5.1 of this WMMP, it includes details on how Councils may work in partnership with mana whenua and support other key stakeholders to implement this WMMP.



2.5 Recognition of Te Tiriti o Waitangi and Te ao Māori

We (the Councils) recognise mana whenua as integral to the implementation of this WMMP. This is not only because of our duty as partners under Te Tiriti o Waitangi but because mana whenua have a role in exercising kaitiakitanga (guardianship and protection) to ensure the environment is looked after to sustain current and future generations. As tangata whenua, mana whenua also possess unique perspectives, mātauranga Māori (indigenous knowledge), and tikanga (customs) that can collectively inform possible solutions for the Wellington region's waste management and minimisation issues.

In te ao Māori, traditional waste management practices are centred around sustainability and a circular, closed-loop system. There is a focus on not creating the waste in the first place, and cycles of continual regeneration of nature. This involves returning all resources back to Papatūānuku (the earth). This process intends to reduce harm to the land, waterways, and oceans.

Whakapapa (the kinship between all living things: past, present, and future) is also key in te ao Māori. Whakapapa not only exists between people but between people and the planet. By understanding the connection and responsibility between humans and living things, everyone can act more responsibly to ensure our actions create balance in the natural environment. Inherent in te ao Māori, is the need for everyone to:

- Recognise the value in natural resources and use them appropriately.
- Think about how things are connected and how our actions affect them.

⁴ Section 50 of the WMA

- Step up in our responsibility to care for nature, what it gives us, as well as people.
- Acknowledge that humans are an element of the environment and part of the overall system.

The work identified in this WMMP will be underpinned by the three commonly understood principles of Te Tiriti, which are:

- **Participation** – we will maximise opportunities for Māori to participate in decisions that affect them.
- **Protection** – we will support mana whenua to exercise kaitiakitanga of the environment and seek to ensure that the actions included in this WMMP achieve positive environmental, social, and economic outcomes for Māori.
- **Partnership** – we remain committed to developing meaningful relationships and partnerships with mana whenua and to collaborate on waste management and minimisation practices and activities important to them.

This means working with Māori, for Māori, in a way that respects rangatiratanga (the right for Māori to make decisions for Māori) and aligns with te ao Māori, mātauranga Māori and kaitiakitanga. Councils will also seek to partner with mana whenua so councils can align with a Māori worldview of waste minimisation. Councils recognise Māori have an in-depth knowledge of Aotearoa and the Wellington region environment, and we must work together to draw from whakaaro Māori and achieve waste minimisation aspirations for Māori.

To support this mahi, this WMMP includes a range of actions which seek to develop and strengthen partnerships between Councils and respective mana whenua within their rohe and explore ways of working collaboratively to achieve common goals.

2.6 An equitable transition

The way waste is managed and minimised has the potential to create broader benefits for people, the environment, and the economy. Impacts resulting from the transition to a low-emissions, low-waste system, built upon a circular economy, will be identified, and managed in a way that is fair and just across communities. The eight Councils are committed to the equitable and inclusive guiding principles as outlined in *Te rautaki para | Waste strategy* and Aotearoa New Zealand's first emissions reduction plan, *Te hau mārohi ki anamata | Towards a productive, sustainable and inclusive economy* including:

- Recognising the unique perspectives, needs and approaches facing different local communities, businesses, hapū, iwi and whānau.
- Ensuring the costs and benefits of change are distributed equitably among communities and across generations.
- Developing and investing to create opportunities and jobs in local and regional communities.

By identifying potential benefits and maximising opportunities brought about by this transition to a low waste, low emissions society, policies and actions can be tailored accordingly to ensure everyone in the Wellington region is supported through this period of change.

3 Te āhuetanga o nāiane | Existing situation

The WRWA provides an assessment of the current waste situation in the region and has been published alongside this WMMP. This section summarises the key findings from the WRWA, within the following broad groupings:

- the legislative context influencing waste activities and outcomes in the region (Section 3.1).
- an overview of the Wellington region, including topographical and geographical context, demography, and economy (Section 3.2).
- volumes of waste streams entering landfills (Section 3.3).
- existing infrastructure and future demand (Section 3.4).
- the key issues and challenges facing the region (Section 3.5).
- what's already working well in the region (Section 3.6).

The WRWA acknowledges that a key issue faced by the Councils in the development of this WMMP is the availability and accessibility of data, particularly on the activities of the private waste and diversion sector. This limitation affects the ability of this WMMP to accurately identify flows of materials and quantities of recovered materials across the Wellington region, which influences the framing of analysis presented below, but is a key focus of actions for this WMMP.

3.1 Policy drivers and legislative context

The overarching document for waste management in Aotearoa New Zealand is *Te rautaki para | Waste strategy*, which is the roadmap for the next three decades for a low-emissions, low-waste society built upon a circular economy. Alongside this strategy, various legislative and policy frameworks influence waste collection, recycling, recovery, treatment, and disposal services in Aotearoa New Zealand.

We have considered each of these in the preparation of this WMMP, with a particular focus on policies directing us towards a low-emissions, low-waste, circular economy. **Figure 3** illustrates this broad framework.

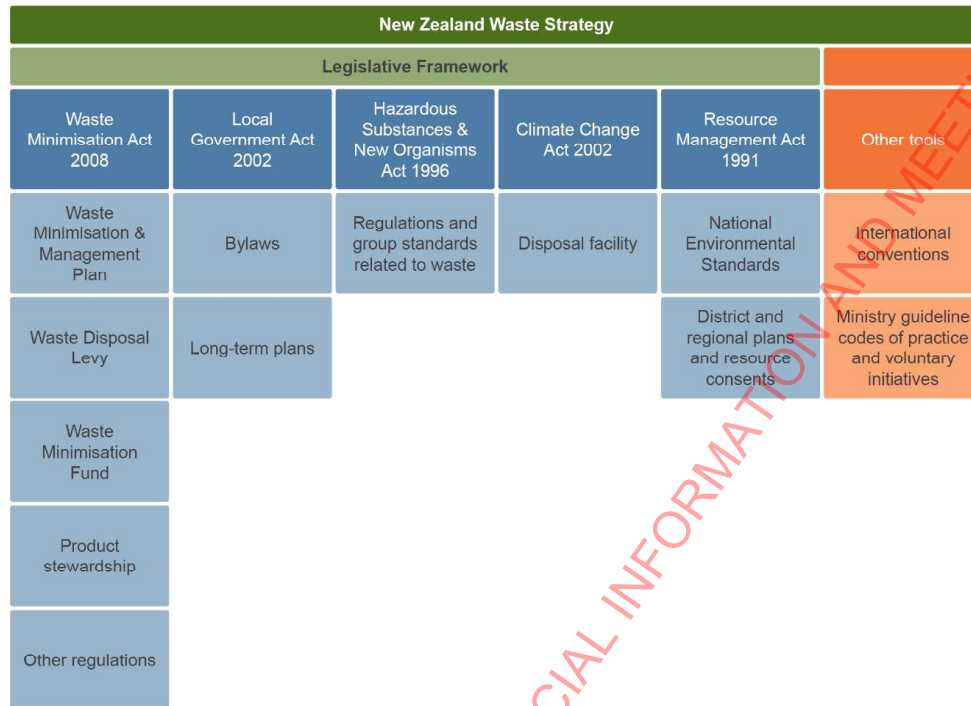


Figure 3: The strategic, legislative and policy frameworks that influence waste collection, recycling, recovery, treatment, and disposal services in Aotearoa New Zealand.

To achieve transformational change, as emphasised in *Te rautaki para* | *Waste strategy* and this WMMP, everyone including the Councils, mana whenua, community, industry and businesses need to get involved. For the Councils in the Wellington region, this includes:

- Building on *Te rautaki para* | *Waste strategy* to implement this WMMP, which will assist in developing an Action and Investment Plan that will provide a greater level of detail on what is needed to deliver on said *Waste strategy*.
- Exploring opportunities to work with other councils on new or expanded facilities and services, that will contribute to a national network for circular management of resources.
- Supporting local community groups and non-governmental organisations with their initiatives to reduce waste.
- Linking with national behaviour change programmes to support and expand the reach of local activity.
- Plan and resource the work needed to identify and manage landfills and other contaminated sites as part of a long-term regional waste management plan.

Each of these focus areas are included within the Regional Action Plan, as set out in Section 6.1 of this WMMP.

Councils will also need to give effect to any regulations that are currently or expected to be imposed by central government under the WMA. This includes the following:

- Providing household recycling and food scraps collections where they do not already exist, which are expected to be set out in regulations.
- Standardising materials and the minimum standards for diverting waste from landfill, which are expected to be set out in performance standards.
- Changing the reporting requirements to central government, which are expected to be set out in regulations.
- Considering collection services and infrastructure if a regulated product stewardship scheme is proposed for a product.

It's also important to note that Councils will need to adapt to future legislative changes as the Government are currently developing new and more comprehensive legislation on waste to replace the WMA and the Litter Act 1979⁵. The new combined legislation is intended to put in place the tools and arrangements that will deliver *Te rautaki para* | *Waste strategy* and ensure, as a country, that funds generated by the expanded waste disposal levy are put to good use. It is expected that the new legislation will reset the purposes and principles, governance arrangements, and roles and responsibilities in waste legislation to achieve waste reduction goals. The Ministry for the Environment expects the draft Bill to be introduced into Parliament by early 2024. These changes will provide additional tools for Councils to achieve the objectives of this WMMP.

⁵ <https://environment.govt.nz/what-government-is-doing/areas-of-work/waste/waste-legislation-reform/>

3.2 The Wellington region

Understanding topographical and geographical context, demography, and economic drivers in the region helps to provide context to the management of waste and resources. The Wellington region poses several unique topographic and geographic challenges and opportunities when it comes to managing and minimising waste. The region's topography creates physical barriers between different parts of the region, as well as connections to the rest of Aotearoa New Zealand, as it is flanked by the sea and the Remutaka and Tararua Ranges. This topography has shaped urban development patterns and resulted in two main north-south urban development and movement corridors with limited east-west connections.

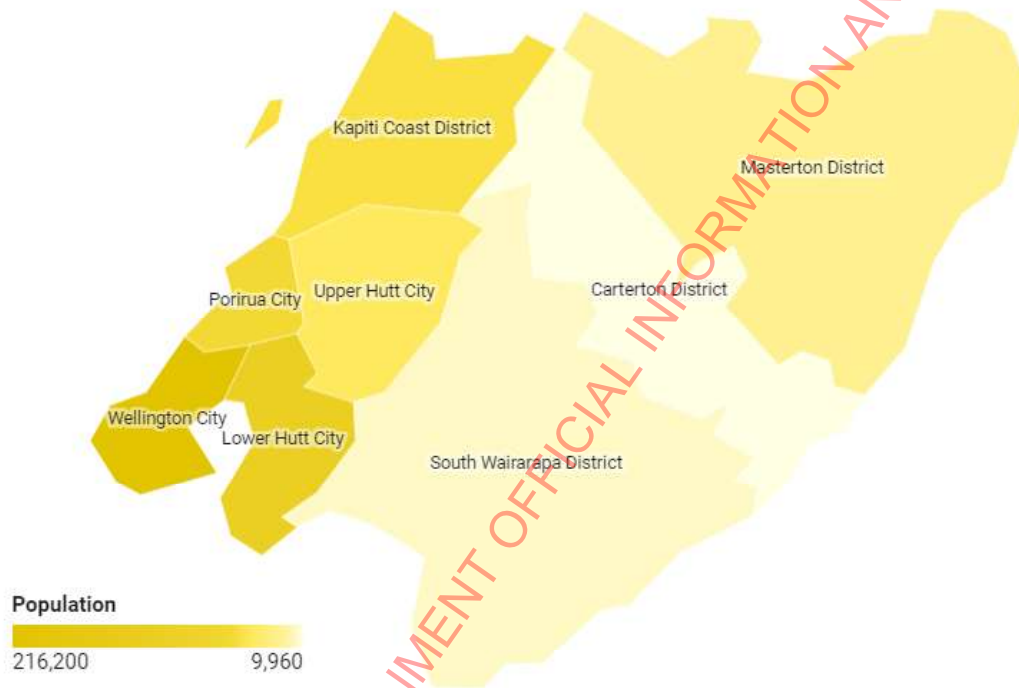


Figure 4: Wellington region illustrating the eight councils and their population⁶

The Wellington region includes the eight councils as illustrated in **Figure 4**. The region's population of nearly 550,000 people⁷ is concentrated in the larger metropolitan areas of Wellington city, Porirua, and Lower Hutt, with the remaining population dispersed to the north throughout the Hutt Valley and along the coastline to Kāpiti, and into the predominantly rural Wairarapa in the west. This results in an inflow of around 82,000 workers every weekday from other districts and cities into Wellington city⁸.

This urban development pattern and limited east-west transport connections create challenges for the movement of people and resources around the region. Particularly if a main north-south transport corridor (e.g., State Highway 1 or 2) is closed or disrupted. Resources need to move to, and through, the different areas of the region where people live, work and play. This includes producers and manufacturers, households and businesses, and the various recycling/reprocessing facilities in the region. This highlights how waste is truly a regional issue, and therefore why a regional approach is needed to minimise waste.

⁶ [Facts & Figures - WellingtonNZ.com](https://factsandfigures.wellingtonnz.com/)

⁷ <https://ecoprofile.infometrics.co.nz/Wellington-Region/Population>

⁸ <https://www.nzta.govt.nz/assets/resources/keeping-cities-moving/Wellington-regional-mode-shift-plans.pdf>

Socio-economic characteristics, such as age, ethnicity, and social deprivation levels vary within and across each of the Councils, therefore each council is likely to have unique vulnerabilities, challenges, and opportunities regarding waste management and minimisation initiatives. Socio-economic characteristics are also likely to change over time. Across the Wellington region, the population is projected to age, with a larger proportion of the population expected to be aged 65 or over⁹. Māori, Pacific and Asian people are also expected to make up a larger share of the region's population¹⁰. In addition, the cost of living for the average household increased 7.7% in the 12 months to March 2023. This trend of the upward cost of living is anticipated to continue, placing increasing economic pressure on households¹¹¹². These socio-economic shifts further highlight the need for this WMMP to support an equitable transition to a low-emissions and low waste society (refer to Section 2.6 above for more information about an equitable transition).

Of the key industries contributing to the production of goods and services (i.e., Gross Domestic Product (GDP)) within the Wellington region, the professional, scientific, and technical sector contributed the largest proportion (13.9%), followed by public administration and safety (12.5%)¹³ (Figure 5). Often, the industry share in the region has a direct influence on the type and volume of waste produced and available for management but this is not the case in the Wellington region.

Further, the volumes and types of waste being produced across the Wellington region and subsequently disposed of is anticipated to change as more emphasis on waste minimisation activities, reuse and repurposing initiatives become mainstream. For example, the two sectors which contribute to the largest proportion of GDP in the Wellington region do not have a corresponding waste stream which is the highest contributor to the waste composition in the region (such as materials common place in office-based roles e.g., paper, cardboard, food scraps). Instead, organic waste and construction and demolition (C&D) waste are the highest contributors to the waste composition in the region¹⁴ (as discussed further in Section 3.3 of this WMMP). Influencing factors include but are not limited to:

- commercialisation of innovative technologies.
- sustainable product design.
- a keener focus on mapping behaviour-change pathways.
- resource initiatives for waste reduction/recycling at both central and local government levels.

However, this change will require wider initiatives such as investment in waste and resource management infrastructure as well as supporting legislative instruments.

⁹ StatsNZ 2028 Population Projections (2018) baseline

¹⁰ StatsNZ 2028 Population Projections (2018) baseline

¹¹ <https://www.stats.govt.nz/news/cost-of-living-remains-high-for-all-household-groups/#:~:text=The%20cost%20of%20living%20for%20the%20average%20household%20increased%207.7,12%20months%20to%20December%202022.>

¹² <https://www.asb.co.nz/content/dam/asb/documents/reports/economic-note/asb-hh-cost-of%20living-update-2023.pdf?et rid=MzI2NTU2OTEyODY0S0&et cid=7054748>

¹³ <https://ecoprofile.infometrics.co.nz/Wellington%20Region/Gdp>

¹⁴ Wellington Region Waste Assessment 2023

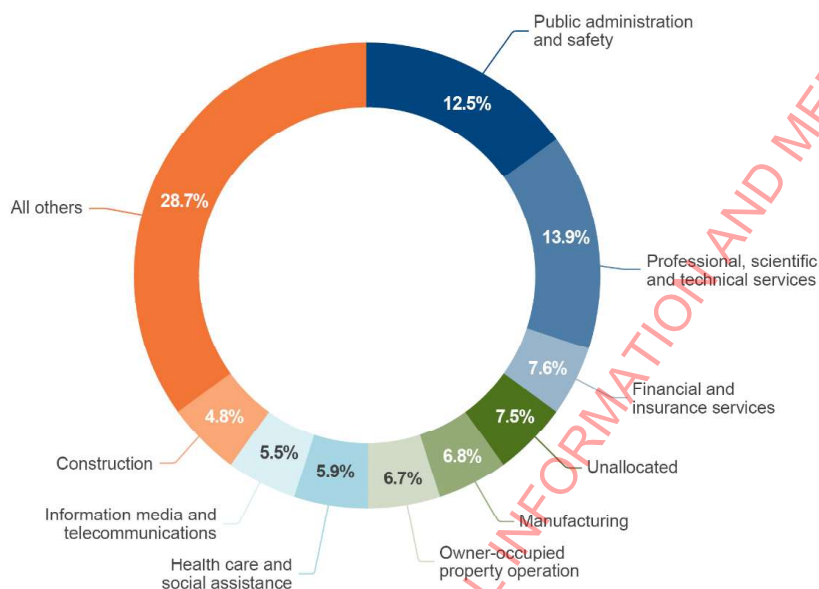


Figure 5: Proportion of Gross Domestic Product by Industry Type for the Wellington Region between 2001 and 2021

3.3 How much waste is there?

To understand the volume and type of waste produced in the Wellington region, we need access to reliable and transparent waste data. This data is essential to target activities that will reduce waste production and disposal. However, access to reliable and transparent data is an issue across Aotearoa New Zealand. While we have some waste data for the region from previous years, comparing it decade on decade, or even year on year, is difficult due to inconsistencies in data, reporting requirements and the lack of a national waste data framework. Improving both the quality and quantity of waste data is a core component of *Te rautaki para* | *Waste strategy*, and this WMMP acknowledges this. The WRWA also highlighted the difficulties and assumptions associated with available waste data.

Nevertheless, to plan for transformation we need to start somewhere. This requires us to review the data we do hold and understand how well our waste management and minimisation system is performing. This information is critical to setting an ambitious vision, clear objectives, tangible targets, and achievable actions for the next six years that will help us to address the issues and opportunities facing our region, and transform how we generate, manage, and minimise waste.

Of note, Aotearoa New Zealand is one of the highest generators of waste per person in the world. In 2018, we collectively sent 3.7 million tonnes of waste to Class 1 landfills (approximately 750 kgs per person). This is 49% higher than the Organisation for Economic Co-operation and Development (OECD) average of 538 kgs per person¹⁵.

¹⁵ Ministry for the Environment. 2021. *Te kawe i te haepapa para* | *Taking responsibility for our waste: Proposals for a new waste strategy; Issues and options for new waste legislation*. Wellington: Ministry for the Environment.

At a regional level¹⁶:



With reference to the above diagram, the difference between the two figures is likely due to other countries restricting the import of certain recyclables, primarily mixed paper, and mixed plastic. An example of this is China's "National Sword Policy", which limited the flow of contaminated recycling exports to China and has led to lower overall recycling rates and stockpiling of recyclable materials domestically with Aotearoa New Zealand and other Western countries around the world. However, the effect of this policy has also contributed to improvements in national waste infrastructure to, for example, sort materials. (e.g., optical sorters and Material Recovery Facilities).

The following graph summarises the primary composition of levied waste to Class 1 landfills in the Wellington region for 2021/22¹⁷ (Figure 6).

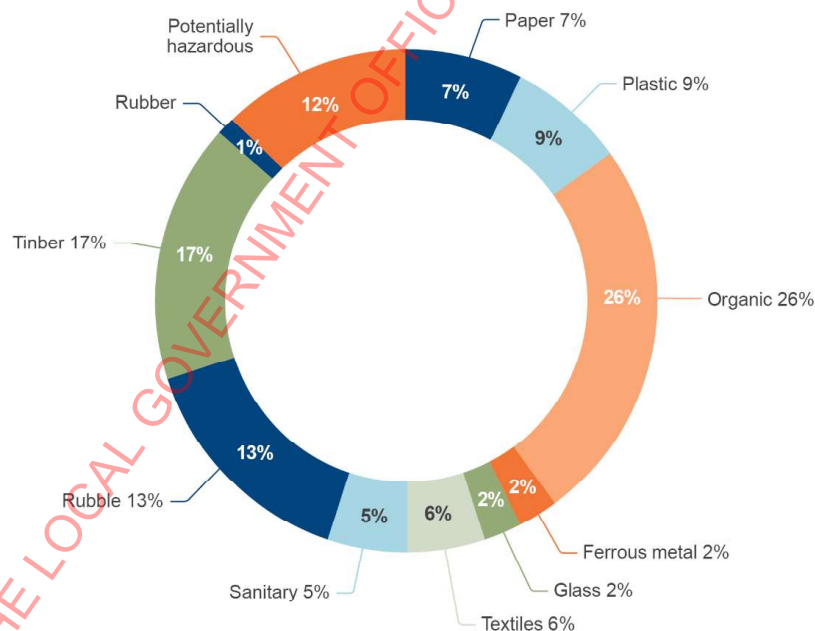


Figure 6: Composition of Levied Waste to Class 1 Landfills

¹⁶ Wellington Region Waste Assessment 2023

¹⁷ Wellington Region Waste Assessment 2023

As our data improves, we will continue to explore opportunities to improve our progress reporting against our WMMP targets. This reporting is expected to be supported by central government, who are developing an online platform where up-to-date, aggregate data is publicly available (as of September 2023).

As discussed in the WRWA, there is potential to divert as much as 57% of levied waste from landfill with the development of new material collection and treatment systems within the Wellington region. For waste streams such as organic waste, plastics and paper, the impacts of this diversion are expected to be significant and could lead to significant waste and emissions reduction potential (see **Figure 7** to the right).

For more detail on the assumptions and data used to generate these estimates, please refer to Section 5 and 6 of the WRWA.

3.4 What about the future?

The factors that will impact future demand for waste services are difficult to predict, particularly given that the changes signalled within *Te rautaki para | Waste strategy* will take time to become entrenched in our daily lives and may be influenced by changes in the government of the day. As such, this WMMP has been developed to provide a step change for the Wellington region under the current legislative conditions with flexibility built in to ensure the actions can continue in the event of governmental changes. However, it should be noted that where significant legislative changes are made, these may affect how the WMMP actions are developed and implemented (e.g., delivery timeframe).

In addition, for the Wellington region to move towards a low waste society, councils will, via the WMMP, investigate and where possible, work with organisations (e.g., community organisations and NGOs) and partners (i.e., mana whenua) to increase and further enhance reuse, repurposing and recovery activities.

To achieve this, Councils recognise the breadth and depth of skills and experience that are present across the region as well as the connections and relationships between organisations and partners. In recognition of this, and to support the implementation of the WMMP, Councils have indicated a desire to work more closely (e.g., procurement opportunities) with organisations and partners already working within the waste minimisation and management sector.

Notwithstanding the potential for legislative changes and the desire to work more closely with organisations and partners to deliver the WMMP,

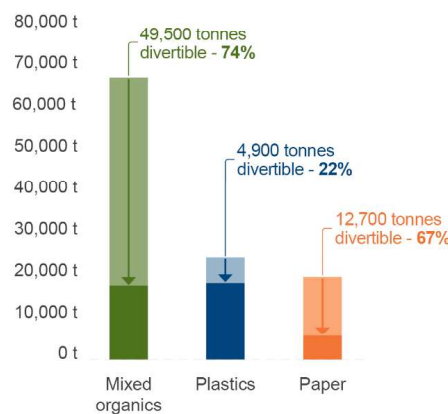


Figure 7: Diversion Potential of Levied Waste Streams to Class 1 Landfills

forecasting population growth within the Wellington region is an important step in understanding the likely demand on waste services into the future. The forecasted population¹⁸ for the Wellington region is expected to increase by about 42,000 people by 2030 and 180,000 people by 2054 and as such provides an indication of the likely investment required to support current and future waste infrastructure. This will ensure residents and ratepayers are provided with value for money, accessible, effective, and convenient services that support the region in diverting waste from landfills and moving up in the waste hierarchy.

¹⁸ [Population forecast 2020 to 2051 \(sensepartners.nz\)](https://www.sensepartners.nz/)

Further, this forecasted population growth is already reflected in construction activity in the region, with approximately 7% of the national number of dwellings under construction happening in the region¹⁹. This additional population could require up to 150,000 new homes across the region, with two thirds of this intensification within existing urban areas and one quarter in Wellington City. While it is noted that the highest growth areas are located in the three Wairarapa districts, with a growth rate of approximately 51% occurring, this increase is still coming off a relatively low population base. This means the overall proportion of a regional population dominated largely by urban city residents will remain.

The implications of this intensification (and dispersed growth in some areas) means that Councils will need to establish robust waste management and minimisation systems and processes that are accessible and convenient to residents and ratepayers.

In addition to population growth, we also continue to consume more. As a whole, Aotearoa New Zealand has increased the volume of waste generated per capita from 2012 to 2019, with a total increase of approximately 48% between 2010 and 2019²⁰. There was a slight decrease in volumes in 2019 and 2020, with the decrease in 2020 likely driven by COVID-19. However, the downward trend has not continued into 2021, and longer-term trends suggest the rate of disposal to landfill is increasing.

While current forecasts suggest the rate of disposal to landfill will only increase, two of the region's landfills have resource consents set to expire within the next ten years. The Southern Landfill, located in Wellington City and Spicer Landfill, located in Porirua will expire in 2026 and 2030, respectively. While there are plans to seek new resource consents for Southern Landfill, there are no guarantees these will be granted, which would severely limit future end-of-life disposal options in the region. This further emphasises the need to reduce the amount of waste generated and sent to landfill in the region.

In the medium to long-term, as the actions from the Regional and Local Action Plans within this WMMP are implemented, the region will be on track to see the amount of waste disposed to landfill reduce.

3.5 The challenges / issues we are facing

As highlighted in the WRWA, there are a number of existing barriers or challenges holding the Wellington region back from an orderly transition to a low-emissions, low-waste society. As part of this WMMP, we recognise that these challenges need to be proactively addressed in the objectives, targets and actions put forward by the Councils and will require collaboration with stakeholders and partners across the region. The following section summarises the key challenges and issues we are facing in the waste management and minimisation system in the Wellington region.

For an explanation of how these challenges are addressed in our action plans, please refer to Section 6 of this WMMP.

3.5.1 Weak pricing signals

Despite the increases to the waste disposal levy, disposal remains a cost-effective option for many businesses and industries. In many settings, the increases are simply incorporated into the cost of doing business. To achieve meaningful waste minimisation and to change ingrained disposal habits, alternate options must be accessible and convenient while also being competitive with disposal to landfill.

¹⁹ Wellington Region Waste Assessment 2023

²⁰ Waste reduction work programme. Wellington: Ministry for the Environment, August 2021.

3.5.2 Limited data

Limited data, particularly on the activities of the private/commercial waste and recycling sector, limits Councils' ability to effectively plan for and respond to future demand. It also creates issues with tracking and reporting on progress against targets.

Waste movements across the Wellington region pose a challenge for data, as waste is often generated in one district, then transferred and/or consolidated in another district, before being sorted at a Materials Recovery Facility (MRF) or disposed of in landfills. This includes materials disposed to class 2-4 landfills, where there are potentially high quantities of divertible/recoverable material that Councils may not have oversight over.

3.5.3 Recycling performance

The data available suggests that recycling performance is static or declining within the Wellington region. Kerbside recycling and drop-off waste tonnages for the Wellington region showed a decreasing trend during 2020/21 and 2021/22²¹. Contamination and low recycling knowledge are ongoing issues.

3.5.4 Low diversion of organics from landfill

Food waste, green waste, and biosolids represent a significant proportion of recoverable material being landfilled. While a reasonable fraction of garden waste is composted, there is very little diversion of food scraps. Additional recovery of food and garden waste from landfill is one of the biggest opportunities to improve diversion and reduce biogenic methane emissions from decomposing organic material. As such, cities around the world use legislation and bylaws to effect change which may require household's and businesses' recycling, composting and landfill to be separated. Some cities are also banning organics disposal to landfills with some including substantial fines for non-compliance. To support these changes, cities are providing waste collection options to households, drop-off locations, behaviour change programmes, home composting and community gardens that enable food waste diversion from landfill and help mitigate greenhouse gas emissions.

3.5.5 Barriers to working together regionally

While the Wellington region has delivered on several key projects, barriers to enhanced regional collaboration could be due to different councils having conflicting priorities at a regional and local level. Councils have traditionally been inward-focused, with each council responding primarily to the drivers within their area. However, where synergies align, collaboration has been sought to take learnings and minimise reworking initiatives. In addition to this, differing ownership of assets, service delivery expectations, and varying general rates or waste levy funding levels all create differing imperatives and the scale at which a challenge can be addressed.

It may also be difficult to design regional initiatives that create successful outcomes across all Council jurisdictions, as a regional approach often doesn't consider the nuances of each community makeup. For example, there are wide variances in population density within and across Councils, and a wide range of other differences across topography and demographics. The local inward-focused approach to waste management has resulted in a range of systems, many of which have evolved over time and are not necessarily configured to deliver optimum results in terms of cost and waste minimisation performance. There are likely to be gains from a more consistent, standardised approach that utilises best practice, while allowing for flexibility to address local differences. For example, a more consistent approach to kerbside services and transparency of the flow of materials.

²¹ Wellington Region Waste Assessment 2023

3.5.6 Increase in construction and demolition waste from urban development

Population growth, urban development, and an increasing densification of housing through multi-unit dwellings is contributing to the Construction and Demolition (C&D) waste stream, which includes a significant proportion of recoverable material. Up to 50% of NZ's waste to landfill comes from C&D²². The region's solid waste bylaws have allowed for Multi-Unit Development storage and collection provisions, and waste minimisation plans for construction above a certain value. The implementation status of these provisions varies between Councils.

The previous and current waste assessments are reporting the current low level of infrastructure available to recover construction and demolition materials, including timber, concrete, brick, and plasterboard.

3.5.7 Consumption habits

Embedded consumption habits are unlikely to change significantly in the near future. This points to the continued generation of higher quantities of waste per capita in Aotearoa New Zealand than the OECD average. Councils have limited control over the production and importation of products consumed within Aotearoa New Zealand, and minimal influence over the established markets and systems for linear consumption that result in waste generation.

3.5.8 Need for new infrastructure

Communities, and the businesses and organisations that serve them, need to implement circular economy practices to reduce waste. This shift necessitates significant investment in new infrastructure and new services, such as regional organic waste processing as well as building awareness of, and community engagement with existing services, to divert resources from landfill. Currently, there is a lack of infrastructure available locally, regionally, and nationally to implement circular practices for the majority of materials currently managed as waste.

3.5.9 Government legislation still in development

While *Te rautaki para | Waste strategy* has been released, some government policy and legislative changes in development will not come to fruition until after this WMMP is finalised, including the WMA and Litter Act 1979 reforms. As such, the region must develop and confirm its WMMP before the confirmed policy and legislative landscape is fully known.

3.5.10 Litter and illegal dumping

There is limited data available on the extent of litter and illegal dumping across the region, however it is a significant issue that negatively impacts our waterways, coastal environment, and urban areas. Increasing cost of living pressures can exacerbate the rate of illegal dumping, and the Litter Act 1979 only provides limited ability for infringing and enforcing penalties for those responsible.

3.5.11 Unforeseen events/waste resilience

Events (such as natural or human-made disasters, and pandemics) can result in high volumes of waste in a short period. Weather events are expected to become more commonplace as a result of climate change and may become cascading and compounding events that generate significant amounts of hazardous waste, including contaminated silt and sensitive debris.

Moreover, the COVID pandemic interfered with recycling collections as waste to landfill was prioritised, and workers on the front-line faced significant risks from handling waste during this outbreak.

²² Saving Construction Waste, Ministry for the Environment (2021)

3.6 What is working well in the Wellington region today?

While the WRWA highlighted many challenges and barriers for this WMMP to address, the previous WMMP delivered a number of meaningful initiatives that were received well by stakeholders across the region. Notably, the contribution of feedback given in the stakeholder engagement workshops held to inform the development of this WMMP, identified a number of successful initiatives and programmes underway in the Wellington region. These are characterised and explained in more detail below:

Collaboration between Councils and community organisations, industry and businesses

There are many community/volunteer organisations working to minimise waste and support circularity within the Wellington region, working cooperatively and/or with Councils (i.e., sharing knowledge and resources, and partnering on initiatives). Waste Free Welly is a great example of a collaborative initiative that has provided a unified voice with Council and identifies key areas to work together and collaborate on projects.

Information and education campaigns

The Councils' own information and education campaigns, as well as the behaviour change programmes of non-council organisations, are helping to create awareness of personal responsibility to reduce waste, and where and what people can recycle. Several strategies that have increased the impact of current communications strategies are:

- "Mainstream messaging" (i.e., that takes away the "greenie" perspective of waste minimisation).
- Tapping into social and environmental values – people are motivated when they know they should care (i.e., connecting waste with impact on the environment).
- Targeting workplaces – this can have a flow-on effect to people in their homes.
- Targeting industries/businesses that can influence the design phase of products (i.e., architects).
- Use of social media as a tool for creating social "buy-in".
- Education in schools - harnessing youthful energy. Children can also bring messaging home to their families.

Zero waste hubs, Community Resource Recovery Centres and repair cafes

Zero waste hubs, Community Resource Recovery Centres (CRRCs) and repair cafes in the Wellington region help to extend the life of materials, reduce waste, and support circularity in the region. This provides an opportunity to engage with the public and upskill communities, businesses and other waste generators in identifying and engaging with alternatives to landfilling their waste. As a region we can facilitate the expansion of the repair economy by encouraging consumers to choose alternatives to landfill.

In conjunction with promoting repair and reuse consumer behaviours, as a region we will work with businesses and organisations keen to establish repair and reuse services. This repair and reuse economy is a critical part of the circular economy and is beginning at a grass roots level, but there is a limit to what is possible without active support and partnerships. For example, many skills to repair products have been depleted and it will take time to regrow this skillset across many industries. However, growing the repair economy will not only reduce waste, but will also add value to the local economy. This may be through the promotion of local repair business and continued support of initiatives like repair programmes and repair cafes.

In addition, the 'right to repair' movement for appliances and bulky household items is gaining traction both globally and nationally. This movement focuses on the consumer and independent repairer's rights to repair goods which requires products to be designed in a way that is easily repairable. As a region and as discussed further in our regional actions (Section 6.1), consideration will be given opportunities to facilitate the repair economy and will, where appropriate, encourage retailers to voluntarily participate in product stewardship and take back old goods and packaging materials when supplying new goods to consumers –

building a repair, reuse, and repurpose economy. Further, the second-hand economy is reasonably well established across the Wellington region to enable the exchange of pre-loved items. However, there is plenty of room for this to grow with part of the challenge being encouraging more people to realise the benefits of this (including alternative drop-off or collection opportunities, active promotion of options for repurposing and purchasing second-hand items). Further, a sharing economy successfully facilitates sharing of goods that are infrequently used, which reduces demand for purchasing individual items. This can be facilitated through physical and virtual libraries and rental services.

Increased access to waste collection/processing/recycling services and initiatives

An increasing number and range of waste collection/processing/recycling services and initiatives have been operating in the Wellington region within the last WMMP period, including but not limited to:

- Green waste collections in new areas.
- Green waste processing into compost and mulch.
- Recycled crushed concrete for footpaths (this has been used in Wellington and Porirua).
- Recycling facilities accepting some types of demolition waste.
- Recycling of untreated timber mulched for playgrounds, silt control, coloured landscaping etc.
- E-waste recycling (i.e., repairing and bringing the item back up to specification).
- Processing of cathode-ray tube (CRT) in televisions.
- Processing of PVC/HDPE offcuts.
- Some collection and reprocessing of single-use medical consumables (note: only a very small percentage of total products are diverted from landfill).

In addition to the above, the Councils developed and adopted regionally consistent Solid Waste Management and Minimisation Bylaws during the period of the last WMMP.

The Wellington region should be proud of the progress it is making towards a low-waste, low-emissions future. However, the Councils recognise that this WMMP needs to be accelerated to support the transition for communities, mana whenua, businesses, and industry to reach their waste reduction aspirations.

4 Te moemoeā, ngā whāinga me ngā taumata hei whai | Vision, objectives and targets

Our WMMP vision, objectives, and targets provide a strategic framework for transforming the way the Wellington region generates, manages, and minimises waste.

They are the product of stakeholder engagement workshops held across the Wellington region to discuss the priorities for waste and resources, and what they wish to achieve as a region. These discussions were also informed by the issues and opportunities identified in the WRWA (and described above) and the outcome of the 2023 public consultation process.

Consideration was also given to aligning with the Government's strategic direction set out in key documents such as *Te rautaki para | Waste strategy*.

4.1 Vision

The vision for this WMMP is:

***Te mahi tahi hei whakaiti para - mā te tangata, mā te taiao,
me te ōhanga***

***Working together to minimise waste – for people,
environment, and economy***

This vision seeks to foster a collaborative approach to the way resources are managed and minimised in the Wellington region. It will guide the system change needed for the entire region, with a focus on transforming how waste is generated, managed, and minimised. Key to this will be understanding our individual and collective roles and working together effectively (including within and between Councils). To achieve this, this WMMP supports the Wellington region's shift from managing waste to enabling a step-change to influencing the production of waste, including how materials are used and recovered, all in keeping with *te pūnaha whakarōpū para | the waste hierarchy*. It also means utilising the tools the region has available and the need to understand the complex interrelationships and the role of culture, economy, environment and society in minimising and disposing of waste.

4.2 Guiding principles

There are seven principles at the heart of this plan. These principles guide how we will achieve our vision, objectives, and targets in this WMMP. They are informed by the Ministry for the Environment's *pūnaha whakarōpū para | waste hierarchy* and overarching *Te rautaki para | Waste strategy*. The principles set the direction for how we will work to implement our actions, focusing our attention on our priority areas and our desire to collaborate to achieve positive social, cultural, and environmental and economic outcomes for the Wellington region.

- **Whakamanahia Te Tiriti o Waitangi | Honour Te Tiriti o Waitangi** – We will work with mana whenua across the region to honour Te Tiriti o Waitangi in all of our work whether at a policy or project level to incorporate concepts of te ao Māori and support the growth and capability of our mana whenua partners.

- **Te whakaiti para | Waste reduction** – We will take a leadership role in the reduction of waste in accordance with the levels of te *pūnaha whakarōpū para* | *the waste hierarchy* and will support those already engaged in waste reduction efforts.
- **Ōhanga āmiomio | Circular economy** – We will promote a low waste, circular economy and contribute efforts to reduce the environmental impacts of waste across the Wellington region by keeping materials at their highest value for as long as possible and increasing the reuse, repurposing and recovery of resources.
- **Te tiakitanga taiao | Environmental guardianship** – We will take into account the limitations of our planet and its resources by recognising the need to protect, enhance, and restore ecosystems for current and future generations.
- **Te wero i ngā aronga hinengaro | Challenging mindsets** – We will encourage and promote habits and behaviours that focus on the circularity of materials, ensuring sustainable and responsible consumption, the reduction of waste emissions and the reuse and recovery of products and materials.
- **Te mahi tahi me te whai wāhitanga | Collaboration and participation** – We will look for opportunities to collaborate across the region as Councils as well as with mana whenua, businesses, industry, community organisations and NGOs. This is to increase capacity and capability to deliver wider social, cultural, environmental and economic benefits to our communities.
- **He pūnaha manawaroa mō te para me te taumanu rawa | Resilient waste and resource recovery system** – We will continue to invest in the Wellington region's waste and resource recovery system and our data management systems in alignment with *Te rautaki para* | *Waste strategy* and the Action and Investment Plan to ensure they are fit for purpose going forward. We will manage any residual waste in accordance with best practice.

4.3 Objectives

To support the vision, this WMMP includes nine overarching objectives that reflect the priorities, issues, and opportunities identified by the Councils and the stakeholders engaged as part of developing this WMMP. The objectives signal a significant shift in how the Wellington region thinks about waste, the services and infrastructure the region provides, and how businesses, industry, mana whenua, and communities can contribute to making a difference for our region's future. These objectives aim to strike a balance between ambition and action.

Combined with the guiding principles, the nine objectives set the direction for the Wellington region's waste system. The nine objectives are as follows:

Objective 1: Waste and resource recovery systems support a reduction in greenhouse gas emissions from landfills and waste collections

The intent of this objective is to create systems that help reduce the amount of greenhouse gases emitted during waste management processes. This objective focuses specifically on emissions produced from disposal of waste to landfills and council-controlled collections (for example: waste, recycling, organics).

Objective 2: There is collective responsibility within the Wellington region for reducing our resource use and protecting our natural environment

The intent of this objective is to emphasise that everyone in the Wellington region shares the responsibility for protecting and conserving our resources and environment. This highlights the need for collaboration and cooperation among communities, mana whenua, businesses and industry, as well as advocacy to central government, in order to achieve sustainable waste management practices.

Objective 3: The conditions are in place to encourage everyone to use fewer resources and minimise waste

The intent of this objective is to promote waste minimisation at individual, business, and organisational levels. By encouraging and supporting communities, mana whenua, businesses and industry to minimise waste generation, and supporting those already doing so, this objective aims to foster a culture of waste reduction and resource conservation.

Objective 4: Material circularity is increased through reuse, resource recovery, waste infrastructure and services

The intent of this objective is to establish waste and resource recovery services, systems and infrastructure that promote material circularity. This means designing systems that enable the reuse, repurposing and recycling of materials, reducing the reliance on raw resources and minimising waste sent to landfills.

Objective 5: It is accessible and convenient to reduce waste, reuse materials and minimise disposal to landfill in line with the waste hierarchy

The intent of this objective is to ensure that residents and businesses have easy access to waste diversion options and that these options are convenient to use. By making waste diversion accessible and convenient, the aim is to encourage greater participation and compliance with sustainable waste management practices, with waste to landfill a last resort.

Objective 6: Waste and resource recovery data systems are in place to track and monitor waste streams.

This objective focuses on establishing traceability and transparency within waste and resource recovery systems. The intent is to create systems that allow for clear tracking and monitoring of waste, ensuring accountability and facilitating better decision-making for waste management.

Objective 7: Resource recovery facilities and waste systems are resilient and able to cope with emergency events

The intent of this objective is to emphasise the role of waste and resource recovery infrastructure and services in the case of emergency event. Resilience of the waste management system should be considered when making regional decisions on infrastructure and services.

Objective 8: Recovery of materials is maximised so that landfills are used as a last resort

This objective emphasises treating waste disposal infrastructure as a limited resource. This involves implementing strategies to extend the lifespan of existing disposal facilities, exploring alternative waste treatment methods, and promoting sustainable waste disposal practices.

Objective 9: Waste that cannot be prevented or diverted from landfill is managed safely and effectively in accordance with best practice

The intent of this objective is to ensure that any remaining waste after recycling and recovery processes is managed safely and effectively. The objective involves adhering to established best practices for waste management, including proper handling, treatment, and disposal methods to minimise potential environmental and health impacts.

4.4 Targets

The targets within this WMMP provide a clear and measurable way to determine how, as a region, steps are taken to achieve the objectives. The following targets have been set so that as a region, there is accountability. The targets are ambitious, and they align with *Te rautaki para* | *Waste strategy*. These targets are also spread over the life of this WMMP to enable the Councils to manage costs over a longer period while the necessary changes to the region are embedded, rather than playing catch up once that change is

already in place. The following targets apply across the Wellington region and progress against these will be measured and reported upon collectively as a region annually:

1. Reduce the total amount of material that needs final disposal to landfill by:

- 10% by 2027.
- 30% by 2030.

We will work towards this by achieving the following sub-targets:

- a. Ensuring construction and demolition processing and recovery is available in the Wellington region by 2026.
 - b. Ensuring a regional organics processing facility or facilities are available by 2029.
 - c. Ensuring five new resource recovery locations are added to the existing network within the Wellington region by 2030.
2. Reduce emissions from biogenic methane by reducing the total amount of organic waste disposed to landfill by 50% by 2030.
 3. Reduce emissions from the transport of waste by 50% by 2030.
 4. Ensure all urban households have access to kerbside recycling collections by 2027.
 5. Ensure food scraps collection services are available to urban households by 2030.
 6. For each council to engage with and support 50% of the business community to minimise waste and implement waste minimisation activities.

As highlighted previously, the existing data is limited for waste disposal, and even more so for waste generation and diversion. While the Councils have objectives and actions directed at the upper two levels of the waste hierarchy, the data to support measuring targets associated with this is sparse and very limited. The Councils will continue to, over the course of this WMMP, identify how to gain data and measure activity in the upper two levels of the waste hierarchy and contribute to achieving the *Te rautaki para | Waste strategy* target for reducing the amount of material entering the waste management system. The Councils will refine the baseline measures for each target during implementation. However, for the purposes of targets 1 – 2, the 2021/22 waste data from the WRWA will be used as a baseline for measuring success.

5 Ka pēhea tā tātou whakaiti para, e nui katoa ai hoki i te wāriu o ngā rauemi | How we will reduce waste and maximise the value of materials

It's important that this WMMP outlines the different roles and responsibilities within the system, and lays the foundations for a truly regional, collaborative approach to waste management and minimisation activities. Key to this will be identifying opportunities for partnership and collaboration and agreeing common principles to guide the work that we do together over the next six years, and beyond.

5.1 Roles and responsibilities

The councils of the Wellington region have many roles which are outlined below and described in terms of how we can influence waste outcomes. Waste is also affected by how councils carry out its activities. The following outlines the methods that will be used by the Councils through roles and responsibilities of the Councils, mana whenua, central government, community, industry, businesses and residents. It also outlines how all parties will work in partnership to implement this WMMP.

This working approach with stakeholders and partners will endeavour to:

- Protect and enhance the mauri of resources by working towards a circular economy approach.
- Engage with, empower and involve our community in changing behaviour and solutions.
- Apply a waste hierarchy approach, to increasingly shift our effort and focus towards enabling redesign, reduction and reuse.

By taking a circular economy approach to the waste hierarchy, this will help the Wellington region to understand the complexity of waste and resources and will enable the region to prioritise and focus efforts where the use of resources begins and follow it through its lifecycle.

5.1.1 Collective Ownership of the Waste Problem

Alongside the Councils, central government, mana whenua, communities, industry and businesses all have a vital role to play in protecting the Wellington region's environmental resources. We all need to make responsible choices for managing and minimising our waste by understanding our individual and community impact on our city and our environment. As a collective issue, waste requires a collaborative solution. A model of collective responsibility and action is needed to achieve our vision. Transitioning from a 'take-make-dispose' society to a circular economy where we keep resources in use for as long as possible is a vital step toward minimising waste, circulating resources and adopting a low carbon, resource efficient system.

The below sections outline the different roles required from all our stakeholders and partners in the Wellington region.

5.1.2 Councils' Role

The Councils of the Wellington region have many roles which are outlined below and described in terms of how they can influence waste outcomes. Alongside other stakeholders, we play an important role in the waste management and minimisation system. We influence outcomes through our role as key facilitators, funders, providers, regulators and coordinators of waste management and minimisation activities (described below). At the heart of this, the Councils in the Wellington region will continue to work together and facilitate conversations across the waste, community, and business sectors to build the relationships necessary to drive transformation and a reduction in waste.

- **Provider:** Councils have a role in providing or facilitating the provision of waste management and minimisation services such as resource recovery centres, transfer stations and landfills. Councils also work towards providing accessible and convenient options to encourage the recovery and recycling of materials. Councils can also influence waste reduction outcomes through procurement policies and practices.
- **Funder:** We invest and provide support for businesses and communities by funding initiatives which will help our cities and districts to reuse, recycle and recover resources and waste. To give effect to this, councils may use a range of mechanisms including the promotion via procurement policies and practices the use of recovered materials in contractual arrangements where appropriate, designing out waste through councils' own procurement practices and investigate social procurement practices where waste reduction and diversion services supports the development of infrastructure.
- **Partner:** We collaborate and partner with mana whenua and various stakeholders including communities, NGOs, businesses, and industry to achieve waste minimisation outcomes. We recognise that local and regional providers can deliver and achieve waste minimisation outcomes alongside Councils. The Councils recognise the breadth and depth of skills and experience that are present across the region as well as the connections and relationships between organisations and partners. As such, collaboration across our eight councils is a priority as we look to collectively deliver actions to solve problems and grow councils' internal capability.
- **Facilitator:** We bring people together to discuss issues, share ideas and connect people. This includes working alongside mana whenua, communities, industry, and businesses to rethink waste and understand their part in driving behaviour change. By fostering engagement, Councils empower communities, mana whenua, businesses, and industry to participate in waste minimisation activities.
- **Advocate:** We advocate for system change in waste management on behalf of our communities. We will advocate for transformative policies, legislation, standards and guidelines from central government and the waste and business sectors. We will also advocate internally to ensure initiatives being delivered by our Councils are joined up and aligned with this WMMP. This WMMP will set the direction for our councils and our community's waste minimisation efforts across all our work.
- **Regulator:** We are responsible for developing waste management and minimisation policies and strategies that align with national policy. We utilise our bylaws and planning processes to influence cross sector outcomes to achieve waste avoidance and reduction which are also important for business success. In the waste space, our regulatory role covers our Solid Waste Management and Minimisation Bylaw, trade waste and litter bylaws which are anticipated to have substantial influence on how groups consider the management of waste. The bylaws are also an important opportunity to collect data to inform councils waste minimisation efforts. We also have a role to play in influencing our city and district plans to support waste reduction.

To implement *Te rautaki para* | *Waste strategy* and other policies, central government has highlighted that the role of councils will change over the next 30 years. This includes improving data collection, requiring the implementation of standard kerbside collections (including food scraps), increasing available funding through the waste disposal levy. To meet Aotearoa New Zealand's commitment under the Emissions Reduction Plan, there will be a need for additional regional infrastructure for resource recovery. Councils are expected to plan for, support and in some cases provide infrastructure to support collection, recovery, reprocessing and disposal networks. To achieve this, central government have indicated that they will continue to allocate resources, funding, and grants in line with *Te rautaki para* | *Waste strategy* and the Action and Investment Plan, which will be counted on to deliver this WMMP.

5.1.3 The Role of Regional Council

Regional council plays a complementary role to the Councils especially in relation to minimising the environmental impact of waste such as litter in waterways, soil contamination, and air pollution. While the

Greater Wellington Regional Council (GWRC) does not have a statutory responsibility under the Waste Minimisation Act 2008, they regulate many of the waste management and minimisation activities such as the operation of a composting facility or a landfill. Collectively, by minimising the waste that enters the natural environment, the Councils and GWRC can achieve more positive outcomes for the region's natural and physical resources.

5.1.4 The Role of Central Government

The central government plays a crucial role in supporting this WMMP and its implementation. Central government provides the overarching policy frameworks, guidelines, legislation to guide and mandate the waste management practices across Aotearoa New Zealand, and access to funding for this transformation.

Within *Te rautaki para* | *Waste strategy*, central government has set national waste management goals and targets, aligning them with a vision for Aotearoa New Zealand to shift to a low-emissions, low-waste society built upon a circular economy by 2050. There are also interconnected policies and strategies developed or under development, including the Emissions Reduction Plan and Circular Economy and Bioeconomy Strategy, that discuss the existing waste issues and future opportunities.

Through its involvement, central government should help ensure a coordinated and integrated approach to waste management and minimisation in the Wellington region, promoting consistency, accountability, and positive environmental outcomes.

5.1.5 The Role of Community Organisations and Non-Governmental Organisations

Community organisations (e.g., zero waste hubs, community resource recovery centres) and non-governmental organisations (NGOs) collectively play an instrumental role in waste management and minimisation in the Wellington region.

Councils have a key role in ensuring that diverse perspectives, values, needs, experiences, and aspirations are taken into account in community waste management and minimisation decisions. Forming partnerships and strategic alliances with a range of parties is a key mechanism to drive behaviour change and to support the community's waste minimisation efforts. As such, actively involving the community in design and delivery of resource management activities will contribute to a culture shift towards the reduction of waste.

By raising community awareness and understanding of waste generation, minimisation and management issues, through advocacy and education, we can inform and meaningfully contribute to driving positive cultural, systems and behavioural change.

We cannot transform the way we collectively generate, manage, or minimise waste without a social licence from our communities. The role of communities includes:

- **Input and Feedback:** Community members and/or organisations have the opportunity to provide input and feedback on waste management and minimisation plans, policies, and initiatives. This can be done through public consultations, surveys, community meetings, or online platforms. Their perspectives help shape the direction of waste management and minimisation strategies and activities and ensure they align with community values and aspirations.
- **Education and Awareness:** Community members and/or organisations engaging and educating their community about waste generation, waste minimisation practices, recycling programs, and responsible waste disposal is crucial. This includes raising awareness about the environmental and financial impact of waste, promoting behaviour change, and providing information on how individuals and households can contribute to reducing waste. Community members can also play a role in sharing knowledge and supporting and encouraging others to adopt sustainable practices.
- **Active Participation:** Community members and/or organisations understand their responsibility to actively participate in waste reduction activities and initiatives and are empowered to do so. This can

involve participating in recycling programs, community composting initiatives, community clean-up events, or volunteering for local waste management projects. By actively engaging in these activities, community members and/or organisations contribute to tangible waste minimisation efforts and foster a sense of ownership and pride in their local environment.

- **Collaboration with Local Organisations:** Community members and/or organisations can collaborate with other local organisations (e.g., community groups, schools, businesses, non-profit organisations) and/or businesses to promote waste reduction initiatives. This may involve organising awareness campaigns, hosting workshops or events, or establishing partnerships to implement recycling programs or support local circular economy initiatives. In addition, the collaboration of communities and social enterprises plays an important role in the implementation of the WMMP particularly through a procurement approach as it not only helps with reducing waste but gives the community a sense of involvement. By working with others, communities can have a larger and more enduring impact.

5.1.6 The Role of Industry and Businesses

Both the waste industry and other commercial businesses (e.g., retailers, hospitality, manufacturers) play essential roles in the waste management and minimisation system. Building circularity into the industry and businesses' waste system will help to increase the Wellington regions waste system resilience by placing more responsibility onto individuals and businesses to make waste minimisation front of mind. A circular economy also offers the potential to create new employment opportunities, reduced consumption and disposal, and sustainable growth by increasing repair and resource recovery activities. The waste industry is a key manager of waste and recycling in the region and should be at the forefront of innovative technologies. Businesses also play an important role by reducing waste, complying with regulations, and fostering partnerships and innovation with industries, councils and communities.

5.1.7 The Role of the Waste Industry

The waste industry encompasses waste collectors and processors, recycling sorting and processing facilities, resource recovery centres, composting centres, and waste treatment facilities. The waste industry's role includes:

- **Waste Collection:** Waste collection companies play a crucial role in collecting and transporting waste from households, businesses, and public areas to appropriate facilities. They ensure safe transportation to designated locations.
- **Recycling and Resource Recovery:** Recycling facilities within the waste industry process recyclable materials collected from households and businesses. They sort, clean, and process materials such as paper, plastic, glass, and metal to be turned into new products, thereby conserving resources and reducing waste.
- **Waste Treatment and Disposal:** Waste treatment facilities manage various waste streams, including hazardous waste or materials that cannot be recycled. They employ specialised processes to minimise environmental impacts and ensure safe disposal or treatment of waste in compliance with the relevant legislative frameworks.
- **Innovation and Technology:** The waste industry also plays a role in driving innovation and adopting advanced technologies for waste management. This includes exploring new methods of waste reduction, transportation, improving recycling processes, and finding sustainable alternatives for waste treatment.
- **Collaboration and Partnerships:** Industry can collaborate with Councils and other stakeholders to develop and implement waste management and minimisation initiatives. This may involve supporting community innovation and scaling it up or collaborating on community shared spaces for waste

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recovery or repair. Industry can also implement Council ideas for new resource recovery networks to respond to regional needs.

5.1.8 The Role of Businesses

Other commercial businesses, including retail stores, restaurants, offices, and manufacturing facilities, also have a significant role to play in the waste management and minimisation system. Their role includes:

- **Waste Reduction:** Businesses can actively implement waste reduction strategies, such as using their market strength to influence production processes, minimising packaging, promoting reusable products, and adopting practices that reduce waste generation at the source. This includes initiatives like bulk-purchasing, composting organic waste, and implementing internal recycling programs.
- **Compliance and Reporting:** Businesses need to adhere to waste management regulations and reporting requirements set by the Councils' Solid Waste Management and Minimisation Bylaw. This involves properly segregating waste, ensuring proper disposal of hazardous materials, and maintaining accurate records of waste generation and disposal.
- **Collaboration and Partnerships:** Businesses can collaborate with Councils and other stakeholders to develop and implement waste management initiatives. This may involve participating in community recycling programs, supporting local circular economy initiatives, or partnering with waste management service providers.
- **Education and Awareness:** Businesses can contribute to raising awareness and educating employees, customers, and suppliers about waste management best practices. This can include training programs, providing recycling bins and signage, and promoting responsible waste disposal within their premises.

5.1.9 The Role of Residents

Our regions residents are the customers of our current take-make-dispose linear economy through our consumption of goods and services and are a key influence in every step of the waste hierarchy.

- **Rethink/Redesign:** Consumer participation in waste minimisation efforts play a vital role in protecting our natural resources. Consumers have a role to play in prevention of the extraction of virgin materials, and increased regeneration, by, for example, avoiding products that use unnecessary packaging, or by avoiding purchasing products produced by 'fast fashion'.
- **Reduce:** Consumers can reduce waste by being more mindful and only buying what they really need and planning consumption and purchasing of perishables to avoid discarding spoiled food.
- **Reuse/Repurpose:** Consumers can maintain or repair items to retain their usefulness or repurpose products for alternative use and drop off items they no longer need at recycling centres (e.g., council and/or community second hand stores) for others to reuse or repurpose.
- **Recycle/Organics Processing:** Consumers can choose products made from materials that are easily and continuously recycled, make sure their recyclables are recycled in the right receptacle, and ensure unavoidable food scraps and garden waste are appropriately processed (e.g., composting).

5.2 Collaboration and partnerships

Councils cannot do all the work set out in this WMMP on their own. Rather, we need to bring together diverse perspectives and expertise from across industry, the businesses community, other councils, mana whenua, and community organisations/NGOs to leverage creative thinking and collaborative efforts. Collaborating and partnering with mana whenua to integrate Māori values, mātauranga Māori (indigenous knowledge), and tikanga (customs) into waste management strategies, practices and decision-making processes will be particularly crucial to ensuring these meet the needs and aspirations of Māori.

The councils of the Wellington region will also collaborate and collectively work together to deliver the range of regional actions (see Section 6.1 for more detail), and will where appropriate, coordinate work programmes and collectively work to solve regional problems. We will do this through the actions included in this cross-council WMMP.

By working together, we can drive innovation, foster collective responsibility, develop more efficient and sustainable practices, and ultimately make a larger, and more enduring impact. Collaborating will also help to ensure that infrastructure investments are well-informed, financially viable, and aligned with community needs.

To achieve this, the Councils will seek to collaborate and partner with mana whenua, industries and businesses, and communities. It will also look for opportunities to foster and facilitate information-sharing and innovation, collaboration and partnerships between key stakeholders, mana whenua and communities, to help synergise efforts and identify opportunities for improvement.

As highlighted below, there is already mahi (work), collaborations, and partnerships underway in the region to improve the region's resource recovery system. This WMMP will support and build on these, including (but not limited to):

- Zero waste hubs, Community Resource Recovery Centres (CRRC) and repair cafes across the region.
- Waste reduction and recycling initiatives (e.g., battery recycling trials, soft plastic recycling, and waste education programmes in schools).
- Public information, education and behaviour change campaigns (e.g., Porirua City Council's "Three Strikes" scheme, Hutt City Council kerbside behaviour change and "Three Strikes" scheme, and Kāpiti Coast District Council's "love your waste" campaign).
- Forums, co-operatives and partnerships between Councils, communities, businesses and industries, such as Waste Free Welly (community-led) and the Wellington Waste Forum (Council-led).
- Increased access to waste collection/processing/recycling services and initiatives.

Further information about how this WMMP will support collaboration and partnerships is included in the Regional and Local Actions Plans (see Sections 6.1 and 6.2, respectively for more detail).

As highlighted in Section 2.5 of this Plan, the joint Councils remain committed to upholding the principles of kaitiakitanga (guardianship) and environmental care (taiao) and developing a meaningful partnership with mana whenua that delivers on Māori needs and aspirations for the waste sector.

Alongside this important mahi, this WMMP seeks to work collaboratively with mana whenua, including supporting and empowering whānau (families), hapū (sub-tribes), iwi (tribes), land trusts, Māori businesses, and communities in their efforts to reduce, recycle, and reuse waste as valuable resource opportunities, and actively involving mana whenua in waste management and minimisation decisions.

| Ka pēhea tā tātou whakaiti para, e nui katoa ai hoki i te wāriu o ngā rauemi | How we will reduce waste and maximise the value of materials |

*Together, the Wellington region has the ability to drive positive change
and create a cleaner, greener future.*

6 Ngā mahere mahi | Action plans

The Regional and Local Action Plans are roadmaps that identify what steps must be taken to achieve the objectives of this WMMP. Collectively, they set the wheels in motion and steer us toward the long-term achievement of this WMMP.

The action plans are a 'living' document that can be updated to reflect progress made²³. They can be reviewed and updated if changes are needed to ensure the Councils are heading in the right direction. This ensures that the Wellington region is agile and able to adapt and respond to any unforeseen or emerging issues, or changes in waste minimisation initiatives, both nationally and internationally.

The actions are grouped according to their impact on *te pūnaha whakarōpū para* | the waste hierarchy, which establishes a general priority to focus on keeping materials at their highest value. The overarching ambition is to eliminate the need to dispose of waste in the first place, which will help drive the transformation needed to meet our ambitious targets.

For clarity, the Regional and Local Action Plans are discussed and presented in the following sections:

- Regional Action Plan – Section 6.1
- Local Action Plans – Section 6.2

6.1 Regional actions

The following table sets out the actions that the eight councils in the region will collectively undertake or support, with mana whenua partners and stakeholders, to deliver on the vision, objectives and targets of this WMMP. These actions will contribute to meeting the objectives and targets as detailed in in Section 4.4.

As noted above, the regional actions have been grouped according to their impact on *te pūnaha whakarōpū para* | the waste hierarchy. The intent of this approach supports the transition for councils to place greater focus on the higher levels of the hierarchy whilst acknowledging that Councils have an important role in continuing to provide and maintain current services and activities. As such, this transition is expected to take time with external factors such as governmental changes (e.g., waste legislation and government waste programme focus areas) also anticipated to influence and shape the range of regional actions (e.g., delivery timeframes). However, the councils of the Wellington region recognise the importance of this transition and as such are committed to work collaboratively to deliver the regional actions.

The key regional actions are summarised in the below list:

- Providing and supporting education initiatives within the Wellington region that focus on waste minimisation and responsible consumption.
- Supporting new and existing regional and local waste minimisation initiatives.
- Improving the way we connect and collaborate across the region on waste management and minimisation initiatives.
- Ensuring appropriate kerbside services are in place for recycling and organic waste.
- Ensuring appropriate regional infrastructure is in place to meet our targets and objectives.
- Investigating ways to effectively manage and monitor cross boundary and inter-regional waste flows.

²³ Under section 44 of the WMA 2008, Waste Management and Minimisation Plans can be updated without triggering the need for a formal review of the Waste Management and Minimisation Plan, as long as the changes are not significant and do not alter the direction and intent of the Waste Management and Minimisation Plan. A council's Significance and Engagement Policy is also a relevant consideration in making this determination.

- Investigating options for future disposal of residual waste and what this may look like in the long term.

The below table provides a detailed breakdown of each action against the level of the waste hierarchy, alignment with objectives, the primary role of council, anticipated funding options and the anticipated delivery timeframe.

Regional Action Plan

#	Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
Reduce, rethink, redesign						
1	Reduce, rethink, redesign	Allocate resources for the implementation of the WMMP at a regional level. This could include funding for human resources, projects and initiatives and development of the next WMMP. Identify opportunities to collaborate with other organisations to fund regional projects or initiatives.	All	Funder	Waste Levy General Rates	Ongoing
2	Reduce, rethink, redesign	Strengthen regional collaboration and connections between, the Councils, mana whenua, community groups, businesses, and other organisations. Support the design and delivery of regional WMMP projects and initiatives.	2, 3, 4	Partner, Facilitator	Waste Levy General Rates Other	2024
3	Reduce, rethink, redesign	Advocate to central government for policies and initiatives that will improve outcomes for reuse and waste reduction initiative in the Wellington region.	2	Advocate	Waste Levy General Rates	Ongoing
4	Reduce, rethink, redesign	Where appropriate, support, fund, and deliver consistent and coordinated behaviour change messaging, communications and education programmes that focus on waste minimisation and responsible consumption.	2, 3	Funder, Facilitator	Waste Levy General Rates	2024 - 2025
5	Reduce, rethink, redesign	Continue to implement the regionally consistent solid waste management and minimisation bylaws and review current regulatory tools to ensure they support the objectives of the WMMP.	3, 4, 6	Regulator	General Rates Fees and Charges Waste levy	Ongoing implementation
Recycle, compost, anaerobic digestion						
6	Recycle, compost, anaerobic digestion	Investigate and/or implement options for establishment or improvement of regional infrastructure and services. This could include, organic waste, C&D waste, biosolids, materials recovery facilities, and a region wide resource recovery network.	1, 4, 5	Partner	General Rates Targeted Rates Fees and Charges Waste Levy Other	Ongoing
7	Recycle, compost, anaerobic digestion	Implement systems to track and monitor how our waste moves around the Wellington region.	6	Regulator	Waste Levy General Rates	2024 - 2025

#	Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
8	Dispose	Monitor litter across the region to understand the extent of the issue and implement further actions to prevent harm to our natural environment	2, 9	Partner	Waste Levy General Rates	2025 - 2026
9	Dispose	Ensure the Wellington region has a plan to address waste from emergency events and post-event recovery activities such as via the Wellington Region Emergency Debris Disposal Guideline or other appropriate plans. The plan would include identifying risks and hazards to waste and resource recovery infrastructure in the region and to provide information on how waste generated from disaster events will be managed.	2, 7, 8, 9	Provider	General Rates Fees and Charges	Ongoing
10	Dispose	Prepare a regional waste disposal plan which considers options for waste that cannot be prevented or diverted from landfill.	2, 7, 8, 9	Provider, Facilitator	General Rates Fees and Charges	2025 - 2026

We have also included a table below to demonstrate how the regional actions and targets put forward as part of this WMMP address the key challenges described in Section 3.5:

Regional Challenge:	Aligned Regional Actions/Targets:
Weak pricing signals	- Regional action #3 (Advocate for policies that will improve outcomes) - Regional action #6 (Regional infrastructure, which could include options for organic waste and biosolids)
Limited data	Regional action #7 (Investigate and implement methodologies to consistently measure and record material flows across the region)
Recycling performance	- Regional action #4 (Waste minimisation education and responsible consumption) - Regional action #7 (Measure and record material flows across the region)
Low diversion of organics from landfill	- Regional action #6 (Regional infrastructure, which could include options for organic waste and biosolids) - Target 2 (Reduce emissions from biogenic methane) - Target 5 (Ensure food scraps collection services are available to urban households by 2030)
Barriers to working together regionally – Including partnering with mana whenua	- Regional action #1 (Fund resources for implementation of this WMMP, and look for opportunities to collaborate) - Regional action #2 (Commit to strengthening a regional framework to support collaboration)
Increase in C&D waste from urban development	- Regional action #5 (Implement bylaws and review regulatory tools) - Regional action #6 (Establish or improve regional infrastructure and services), - Regional action #7 (Measure and record material flows across the region)
Consumption habits	- Regional action #3 (Advocate for policies that will improve outcomes) - Regional action #4 (Waste minimisation and responsible consumption education) - Regional action #5 (Implement bylaws and review regulatory tools)
Need for new infrastructure	- Regional action #2 (Delivery of regional projects and initiatives) - Regional action #3 (Advocate for policies for reuse and waste reduction) - Regional action #6 (Regional infrastructure and services).
Government legislation still in development	Regional action #3 (Advocate for policies that will improve outcomes)
Litter and illegal dumping	- Regional action #3 (Advocate for policies for reuse and waste reduction) - Regional action #8 (Consistent monitoring of litter across the region)
Unforeseen events/waste resilience	Regional action #9 (Regional disaster management plan)

6.2 Local actions (by each council)

The tables below set out the range of actions that the eight councils in the region will individually undertake to deliver on the vision and objectives of this WMMP, while ensuring that they meet the needs and concerns of their own communities. These actions will contribute to meeting the targets described in Section 4.4.

Hutt City Action Plan

#	Waste Hierarchy Level	Action	Align with Objectives	Primary Role of Council	Funding Options	Timeframe
Reduce, rethink, redesign						
1	Reduce, rethink, redesign	Provide support to local iwi groups and/or other organisations that provide tikanga māori perspectives on waste minimisation initiatives.	2, 3	Partner	Waste Levy	Ongoing
2	Reduce, rethink, redesign	Consider, and/or implement ways to demonstrate waste minimisation and circular economy principles in Council facilities, activities and procurement.	1, 2, 3	Provider	Waste Levy	Ongoing
3	Reduce, rethink, redesign	Continue to embed decarbonisation of Hutt City Council contracts and associated procurement processes.	4	Facilitator, Funder	Waste Levy General Rates Fees and Charges Other	Ongoing
4	Reduce, rethink, redesign	Assist local businesses with waste minimisation practices by offering free waste audits, presentations and supporting solutions.	3, 5	Funder	Waste Levy	Ongoing
5	Reduce, rethink, redesign	Utilise the networks and relationships of NGOs to deliver waste minimisation and behaviour change messaging to our community and other stakeholders.	2, 3	Partner	Waste Levy	Ongoing
6	Reduce, rethink, redesign	Continue to support and strengthen the relationships with our waste minimisation partners to improve outreach.	2, 3	Partner, Facilitator	Waste Levy	Ongoing
7	Reduce, rethink, redesign	Investigate and/or implement ways to improve the availability of waste and climate related information to the public.	2, 5, 6	Facilitator	Waste Levy	Ongoing
8	Reduce, rethink, redesign	Share the ongoing achievements of businesses, NGOs and the community's efforts in reducing and diverting waste through Council forums and communications.	2, 3	Facilitator	Waste Levy	Ongoing

Ngā mahere mahi | Action plans

#	Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
9	Reduce, rethink, redesign	Continue to implement solid waste management and minimisation bylaw provisions while monitoring and enforcing current provisions.	1, 2, 5	Regulator	General Rates	Ongoing
10	Reduce, rethink, redesign	Advocate for better waste outcomes to central government and other national bodies of influence.	2	Advocate	Waste Levy	Ongoing
11	Reduce, rethink, redesign	Investigate current, new and emerging technologies and/or approaches that support the future of waste disposal.	1, 4	Provider, Partner	Waste Levy General Rates	Ongoing
Reuse, repair, repurpose						
12	Reuse, repair, repurpose	Support regional development of regional resource recovery networks to minimise waste and move to a circular economy. This could include, but is not limited to, options for organic waste, C&D waste, biosolids, materials recovery facilities, and a region wide resource recovery network.	2, 4, 5	Partner, Facilitator	Waste Levy Fees and Charges General Rates	Ongoing
13	Reuse, repair, repurpose	Collaborate with councils from the Wellington region to establish collections and processing of C&D waste aligned with reducing waste to landfill.	2, 4, 5	Partner	Waste Levy Fees and Charges General Rates	2023 - Ongoing
Recycle, compost, anaerobic digestion						
14	Recycle, compost, anaerobic digestion	Investigate and/or implement ways to reduce the disposal of food and/or green waste to landfill.	1, 2, 3, 5	Provider	Waste Levy General Rates Targeted Rates Other	Ongoing and Implement by 2030
15	Recycle, compost, anaerobic digestion	Work with regional water authorities to explore options for the reduction and diversion of wastewater biosolids from landfill.	2, 4	Partner	Waste Levy	2023 - Ongoing
Recover value						
16	Recover value	Maximise the destruction of methane emissions at Silverstream Landfill and recover energy via the powerplant.		Provider	Fees and charges	Ongoing
Dispose						
17	Dispose	Support regional investigations into methods/technology for monitoring and reducing illegal dumping, and litter and other	2, 9	Provider, Partner	Waste Levy	2023 - Ongoing

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| Ngā mahere mahi | Action plans |

#	Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
		contaminants from entering our infrastructure networks and natural amenities.				
18	Dispose	Investigate and/or implement remediation and further actions (including the use of technology) to prevent harm to our natural environment caused by litter and illegal dumping	2.9	Provide, Funder	Waste Levy	2023 – ongoing
19	Dispose	Identify and action opportunities for ongoing improvements to the kerbside rubbish and recycling service.	6, 7, 8, 9	Provider, Partner	General Rate Targeted Rates	Ongoing
20	Dispose	Investigate and/or implement ways to improve the service and operations to mitigate the environmental impacts from Silverstream Landfill.	6, 7, 8, 9	Provider, Partner	General Rates	Ongoing
21	Dispose	Continue to monitor and manage closed landfills to ensure public and environmental health impacts are minimised in line with relevant environmental and safety objectives.	9	Provider	General Rates	Ongoing

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Kāpiti Coast Action Plan

#	Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
Reduce, rethink, redesign						
1	Reduce, rethink, redesign	Educate residents in waste minimisation by providing information and resources which may include workshops, talks, the Council website, social media, newspapers, pamphlets, and posters.	3, 5	Facilitator	Waste Levy General Rates	Ongoing
2	Reduce, rethink, redesign	Support educational institutions on waste minimisation, via programmes which may include the Zero Waste Education programme, Paper4Trees, cloth nappies trial for pre-schools and EnviroSchools.	3, 5	Provider, Funder, Facilitator	Waste Levy	Ongoing
3	Reduce, rethink, redesign	Support principles of Te Ao Māori and provide support to local iwi groups. This may include education programmes, grants, and event waste management advice.	3, 5	Partner	Waste Levy General Rates	Ongoing
4	Reduce, rethink, redesign	Provide annual contestable waste minimisation grants for community groups, and explore options for streamlining the community grants process.	3, 5	Funder, Facilitator	Waste Levy	Ongoing
5	Reduce, rethink, redesign	Support effective waste management and minimisation at large events through implementation of the solid waste bylaw, and provide support with resource bookings, advice, planning meetings etc.	3, 4, 5	Regulator	Waste Levy	Ongoing
6	Reduce, rethink, redesign	Investigate options to increase number of post-event waste audits being submitted.	3,5	Funder, Facilitator	Waste Levy	Ongoing
7	Reduce, rethink, redesign	Provide annual contestable Business Waste Minimisation Grants and explore options for streamlining the business grants process.	3, 5	Facilitator	Waste Levy General Rates	2023 – onwards
8	Reduce, rethink, redesign	Work with local businesses to investigate, consider, trial and implement initiatives that achieve waste reduction. Support and the development of Pakihi Toitū o Kāpiti – Sustainable Business Kāpiti – including via the Business Waste Minimisation Consultancy Programme.	2	Partner	Waste Levy General Rates	Ongoing

Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
	Consider and respond to Government legislative changes, including <i>Te rautaki para</i> Waste strategy, Waste Minimisation Act, Litter Act, and Resource Management Reforms.				
	Reuse, repair, repurpose				
9	Reuse, repair, repurpose Maintain or develop new leases for Council land, including using closed landfills for resource recovery operations. Continue to support waste minimisation groups with affordable leases, including Zero Waste Ōtaki and Ōtaihanga Zero Waste Hub.	4, 5	Partner	Other	Ongoing
	Recycle, compost, anaerobic digestion				
10	Recycle, compost, anaerobic digestion Ensure all households in urban areas have kerbside food scrap collection by 2030, or earlier.	3, 4, 5	Provider	Targeted Rates	By 2030
11	Recycle, compost, anaerobic digestion Ensure all households in urban areas have access to kerbside recycling by 2027, or earlier.	3, 4, 5	Provider	Targeted Rates	By 2027
12	Recycle, compost, anaerobic digestion Investigate, trial and implement support for waste minimisation projects in educational institutions, which may include waste audits, setting up recycling systems, composting information and provision of worm farms.	3	Facilitator	Waste Levy	Ongoing
13	Recycle, compost, anaerobic digestion Support, create, or increase engagement in targeted educational campaigns and projects, which may include niche recycling programmes (batteries, e-waste, car seats), Love Food Hate Waste Campaigns, Waste Free Parenting/Period programmes, Love your Compost, Illegal Dumping reduction.	3	Facilitator	Waste Levy	Ongoing
14	Recycle, compost, anaerobic digestion Explore options for satellite Zero Waste/Recycling hubs in the District in collaboration with community groups, businesses, NGO's and other organisations.	4, 7	Partner	Waste Levy General Rates	Ongoing

#	Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
15	Recycle, compost, anaerobic digestion	Continue to support green waste diversion from landfill by composting or other methods.	1, 5	Partner	Waste Levy General Rates	Ongoing
16	Recycle, compost, anaerobic digestion	Explore options for diversion of biosolids from landfill, which may include vermicomposting, in-vessel composting in collaboration with the wastewater team.	1, 5	Provider, Partner	Waste Levy General Rates	Ongoing
Dispose						
17	Dispose	Continue aftercare of closed landfills, including alternate leachate treatment methods for Otaihanga, maintenance of wetlands, and planting of native trees.	9	Provider	General Rates	Ongoing

Porirua City Action Plan

#	Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
			Reduce, rethink, redesign			
1	Reduce, rethink, redesign	Connect communities, businesses, and industry to increase learning and drive commitment into waste reduction. Continue to support groups that already promote collective responsibility for our waste and our climate.	2, 3	Facilitator	Waste Levy	2024 - 2025 Onwards
2	Reduce, rethink, redesign	Collaborate on, provide, and support opportunities and initiatives for mana whenua to reduce waste on marae and exercise kaitiakitanga and protect the natural environment from the impacts of waste and material management.	2, 3, 5	Partner	General Rates Targeted Rates Waste Levy Other	Ongoing
3	Reduce, rethink, redesign	Support the delivery of programmes in Porirua which assist businesses to minimise waste throughout their production cycle.	1, 2, 3	Facilitator, Provider	Waste Levy Other	2023 - 2024 Onwards
4	Reduce, rethink, redesign	Embed waste minimisation practices, emissions reduction, and circular economy targets into Council procurement, policy, and services including when planning for and establishing waste management and minimisation services and infrastructure.	1, 2, 3, 5	Provider	General Rates Waste Levy	2024 - 2025 Onwards
5	Reduce, rethink, redesign	Advocate to and collaborate with central government to inform policy decisions and initiatives that will shape positive outcomes for waste reduction and reuse initiatives.	2	Advocate	General Rates Waste Levy	Ongoing
6	Reduce, rethink, redesign	Ensure governance systems, staff and resources are in place to implement the WMMP.	2	Provider	General Rates Waste Levy	Ongoing
7	Reduce, rethink, redesign	Implement, use, review and evaluate Council regulations including bylaws, compliance activities and enforcement to support behaviour and system change to minimise waste.	3, 6	Regulator	General Rates	Ongoing
8	Reduce, rethink, redesign	Work with partners, and internal/external stakeholders to simplify processes for establishing innovative circular businesses and initiatives. This includes actively supporting those already innovating and building in circular principles into their organisations and activities.	3, 4, 5	Regulator, Funder	General Rates Waste Levy	Ongoing
9	Reduce, rethink, redesign	Support through providing resources and tools for entrepreneurs, social enterprises, community groups and mana whenua to set up enterprises which support Porirua's transition to a circular economy.	3, 4	Facilitator	General Rates Waste Levy Other	2024 - 2025 Onwards

Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
10	Reduce, rethink, redesign	Explore pathways to a circular economy for Porirua over a long-term horizon. This includes a circular economy scan or developing a circular economy roadmap for Porirua.	Provider	General Rates Waste Levy Other	2027 - 2028 Onwards
11	Reduce, rethink, redesign	Support research and trials into solutions to prevent waste in collaboration with community groups, private industry and mana whenua.	Partner	Waste Levy Other	2024 - 2025
12	Reduce, rethink, redesign	Explore and assess emerging opportunities and innovation for reduction, reuse, recovery, recycling, treatment, and disposal of materials.	Partner	General rates Fees and Charges Waste Levy Other	Ongoing
13	Reduce, rethink, redesign	In collaboration with community groups, NGOs, businesses and other stakeholders, fund and allocate resources towards behaviour change programmes to minimise waste including in schools, our community, and businesses.	Funder	Waste Levy Other	Ongoing
Reuse, repair, repurpose					
14	Reuse, repair, repurpose	Improve the accessibility, outreach, and availability of information on waste management and minimisation and litter to a range of diverse communities in Porirua.	Facilitator	General Rates Targeted Rates Waste Levy	Ongoing
15	Reuse, repair, repurpose	Collaborate with partners to provide information, and coordinate options for material reuse, recovery and recycling to make it accessible for businesses, communities, and mana whenua.	Facilitator	General Rates Waste Levy	2023 - 2024 Onwards
16	Reuse, repair, repurpose	Collaborate with stakeholders including businesses, communities, and mana whenua to develop a resource recovery network in Porirua such as a community resource recovery park, construction and demolition facility, organic processing facility, repair cafes, tool libraries and community resource recovery hubs.	Facilitator	General rates Fees and Charges Waste Levy Other	Ongoing
17	Reuse, repair, repurpose	Provide grants and funding to support re-use, repurposing, and recycling capacity in Porirua City.	Funder	Waste Levy	2024 - 2025 Onwards
Recycle, compost, anaerobic digestion					
18	Recycle, compost, anaerobic digestion	Implement a waste data and licensing system in collaboration with central government.	Regulator	General Rates Fees and Charges	2024 - 2025 Onwards

#	Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
19	Recycle, compost, anaerobic digestion	Establish a data monitoring and reporting framework that supports Porirua to contribute to the measurement of Aotearoa achieving <i>Te rautaki para i Waste strategy</i> targets alongside the region to enable reporting to Porirua and Wellington region residents on the progress of the WMMP.	6	Regulator	General Rates	2024 - 2025 Onwards
20	Recycle, compost, anaerobic digestion	Work with community groups, partners and stakeholders to scale up interventions to divert and recover as much waste as possible.	4	Facilitator	Waste Levy Other	Ongoing
21	Recycle, compost, anaerobic digestion	Encourage the improvement of Material Recovery Facilities in the Wellington region by improving contracts. Consider the feasibility of establishing another Material Processing Facility in the Wellington region.	4, 5, 6	Partner	Targeted Rates Waste Levy Other	2024 – 2025 Onwards
22	Recycle, compost, anaerobic digestion	Review and improve kerbside waste collection services to ensure Porirua City has accessible, equitable, and convenient kerbside waste collection services. Prioritise the decarbonisation of kerbside contracts by embedding transport emission reduction targets into procurement processes.	4, 5, 6	Provider	General Rates Targeted Rates Other	Ongoing
23	Recycle, compost, anaerobic digestion	Provide for and implement organic kerbside collection and processing services to divert organic waste. Continue to work with community groups providing community composting projects.	1, 4, 5	Provider	General rates Targeted Rates Waste Levy Other	By 2030
Recover value						
24	Recover value	Maximise extraction and destruction of landfill gas and explore options for beneficial use of landfill gas from Spicer Landfill.	1	Provider	Fees and Charges Other	Ongoing
Dispose						
25	Dispose	Improve information and data collection on litter and illegal dumping. This could include expanding the number of monitoring sites, establishing actions to address litter and illegal dumping issues and implementing research and initiatives to prevent litter from entering public spaces and the environment in Porirua City.	6, 9	Provider	General Rates	Ongoing
26	Dispose	Collaborate with mana whenua, partners, businesses, and the community to deliver community and business litter prevention action plans.	9	Partner	Waste Levy Other	2023 – 2024 Onwards

Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
27	Dispose	Continuously improve and manage Spicer Landfill's service and operations.	Provider	Fees and Charges	Ongoing
28	Dispose	Investigate, consider, and where appropriate restrict materials entering Spicer Landfill where stable and viable alternatives exist for reuse, recovery, and recycling.	Regulator	Fees and Charges Waste Levy	2025 - 2026
29	Dispose	Plan for and manage emergency waste and collection services in Porirua, alongside our wider Wellington regional partners.	Provider	General Rates	Ongoing
30	Dispose	Investigate and deliver pricing and funding mechanisms which incentivises waste reduction and the recovery of materials.	Provider	General Rates Fees and Charges	2024 - 2025
31	Dispose	Investigate and consider long term disposal options for Porirua City alongside other councils in the Wellington region.	Partner	Fees and Charges	2027 - 2028 Onwards

Upper Hutt City Action Plan

#	Waste Hierarchy Level	Action	Reduce, rethink, redesign	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
1	Reduce, rethink, redesign	Work with mana whenua to support a Māori worldview approach to waste minimisation.	Provide resources and funding to education providers who educate the public on waste minimisation activities and circular economy principles.	All	Partner	Waste Levy	Ongoing
2	Reduce, rethink, redesign		Continue to provide support and funding to the community through the Environment and Waste Minimisation Fund.	3, 5	Funder	Waste Levy	Ongoing
3	Reduce, rethink, redesign		Facilitate and where possible collaborate with community groups and organisations to promote and undertake waste minimisation activities including but not limited to audits, processing and diversion.	2, 5	Funder	Waste Levy	Ongoing
4	Reduce, rethink, redesign		Administer, implement and review the Solid Waste Management and Minimisation Bylaw 2020 and compliance and enforcement activities to support behaviour and system change to minimise waste	3, 5	Facilitator	Waste Levy	Ongoing
5	Reduce, rethink, redesign		Ensure that local communication strategies are adequate to support the implementation of WMMP actions.	1, 2, 4, 5, 6, 8, 9	Facilitator, Regulator	Waste Levy	Ongoing
6	Reduce, rethink, redesign		Advocate to and collaborate with central government to inform policy decisions and initiatives for better waste outcomes and system changes for the residents and businesses of Upper Hutt City.	2, 3, 5	Provider	Waste Levy	2023-2024 onwards
7	Reduce, rethink, redesign		Support and deliver business programmes to assist businesses to minimise waste and implement circular economy principles.	2, 3, 5	Advocate	Waste Levy	Ongoing
8	Reduce, rethink, redesign		Embed waste minimisation practices and circular economy principles into Council facilities, procurement, policy, and services.	3, 5	Advocate	Waste Levy	2023-2024 onwards
9	Reduce, rethink, redesign		Ensure there are adequate staffing resources across the implementation of the WMMP.	All	Facilitator	Waste Levy	Ongoing
10	Reduce, rethink, redesign			All	Provider	Waste Levy General Rates	Ongoing

#	Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Reuse, repair, repurpose	
					Funding Options	Timeframe
11	Reuse, repair, repurpose	Where possible collaborate with and promote the use of repair and reuse organisations such as repair cafes, Menz Shed and EarthLink etc.	2, 3, 4, 5, 6	Facilitator	Waste Levy	Ongoing
12	Reuse, repair, repurpose	Consider, trial and pilot reusable initiatives such as reusable cups and serviceware systems.	3, 4, 5, 8	Facilitator	Waste Levy	2023-2024 onwards
Recycle, compost, anaerobic digestion						
13	Recycle, compost, anaerobic digestion	Investigate and implement Council kerbside services for standardised kerbside recycling and organics.	All	Provider, Facilitator, Funder	General Rates Waste Levy	By 2027 and 2030
14	Recycle, compost, anaerobic digestion	Support local and/or regional food scraps collection and processing.	1, 2, 3, 4, 5, 6, 8	Provider, Facilitator, Funder, Partner	General Rates Waste Levy	By 2030
15	Recycle, compost, anaerobic digestion	Support regional investigations into the establishment or improvement of regional infrastructure and services that minimise waste to landfill. This could include organic waste, C&D waste, materials recovery facilities, and a region wide resource recovery network.	2, 4, 8, 9	Partner	Waste Levy	2023-2024 onwards
16	Recycle, compost, anaerobic digestion	Promote and support waste minimisation at events and festivals through the implementation of the Solid Waste Management and Minimisation Bylaw 2020 and provide resources and information to increase diversion of recyclable material.	3, 4, 5	Facilitator, Regulator	Waste Levy	Ongoing
17	Recycle, compost, anaerobic digestion	Support the recovery of e-waste, through promotion, collection events and or drop-off facilities.	3, 4, 5	Facilitator	Waste Levy	2023-2024 onwards
18	Recycle, compost, anaerobic digestion	Ensure that the Recycling Station drop off facility has adequate resources to minimise contamination and increase recycling rates.	3, 4, 5, 6	Provider	Waste Levy	Ongoing
Dispose						
19	Dispose	Support through resources such as funding and communications, the domestic hazardous waste collection at the Silverstream landfill.	8, 9	Funder	Waste Levy	Ongoing
20	Dispose	Investigate, trial and support ways to reduce litter and illegal dumping in Upper Hutt.	2	Facilitator	Waste Levy	2023-2024 onwards

Wairarapa Joint Action Plan

#	Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
Reduce, rethink, redesign						
1	Reduce, rethink, redesign	Implement waste communication programmes for community outreach Extend existing communication programmes to focus on additional target audiences, such as retirees, new parents, businesses and less engaged sectors of the community. Focus on diverting waste, educate on the environmental impacts and assist with finding alternatives to households burning waste. Embed circular economy messaging into educational activities and communications. Develop a comms and educational plan to support the delivery of the waste communication programmes.	2, 3, 5	Partner, Facilitator	Waste Levy General rates	Ongoing
2	Reduce, rethink, redesign	Zero Waste and environmental sustainability education in schools Work with external providers to develop, trial and implement initiatives to support to schools (including ECE's) on waste minimisation, circular economy principles, and environmental sustainability practices.	3, 4	Partner, Facilitator, Funder	General Rates Waste levy	Ongoing
3	Reduce, rethink, redesign	Monitor to reduce use and disposal of hazardous materials Establish a process to record the amount of hazardous waste being disposed of in the region in collaboration with other councils in the Wellington region. To include private and Council contracted activities. Encourage reduced use of hazardous materials by promoting knowledge and awareness of alternatives to hazardous materials in the workplace and home. Coordinate collections for agricultural disposal with Agrecovery.	1, 2, 3, 4, 7, 8	Partner, Facilitator	Waste Levy Fees and Charges General Rates	Ongoing
4	Reduce, rethink, redesign	Advocate for waste product ownership Work with and advocate to central government on initiatives and legislation that promotes and develops circular economy principles to benefit communities, mana whenua and the environment.	2	Advocator	Waste Levy General rates	Ongoing
5	Reduce, rethink, redesign	Encouraging circular economy principles at community level	4, 8	Provider	Waste levy General rates	Ongoing

#	Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
		Investigate, consider, trial and implement initiatives that provide education and information on how we can embed circular economy principles at a community level. This will involve working with residents, local businesses and community groups to enable and encourage them to achieve a transition to a circular economy.				
6	Reduce, rethink, redesign	Implementing the WMMP Ensure we have enough resources/ staff to enable us to implement the actions of the WMMP and to assist the implementation of the plan both locally and regionally.	2	Provider	General Rates Waste levy	Ongoing
7	Reduce, rethink, redesign	Encouraging waste network opportunities Work with partners to investigate, trial and establish a network that provides information and advice for communities and businesses on opportunities to reuse, reduce and recycle within the region and beyond. Include website links, campaigns etc	2	Partner, Funder	General rates	Ongoing
8	Reduce, rethink, redesign	Investigate targeted waste streams Investigate, consider, trial and implement services for targeted waste streams that are not included in standard kerbside collections. This will include collaborating with local government organisations, non-governmental organisations and other key stakeholders to support Government regulated product stewardship schemes, as well as voluntary, industry-led product stewardship schemes that meet best practice.	1, 2, 4	Partner, Facilitator	Waste Levy	Ongoing
9	Reduce, rethink, redesign	Events led, Council supported waste management and minimisation Continue to support effective waste management at events and support and assist event organisers to reduce waste and work towards a circular economy.	2, 4	Partner	Waste Levy General Rates	Ongoing
10	Reduce, rethink, redesign	Business led; Council supported waste audits Investigate and implement waste audits that provide advice on waste reduction, recycling, carbon footprint and circular economy principles. Provide targeted, practical and resource-based support to aid businesses, NGOs and community groups to become more sustainable and implement circular business models.	2, 4, 6	Facilitator	Waste Levy General Rates	Ongoing
Reuse, repair, repurpose						

#	Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
11	Reuse, repair, repurpose	Support groups that promote diversion from landfill Work with and support community groups and the private sector to implement initiatives to support, promote and facilitate opportunities to divert materials and reusable items from landfill. Ensure initiatives are equipped to record material flow data to measure waste diverted from landfill.	4	Partner	Waste Levy Fees and Charges	Ongoing
12	Reuse, repair, repurpose	Divert construction and demolition waste Investigate, consider, trial and introduce solutions working with external parties to aid with the diversion of construction and demolition (C&D) waste. This could include audits of waste from C&D sites, working with planning teams to introduce site-specific waste management plans, embedding circular economy principles into planning policy, working with or providing C&D reuse sites regionally or locally.	1, 2, 3, 4, 5	Partner	General Rates Waste Levy Other	
Recycle, compost, anaerobic digestion						
13	Recycle, compost, anaerobic digestion	Options for an organic processing facility Investigate, and consider options for processing organic waste in the Wairarapa including community operated solutions, Wairarapa based or regional solutions. Consider working with external parties to implement.	1, 2, 4, 5	Partner	Waste Levy	2023 - 2024
14	Recycle, compost, anaerobic digestion	Investigate behaviour change systems for kerbside collections Ensure consistency with kerbside recycling collections, provide information on standard items allowed and monitor with audits and inspections. Investigate options for a three-strikes system for those not using kerbside recycling bins correctly so as to prevent contamination and increase diversion.	1, 3, 4, 5, 6	Provider	General Rates	Ongoing
15	Recycle, compost, anaerobic digestion	Establish organic food collection service Investigate, consider, trial and implement an organic kerbside collection for homes and businesses, also promote the benefits of home composting, and support community groups that are providing local solutions to food waste.	1, 3, 4	Provider	Waste Levy General Rates	By 2030
16	Recycle, compost, anaerobic digestion	Improve waste diversion facilities at landfill transfer stations	1, 3, 4, 5, 8, 9	Provider	General Rates Waste Levy	By 2026

#	Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
		Investigate, consider, trial and implement changes to the transfer and recycling stations to improve the facilities for waste diversion to reuse and recycling and make landfill a last resort stop.				
17	Recycle, compost, anaerobic digestion	Improve data collection on diverted materials Record the amount of material diverted to recycling each year. Investigate, consider, trial and implement changes to improve data collection and analysis for all wastes collected, to include but not limited to organics, hazardous, C&D. Investigate a licensing system in collaboration with other TA's and central government. Data collection could include SWAP analysis, waste assessments, audits of transfer stations, kerbside services.	5, 6	Provider, Partner	Fees and Charges General Rates	Ongoing
18	Recycle, compost, anaerobic digestion	Enable better waste diversion and collection in rural and coastal areas Investigate, consider, trial and implement initiatives to achieve better waste diversion in rural and coastal areas. Initiatives could include: • Providing extra collections in holiday areas during the busy season. Providing recycling facilities for visitors. • Facilitating collection, transportation and disposal of hazardous wastes and providing information on management of such wastes. • Ensuring recycling facilities are accessible within a 20-minute drive for 95% of the community. • Investigating potential level of service changes. Exploring options for extra satellite recycling hubs in coastal and rural areas.	3, 4, 5	Provider	General Rates Waste Levy	Ongoing
19	Recycle, compost, anaerobic digestion	Divert biosolids from landfill Work within the region and beyond to explore options to divert biosolids from landfill. Collaborate with mana whenua to find the best solution to biosolids.	1, 9	Provider	General Rates	Ongoing
20	Recycle, compost, anaerobic digestion	Improve signage at landfill transfer stations Improve signage at landfill transfer stations to enable clear and consistent instructions to users.	3, 4, 5	Provider	Waste Levy General Rates	2023 - 2024
Dispose						

Ngā mahere mahi | Action plans

#	Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
21	Dispose	Reduce litter and illegal dumping Investigate ways to: • reduce litter and illegal dumping, • report on volume of litter and illegally dumped items to public, and • educate public on the harm litter causes to the environment.	2	Provider	Waste Levy General Rates	Ongoing
22	Dispose	Monitoring and implementing landfill transfer station management plans Develop and implement, comply and regularly revise management plans for each facility, prepare aftercare plan for closed landfills to include monitoring and testing as per resource consents.	9	Provider	General Rates	Ongoing

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Wellington City Action Plan

#	Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
Reduce, rethink, redesign						
1	Reduce, rethink, redesign	Deliver the benefits of reuse, repair and waste prevention through active use of Council regulations, compliance activities and enforcement.	1, 2, 4	Provider, Regulator	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing
2	Reduce, rethink, redesign	Deliver lasting behaviour change interventions by educating our community to understand the benefits of change and then helping them make that long term change easy as we work towards zero waste.	1, 2, 3, 5	Provider	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing
3	Reduce, rethink, redesign	Work with mana whenua partners and other stakeholders to give individuals courage to make a change in the world and inspiring them to reduce waste and live a more sustainable life.	1, 2, 3, 4	Provider, Partner, Facilitator	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing
4	Reduce, rethink, redesign	Work with central government agencies to inform and shape system changes. Advocate for policies and initiatives at central government level that will inform and shape positive outcomes for reuse and waste reduction initiatives.	2, 4, 5	Advocate	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing
5	Reduce, rethink, redesign	Work with mana whenua partners and other stakeholders to transform Wellingtonians' relationship with packaging and reusables to align more closely to the waste hierarchy.	1, 2, 3, 4	Facilitator	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing
6	Reduce, rethink, redesign	Work with mana whenua partners and other stakeholders to support the redesign of systems.	2, 3, 4, 5	Partner, Provider	General Rates Targeted rates Waste Levy	Ongoing

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Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
				Fees and Charges Other	
7	Reduce, rethink, redesign	Support and encourage businesses, social enterprises, community organisations and charities to provide services and create local and regional markets for waste products and materials.	Facilitator, Provider, Advocate	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing
Reuse, repair, repurpose					
8	Reuse, repair, repurpose	Support the provision of consistent, equitable and accessible collection services, drop off points and community zero waste hubs.	Provider, Partner	General Rates Targeted rates Waste Levy Fees and Charges Other	2027 - 2028
9	Reuse, repair, repurpose	Support Wellington's reuse, repair and recycling capacity by acting as a catalyst for other investment.	Provider	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing
10	Reuse, repair, repurpose	Deliver value for money and effective waste services to Wellingtonians.	Provider, Partner	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing
11	Reuse, repair, repurpose	Deliver sustainable waste services to Wellingtonians.	Provider	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing
12	Reuse, repair, repurpose	Encourage innovation to support delivery of Wellington's transition to a zero waste future.	Provider	General Rates Targeted rates	Ongoing

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Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
				Waste Levy Fees and Charges Other	
13	Reuse, repair, repurpose	Monitor and evaluate waste streams to support effective policy making and insights.	Provider	General Rates Targeted rates Waste Levy Fees and Charges Other	2024-2025 and onwards
14	Reuse, repair, repurpose	Deliver lasting behaviour change interventions by making people understand the benefits of change and then help them make that long term change easy.	Provider	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing
15	Reuse, repair, repurpose	Work with central government agencies to inform and shape system changes.	Advocate	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing
16	Reuse, repair, repurpose	Promote and encourage the reuse of materials for the same purpose and recover materials so that they can be re-used throughout Wellington.	Partner	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing
17	Reuse, repair, repurpose	Increase the amount of material that is recovered, reused and recycled to minimise waste and reduce the amount of virgin materials used in production.	Funder	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing

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#	Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
18	Reuse, repair, repurpose	Work with mana whenua partners and other stakeholders to scale up interventions that support the citywide goal to be a leader in minimising the use of resources and maximising resource reuse and recovery.	2, 3, 4, 5	Facilitator, Provider, Regulator	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing
Recycle, compost, anaerobic digestion, Recover value						
19	Recycle, compost, anaerobic digestion Recover value	Support the provision of consistent, equitable and accessible kerbside collection services, drop-off points and community zero waste hubs for Wellingtonians.	2, 3, 4, 5	Provider	General Rates Targeted rates Waste Levy User Charges Other	2026 - 2027
20	Recycle, compost, anaerobic digestion Recover value	Work together with households, producers, collectors and reproducers to extract the maximum value possible from food that would otherwise be wasted.	1, 2, 3	Partner, Provider	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing and implement by 2030
21	Recycle, compost, anaerobic digestion Recover value	Implement a complementary kerbside organic collection and processing service to produce nutrient rich products from organic waste that can be applied to soil and/or generate energy, depending on the technology selected.	1, 4, 5	Provider	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing and implement by 2030
22	Recycle, compost, anaerobic digestion Recover value	Promote and encourage the reuse of materials for the same purpose and recover materials so that they can be reused throughout Wellington.	1, 3, 4, 5	Partner	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing
23	Recycle, compost, anaerobic digestion Recover value	Work with mana whenua partners and other stakeholders to scale up interventions to support the citywide goal to be a leader in minimising the use of resources and maximisation of reuse and recovery.	2, 3, 5	Partner	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing

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#	Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options	Timeframe
24	Recycle, compost, anaerobic digestion Recover value	Create a waste ecosystem that demands and influences the right behaviours for desired outcomes.	3, 4, 5	Provider	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing
25	Recycle, compost, anaerobic digestion Recover value	Support the creation of markets for secondary materials.	2, 3, 4, 6	Facilitator, Provider	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing
Disposal						
26	Dispose	Safely manage the treatment and disposal of sludge.	1, 4, 8, 9	Provider	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing and Implement by 2025 - 2026
27	Dispose	Provide for and manage emergency waste.	6, 7, 8, 9	Provider	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing
28	Dispose	Continue ongoing management of the Southern landfill and Wellington's closed landfills to support Wellington's transition to a zero-waste city.	1, 8, 9	Provider	General Rates Targeted rates Waste Levy Fees and Charges Other	Ongoing
29	Dispose	Work with mana whenua partners and other stakeholders to scale up interventions to recover and divert as much waste from landfill and ensure that any remaining waste is appropriately managed at Southern landfill to protect our environment.	2, 3, 4, 5, 8, 9	Partner, Provider	General Rates Targeted rates Waste Levy Fees and Charges	Ongoing

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#	Waste Hierarchy Level	Action	Alignment with Objectives	Primary Role of Council	Funding Options		Timeframe
					Other		

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7 Te utu i tēnei WMMP | Funding this WMMP

Section 43 of the Waste Minimisation Act 2008 (WMA) requires that councils provide information about how they will fund the implementation of this WMMP. The actions set out in this WMMP will be funded using the suite of sources and options available to the Councils in the delivery of waste management and minimisation services and activities, including:

- **General Rates:** A charge paid by all ratepayers.
- **Targeted Rates:** Charges applied to properties receiving specific council services.
- **Fees and Charges:** Fees and charges for user-pays collections, gate fees at landfills and transfer stations and regulatory fees (e.g., licensing fees).
- **Waste Levy:** The Government currently redistributes 50% of the levy funds from the waste disposal levy on a per capita basis to councils for this to be used for waste minimisation activities²⁴.
- **Other:** Councils can apply for funds from central government including the waste minimisation fund or other funds related to reducing waste and waste related emissions. There may also be other funding mechanisms such as lease revenue, and private sector funding where the private sector may invest in, be part of a partnership or supply waste minimisation initiatives.

This WMMP identifies the potential funding sources for each action, as outlined in the Action Plan tables in Section 6.

Budgets to implement the actions outlined in Section 6 will be carefully developed as part of the region's Annual Plan and Long-term Plan (LTP) processes. This approach aims to implement as many actions as possible while controlling costs and seeking cost savings where possible.

For the waste levy, each of the Councils currently receives a share from the Ministry for the Environment, based on a per capita basis. Prior to 2022, the rate was set at \$10 per tonne, but this has since increased to \$50 per tonne as of 1 July 2023. It is set for one further increase to \$60 per tonne by 1 July 2024.

The waste levy must be "*spent on matters to promote waste minimisation and in accordance with their WMMP*". Waste levy funds can be spent on ongoing waste minimisation services, new services, or an expansion of existing services. The funding can be used for education and communication, policy research and reporting, to provide grants, or as infrastructure capital, and other activities in this WMMP.

The Councils intend to predominantly use their waste levy funds for a range of waste minimisation activities and services. The Councils may also use other funds available to them, or they can make an application to the Ministry for the Environment's contestable Waste Minimisation Fund, either separately, collectively with other councils, or with another party. The contestable Waste Minimisation Fund provides additional funds for new initiatives or a significant expansion of existing activities.

Section 47 of the WMA gives councils the ability to give grants to a person, organisation, or group to promote or achieve waste management and minimisation. Under this WMMP, individual Councils within the Wellington region can continue to give grants at its discretion and on any terms or condition it deems appropriate, provided there is an allocated and approved budget for that activity.

²⁴ As discussed in section 3.1, central government is currently reviewing the distribution of the waste disposal levy in their reform of the Waste Minimisation Act 2008 and Litter Act 1979

8 Te ine i te anga whakamua | Measuring progress

This WMMP is a key part of the Wellington region's move towards a circular economy, where we keep resources in use for as long as possible. This WMMP includes a set of detailed Regional and Local Action Plans for the Councils to achieve in collaboration with our partners and a wide range of stakeholders. To support these action plans, detailed implementation plans will be developed both locally and regionally and will provide detailed information on "how" the actions plans will be delivered. This enables Councils to provide greater detail to the Wellington Regional Waste Management and Minimisation Joint Committee (Joint Committee), and the Wellington region, on how the targets, objectives and actions will be achieved. For clarity, the implementation plans will contain the milestones, projects, initiatives, and timeframes that sit under the action plans in more granular detail. The plans will describe the necessary steps for executing each regional and/or local action, including the teams and resources that will be required. While there is no one-size-fits all, the anticipated core components of the implementation plan that will be further developed to give effect to this WMMP will include success criteria measures, plan of project outputs, resourcing and milestones, key performance indicators (KPIs) and timelines.

Further, the targets set out in this WMMP are one of the ways that progress will be measured to achieve the vision and objectives and ensure accountability as part of delivering this WMMP. Milestones will be a critical component underneath the targets, to enable Councils to track, measure and report on progress against the targets. This is particularly important given possible regulatory changes being considered by central government (e.g., the introduction of nationwide kerbside collection of food scraps to all urban households by 2030 which is anticipated to require adequate enforcement resource to ensure compliance).

Collectively as a region, the Councils will monitor, evaluate, and report on progress against the targets and regional actions on an annual basis. Progress will be reported to Joint Committee overseeing this WMMP which will be made available to the public via Wellington City Council's website and/or via a joint website. The reporting will include a summary of progress and activities undertaken from the Regional Action Plan and will identify where unforeseen or emerging issues need to be addressed and where success has been achieved, through for example, project achievements. In addition to the annual reporting, a more comprehensive report reviewing progress towards the targets, objectives and vision of the WMMP will be provided to the Joint Committee in 2026. In addition, councils will report progress against their respective local action plans to their individual committees at agreed time intervals, the results of which will also be made available to the public.

The Councils must also provide progress reports of expenditure of their waste levy funds to the Ministry for the Environment, alongside the waste diversion rates achieved as a result of this funding.

However, as highlighted in Section 3.5 of this WMMP, the way the region's waste data is collected is difficult due to the large number of private and public waste services and facilities across the Wellington region. This has historically resulted in inconsistent monitoring and reporting of waste data. For the purposes of measuring progress for the actions presented alongside this WMMP, the 2021/22 waste data from the WRWA will be used as a baseline, with the understanding that data accuracy is likely to improve over the duration of this WMMP.

Moving forward, the Councils will focus on their data collection, monitoring and reporting for the waste streams, services, and facilities that it can control. Councils will also work on obtaining information from activities in the upper levels of the waste hierarchy and waste generation so that progress towards objectives and targets can be determined. Data will be gathered through a variety of mechanisms including community satisfaction surveys, Wellington region records (e.g., call centre records, KPIs, etc.), licensing and data requirements, contractors, and Solid Waste Assessment Protocol (SWAP). The Councils will also give effect to any national data collection and reporting requirements that are mandated by central government and

engage with the upcoming National Waste Data Framework development process to represent the needs and priorities of the Councils, Wellington region businesses and communities.

9 Glossary of terms and abbreviations

Terms	Definition
Action and Investment Plan (AIP)	An Action and Investment Plan is a supporting plan developed by the Government that will provide detail on what is needed to deliver on <i>Te rautaki para Waste strategy</i> . <i>Te rautaki para Waste strategy</i> and AIP governs planning and activity across central and local government. The Government prepares a new AIP roughly every five years.
Construction and demolition waste (C&D)	Waste generated from any building work (including construction, renovation, repair or demolition); and includes but is not limited to concrete, plasterboard, insulation, nails, wood, steel, brick, paper, roofing materials, wool/textiles, cardboard, metals, plastic or glass, as well as any waste originating from site preparation, such as dredging materials, tree stumps, asphalt and rubble. Abbreviated to C&D waste throughout this WWMP.
Circular economy	In a circular economy, waste and pollution is designed out, resources are kept in use for as long as possible, then recovered and regenerated into new products and materials at the end of their lifecycle. Protecting and regenerating natural systems is key to a circular economy, as is delivering equitable and inclusive outcomes.
Class 1 Landfill	A Class 1 landfill is a site that accepts domestic solid waste. A Class 1 landfill generally also accepts construction and demolition waste, some industrial wastes and contaminated soils.
Class 2 Landfill	A Class 2 landfill is a site that accepts non-putrescible wastes including constructions and demolition wastes, inert industrial wastes, managed fill material and clean fill material.
Cleanfill	A cleanfill (properly referred to as a Class 4 landfill) is any disposal facility that accepts only material that, when buried, will have no adverse environmental effect on people or the environment.
Councils	The eight city and district councils in the Wellington region who have produced this plan: Carterton District Council, Hutt City Council, Kāpiti Coast District Council, Porirua City Council, South Wairarapa District Council, Upper Hutt City Council and Wellington City Council.
Dispose or Disposal	The final (or more than short-term) deposit of waste into or onto land set apart for that purpose, or the incineration of waste.
Diverted material	As defined within the Waste Minimisation Act 2008, means anything that is no longer required for its original purpose and, but for commercial or other waste minimisation activities, would be disposed of or discarded.
Domestic waste	Waste consisting of refuse, recyclable material, or organic matter (food waste and/ or garden waste) originating from any household or from the cafeteria, lunchroom or canteen of any commercial enterprise but does not include, commercial or industrial waste, prohibited waste, hazardous waste, trade waste, liquid waste, or construction and demolition waste.
Emissions Trading Scheme	One of the government's tools for reducing greenhouse gas emissions. Its purpose is to help meet international obligations under the Paris Agreement, and the 2050 target and emissions budgets for Aotearoa.
Food scraps	Any food scraps, such as from preparing meals, leftovers, scraps, and coffee grounds.
GWRC	Greater Wellington Regional Council

Green waste	Compostable plant material including lawn clippings, weeds, plants, and other soft vegetable matter, which by nature or condition, and being free of any contaminants will degenerate into compost. This does not include flax, bamboo, pampas, flowering gorse, palm trees or cabbage trees.
Hazardous waste	Waste that is reasonably likely to be or contain a substance that meets one or more of the classification criteria for substances with explosive, flammable, oxidising, toxic, corrosive or ecotoxic properties under the Hazardous Substances (Classification) Notice 2017. Hazardous waste does not include domestic waste, inorganic material, construction and demolition waste, or commercial or industrial waste.
KPI	Key Performance Indicator
Landfill	A disposal facility as defined in section 7 of the Waste Minimisation Act 2008, excluding incineration. Includes, by definition in the Waste Minimisation Act 2008 only those facilities that accept 'household waste'. Properly referred to as a Class 1 landfill.
LTP	Long-Term Plan
Managed fill	A disposal site requiring a resource consent to accept well-defined types of non-household waste, e.g., low-level contaminated soils, or industrial by-products, such as sewage by-products. Properly referred to as a Class 3 landfill.
Ministry for the Environment	The Ministry for the Environment is the public service department of New Zealand charged with advising the New Zealand government on policies and issues affecting the environment, in addition to the relevant environmental laws and standards.
Materials Recovery Facility (MRF)	A Materials Recovery Facility receives, separates, and prepares recyclables such as plastics, paper, cardboard, aluminium, and tins to be sold to an end buyer. The Materials Recovery Facility uses a combination of equipment, machines, and manual labour to separate and prepare the materials.
NGO	Non-Governmental Organisation
OECD	Organisation for Economic Co-operation and Development
Organic waste	Organic waste is biodegradable matter, such as food scraps, garden cuttings, grass, and branches, that can be accepted at an organics processing facility. In the context of this WMMP, biosolids is excluded from this definition.
Recovery	As defined in the Waste Minimisation Act 2008: a) Means extraction of materials or energy from waste or diverted material for further use or processing; and b) Includes making waste or diverted material into compost.
Recycling	The reprocessing of waste or diverted material to produce new materials.
Reduction	As defined in the Waste Minimisation Act 2008, means: a) Lessening waste generation, including by using products more efficiently or by redesigning products; and b) In relation to a product, lessening waste generation in relation to the product.
Reuse	As defined in the Waste Minimisation Act 2008, means the further use of waste or diverted material in its existing form for the original purpose of the materials or products that constitute the waste or diverted material, or for a similar purpose.
Resource recovery facility	A resource recovery facility is the co-location of infrastructure used for the easy separation and recovery of resources, including reuse and recycling. The extent to which there is any further onsite processing is a function of what if any activities could occur due to zoning and space constraints (e.g., recovery of

	furniture may be acceptable but the establishment of a concrete crushing facility may not be acceptable).
Solid waste	Waste resulting from industrial, commercial, mining, and agricultural operations, and from domestic activities. Includes sludge from a wastewater treatment plant, water supply treatment plant and other discarded material.
Solid Waste Assessment Protocol (SWAP)	A classification and sampling technique to measure the quantity and composition of waste. Solid Waste Assessment Protocols (SWAP) can be carried out for kerbside collections or at transfer stations and landfills.
Te rautaki para waste strategy	Te rautaki para Waste strategy 2023 has been prepared by the Ministry for the Environment. It provides a high-level road map out to 2050 of how New Zealanders are tracking to transform how waste is generated and managed in Aotearoa.
TA	Territorial Authority
Transfer station	Where different types of waste can be deposited by the public or commercial operators to be sorted and transported for recycling, reprocessing or landfill.
Treatment	Subjecting waste to any physical, biological, or chemical process to change its volume or character so that it may be disposed of with no or reduced adverse effect on the environment but does not include the dilution of waste.
Waste	As defined in the Waste Minimisation Act 2008 (WMA), waste means: a) anything disposed of or discarded; and b) includes a type of waste that is defined by its composition or source (for example, organic waste, electronic waste, or construction and demolition waste); and to avoid doubt, includes any component or element of diverted material, if the component or element is disposed or discarded.
Wellington Region Waste Assessment 2023 (WRWA)	A document summarising the current situation of waste management in the Wellington region. Abbreviated to the Waste Assessment throughout this WMMP.
Te pūnaha whakarōpū para The waste hierarchy	A list of waste management options with decreasing priority – usually shown as 'reduce, reuse, recycle, reprocess, treat, dispose'.
Waste Minimisation Act 2008 (WMA)	An act administered by the Ministry for the Environment to encourage a reduction in the amount of waste we generate and dispose of in New Zealand. The aim is to reduce the environmental harm of waste and provide economic, social and cultural benefits for New Zealand. Referred to as the WMA.
Waste Management and Minimisation Plan (WMMP)	City and district councils are responsible for promoting effective and efficient waste management and minimisation within their district. The WMA requires councils to adopt a Waste Management and Minimisation Plan as defined by section 43 of the WMA, which must be reviewed every six years.
Zero waste	A philosophy for waste management, focusing on council/community partnerships, local economic development, and viewing waste as a resource. Zero waste may also be a target.
CRRC	Community Resource Recovery Centres

10 Glossary of Māori kupu

Terms	Definition
Hāpu	A tribe or sub-tribe, consisting of a number of whānau sharing descent from a common ancestor
Iwi	An extended tribe that is typically used to refer to a large group of people descended from a common ancestor and associated with a distinct territory
Mana whenua	Those who exercise customary authority or rangatiratanga over land or territory (chieftainship or decision-making rights).
Kaitiaki	Guardian/caregiver/steward
Kaitiakitanga	Guardianship/stewardship/protection of the environment
Mātauranga Māori	Māori knowledge or wisdom
Papatūānuku	The earth mother
Taiao	Earth, the natural environment
Te Ao Māori	The Māori world view
Te Tiriti o Waitangi	The Treaty of Waitangi
Tikanga	Customary values and practices



Climate Change and Sustainability Committee

08 February 2024

Report no: CCASC2024/1/14

Update on solid waste and waste minimisation matters

Purpose of Report

1. To provide the Committee with an update on various solid waste management and minimisation matters.

Recommendation

That the Committee receives and notes the update on various solid waste management and minimisation matters.

Background

2. This report consolidates information on the status of Council's solid waste management and minimisation initiatives.
3. Detailed and regular information on the ongoing development, operation and performance of the Silverstream Landfill is covered in a separate report to the Hutt Valley Services Committee. The latest report from November 2023 is [available online](#) (page 63).

Wellington Region Waste Management and Minimisation Plan (WMMP)

4. On 12 December 2023, Council adopted the [WMMP 2023-2029](#) (refer to page 13).
5. Detailed planning for implementing WMMP is now underway, this is being developed jointly by officers of the Wellington region councils. A draft implementation plan is scheduled to be considered by the Wellington Region Joint Committee in March 2024.
6. In parallel, Council officers have begun work on two projects that were signaled in both the Regional Action Plan and our local action plan.

Stormwater treatment technology trial

7. In 2018/19, [a report by the Wellington Institute of Technology \(Weltec\)](#) estimated that approximately 22 tonnes of litter enters Lower Hutt's stormwater network annually.

8. It is assumed that most of this litter is discharged into our natural waterways, and some of this ends up back on our beaches. Monitoring by Sustainable Coastlines [found that in 2022](#) Lower Hutt's beaches had an average litter count of approximately 1,000 items per square metre compared to a Wellington Harbour average of approximately 200 and the New Zealand average of 250 items per square metre.
9. While the work in 2018/19 involved the trial of two technologies to prevent litter from entering our waterways (end-of-pipe net, and in-sump litter trap), these had various drawbacks – including the need to customise each installation and increased opex costs due to the need for frequent servicing. However, officers were made aware of an alternative technology solution, which is successfully used in Taupō [to reduce the discharge of contaminants into Lake Taupō](#). Hence, in 2023, officers began investigating the potential for a trial of that technology solution in Lower Hutt, with the support of Wellington Water Limited. Officers will keep Council updated on progress.

Construction and demolition waste plans

10. In 2022, a [waste assessment](#) at Silverstream Landfill found that construction and demolition waste ("C+D waste") made up approximately 17% of all waste entering the landfill. This figure is expected to be proportionally greater now given the recent increase in development activity, such as the construction of multi-unit developments.
11. [Hutt City Council's Solid Waste Management and Minimisation Bylaw 2021](#), requires that any person that is applying for a building consent for building work with an estimated value of \$2 million or higher to submit a construction site and demolition waste management plan to Council for approval prior to the commencement of any building work.
12. The policy is intended to ensure that developers appropriately manage and, where possible, reduce each type of waste and has in place measures to minimise and capture litter associated with the project and/or building work.
13. Due to resourcing constraints, it has not been possible to implement this policy until now. However, officers are now scoping out how best to implement these requirements to achieve the objective of the policy while minimising compliance costs for businesses and other stakeholders.
14. Note that this work programme has linkages to the projects under way at Silverstream transfer station to maximise resource recovery.

Food and green organics (FOGO) processing and kerbside collections

15. The potential implementation of a new FOGO service will be consulted on as part of the new draft Long Term Plan.
16. In parallel, officers have submitted funding applications to the Ministry for the Environment regarding funding support toward the implementation of the kerbside collection service and the development of a regional processing facility.

17. Wellington City Council, on behalf of the three participating councils, is leading the procurement for the regional processing facility. A Request for Information (RFI) was released on 27 November 2023 and closed on 5 February 2024. Evaluation of the RFI is currently underway. The next market engagement and procurement stage is the Registration of Interest phase, which will commence in late February 2024.

Resource recovery changes at Silverstream transfer station

18. The project to construct a new resource recovery shelter for Earthlink is now complete, see image below.



19. The focus is now shifting to how we can maximise diversion, and officers in cooperation with Waste Management NZ and Earthlink undertook a “diversion scrum” on 25 January 2024. The objective was to engage with all customers coming to the transfer station that day, inform them of the potential to receive a landfill discount if they divert products and materials, and assist them in diverting the material (eg by identifying materials of value, helping unload, etc).
20. The results of the scrum were as follows:
- 51 discount vouchers were given out on the day, based on about 80 engagements. This compares to about 1-2 vouchers handed out on a typical day.
 - For those customers that were able to divert material from their loads, typical diversion rates varied between 10 and 50%, with an average rate of about 20%.

- c. An estimated 2.7 tonnes of waste were diverted on the day (excluding green waste waste). This represents almost 10% of the typical daily tonnage through the transfer station. If this level of diversion could be achieved every day, then potentially about 1,000t of material and products could be diverted per year.
21. The exercise demonstrates that significantly more diversion can be achieved by directly engaging with customers and actively encouraging them to divert products and materials. Discussions are now underway with Waste Management NZ and Earthlink to explore how the current operating model can be shifted to a more engagement-focused operating model, in order to lock in higher diversion rates going forward.

Diversion of construction and demolition waste

22. Work with Waste Management on the collection and diversion of some construction and demolition (C&D) wastes, such as treated timber and plasterboard, continues. Now that the Earthlink shelter is complete, Waste Management is planning to set up drop-off bays for timber and tyres as a trial to assist with diversion. Appropriate material diverted into these bays will qualify for the transfer station discount voucher.
23. Officers are also working with Tonkin and Taylor on a research project to assess the potential of H1.2 hazard class timber to be chipped and used as mulch. Assessment of the concentrations and effects of boric salts in the soil are currently being carried out in small field trials in Christchurch. As this class of timber makes up the majority of timber framing and offcuts from the construction industry, any means of keeping it out of landfills is highly desirable.
24. Contaminated soil has recently become a significant contributor to waste disposed of at Silverstream Landfill due to the number of large infrastructure projects within the Wellington Region and beyond. Officers have been liaising with Environmental Destruction (New Zealand) Ltd (EDL) about trialing a new soil remediation technology at the Landfill. If confirmed, the trial will likely occur mid-2024 and run for approximately 6-12 months with EDL sharing the results of the trial with officers.

Kerbside rubbish and recycling service

City-wide recycling contamination and behaviour change

25. As reported previously, in the context of the roll out of an education campaign and the implementation of the bin removal process following repeated bin contamination, contamination reduced. However, over the past six months, bin contamination has remained relatively stable, fluctuating between 12.8% and 16.5%. These fluctuations underscore the dynamic nature of contamination levels and highlight the ongoing need for initiatives to address and alleviate variations in recycling practices.
26. Informational flyers are distributed in suburbs where contamination rates exceed 30% to align with budget constraints.

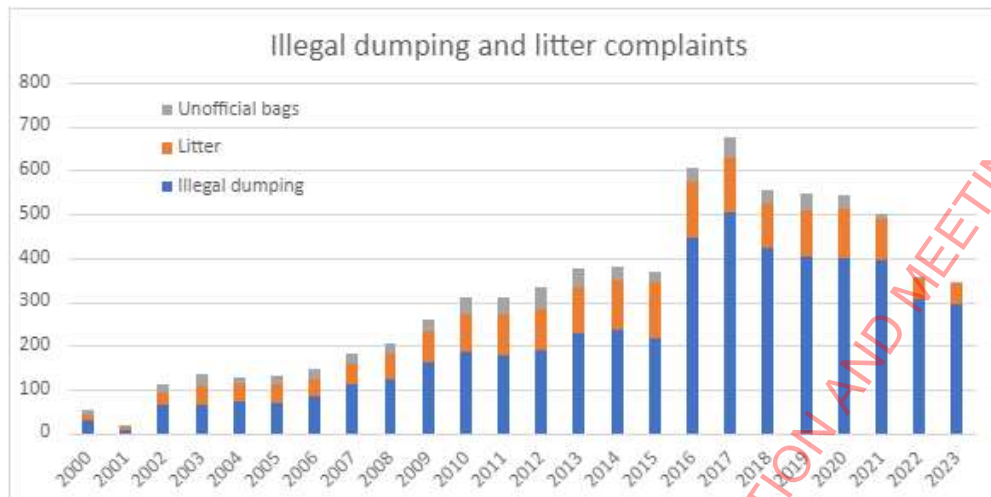
27. Officers have also engaged VML&R to carry out Phase 2 of the contamination behaviour change campaign. Phase 2 got underway in the context of the Christmas/New Year period, with further work scheduled over the next few months.
28. The bin removal scheme for households with repeated contamination instances has led to the removal of about 238 recycling bins since its implementation in November 2022. However, officers have identified various inefficiencies regarding bin inspectors' revisits of red-stickered bins, and officers will be working to reduce these inefficiencies over the next three months.



29. A revised 'Too Good To Waste' recycling booklet and the 2024 collection calendar was posted to all households to ensure they have all the relevant information to recycle right and to minimise their waste where possible.

Litter and illegal dumping behaviour statistics

30. As reporting previously, officers have been scoping out a potential city-wide anti-litter and illegal dumping reduction work programme that could consist of multiple projects running in parallel.
31. A key aspect of this is also to improve the data we collect regarding litter and illegal dumping. Statistics on the number of illegal dumping and litter complaints have now been compiled, covering the period since 2000, see below figure.



32. In addition, while only available for the last four years, data has been compiled on the total number of illegal dumping and litter incidents, which includes complaints but also clean-ups carried out by contractors that were not associated with a complaint.



33. Observations and assumptions:

- d. The step change and increase in complaints in 2016 is likely due to introducing a new reporting system Report a Problem (iRap/RAP) at the time.
- e. The step change and reduction in complaints in 2022 may be linked to the introduction of the new rubbish and recycling bin service in 2021, which also reduced the number of "unofficial bags" incidents.
- f. Making a complaint is also subject to how motivated a person is to make complaints; it may not reflect the actual number of incidents. Notably, the number of contractor clean-ups not associated with a complaint

increased between 2020 and 2023, when the number of complaints reduced.

- g. Awareness about how to make a complaint may be a factor in the period prior to 2013, as it increased, the number of complaints increased as well (again, this does not necessarily indicate the true number of incidents).

Climate Change Impact and Considerations

- 34. The matters addressed in this report have been considered in accordance with the process set out in Council's Climate Change Considerations Guide.
- 35. Minimising waste, diverting recyclables from landfill and recovering reusable materials (such as the potential addition of C&D diversion opportunities, diverting biosolids, etc.) contribute to a more circular economy. These activities reduce the need to extract further resources from the environment and the associated energy use in doing so.

Consultation

- 36. Not applicable

Legal Considerations

- 37. Not applicable

Financial Considerations

- 38. There are no current financial considerations in terms of decisions for Council, however the following items have potential financial impacts in the future:
 - h. improvements to the Silverstream transfer station (eg Earthlink resource recovery drop off, potential addition of C&D diversion opportunities) and participation in the Tyrewise scheme have the potential to divert an increased amount of material from the Silverstream Landfill. A reduction in waste to landfill involves a short-term decrease in landfill revenue to Council but a long-term reduction in capital expenditure due to extending the capacity and life of the landfill.
 - i. reducing kerbside recycling contamination has a direct benefit on the cost under contract for this service as any contamination rates under 10% do not incur penalty fees for Council.
 - j. reducing illegal dumping and littering would reduce the cost to Council to collect and dispose of this waste.

Appendices

There are no appendices for this report.

Author: Geoff Roberts
Manager Solid Waste

Author: Jörn Scherzer
Head of Climate and Solid Waste

Approved By: Alison Geddes
Director Environment and Sustainability

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Climate Change and Sustainability Committee

02 April 2024

Report no: CCASC2024/2/81

Update on solid waste and waste minimisation matters

Purpose of Report

1. To provide the Committee with an update on various solid waste management and minimisation matters.

Recommendation

That the Committee receives and notes the update on various solid waste management and minimisation matters.

Background

2. This report consolidates information on the status of Council's solid waste management and minimisation initiatives.
3. Detailed and regular information on the ongoing development, operation and performance of the Silverstream Landfill is covered in a separate report to the Hutt Valley Services Committee. The latest report from March 2024 is available online (page 32).

Wellington Region Waste Management and Minimisation Plan (WMMP)

4. Development of the WMMP implementation plan by officers of the Wellington region councils is underway. Multiple upcoming workshops with the Project Steering Group have been scheduled, including with the Joint Committee in May.
5. A draft implementation plan is scheduled to be presented to the Wellington Region Joint Committee on 10 June 2024.
6. Council's implementation planning for our Local Action Plan is also underway and will be complete in line with the regional plan by June 2024.

Diversion of construction and demolition (C&D) waste

7. Officers have begun building a partnership with Civilshare in order to promote Civilshare to the Lower Hutt construction community. Civilshare is an established community marketplace app that deals with C&D waste and is already operating successfully, primarily in Auckland. Civilshare connects construction companies and suppliers with others in the industry to maximise the reuse of resources that would otherwise be sent to landfill.
8. Waste Management is still working on identifying cost effective alternatives to landfill disposal for treated and untreated timber. We expect to have some options provided by them within the coming months so that timber collection and diversion can begin at the transfer station.

Food and green organics (FOGO) processing and kerbside collections

9. The potential implementation of a new FOGO service is being consulted on as part of the new draft Long Term Plan.
10. Officers continue to be in discussions with the Ministry for the Environment (MfE) regarding potential funding toward the roll out of kerbside FOGO collections, and a processing solution.
11. Procurement for the processing solution is being led by Wellington City Council on behalf of the three participating councils. The figures attached as Appendix 1 and Appendix 2 show the process and the procurement schedule.

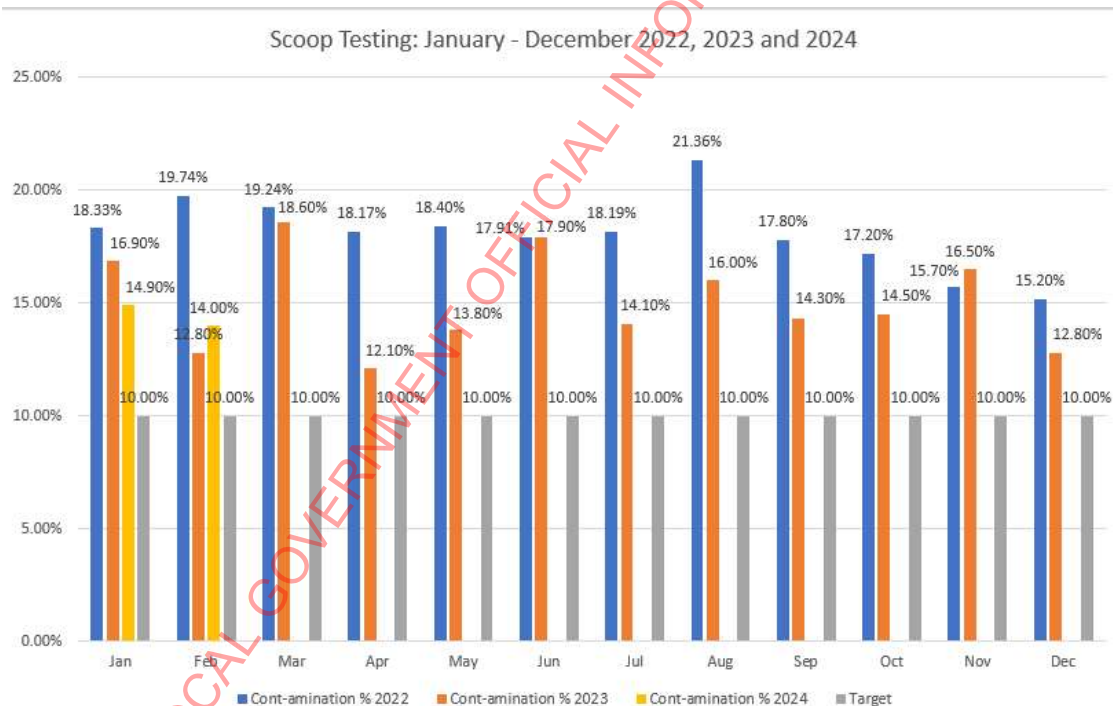
Resource recovery changes at Silverstream transfer station

12. Subsequent to the success of the diversion scrub day at the transfer station (refer to the waste minimisation update in February 2024 to this committee), officers have been working with Earthlink on a revised operating model. Operational changes are expected to be in place from May 2024.
13. Work continues with Waste Management NZ on ensuring the transfer station concierge function is adequately supporting our focus on diversion and complements the revised model for Earthlink operations on site.

Kerbside rubbish and recycling service*City-wide recycling contamination and behaviour change*

14. The contamination rate for February was 14%. The average contamination rate for 2022 was 18.10% compared to 15.03% in 2023. Rates continue to trend below the 15% mark which incurs less cost to Council. However, the KPI target rate of 10% is proving difficult to reach.
15. Officers have worked to ensure that as of February, the OJI processing facility began separating coloured #1 plastics (PET) during scoop testing. Coloured PET typically represents around 1% of material collected. This portion was previously counted as waste and is now included in the recyclable materials component.

16. VML have successfully concluded their summer campaign focused on altering people's recycling habits and minimising contamination. Presently, they are preparing the next phase to take our better recycling messaging through to June 2024.
17. The bin removal scheme for households with instances of repeated contamination has led to the removal of over 260 recycling bins since its implementation in November 2022. However, officers have observed a concerning trend of residents failing to place their bins at the kerbside for reinspection for several weeks after being red stickered and therefore avoiding their bin being removed. This behavior has led to our contractor having to make repeated visits to properties in an attempt to recheck bins, and if required, remove bins. To deal with this issue, we are working with Waste Management on ways in which bins can be checked by collection vehicle drivers, and if found contaminated, attached to their trucks and removed at the time of collection rather than by the follow-up inspections team.



18. Officers, in collaboration with the Council research and evaluation team, are currently conducting a survey of residents to evaluate the effectiveness of double bin latches. During strong winds, bins not securely closed are blown open, resulting in windblown litter. To address this issue, affected households were provided with double bin latches. This survey aims to assess the effectiveness of the double bin latches. If the results are positive, the solid waste team plans to expand the distribution of bin latches, with the aim of reducing windblown litter in the environment.

Climate Change Impact and Considerations

19. The matters addressed in this report have been considered in accordance with the process set out in Council's Climate Change Considerations Guide.

20. Minimising waste, diverting recyclables from landfill and recovering reusable materials (such as the potential addition of C&D diversion opportunities, diverting biosolids, etc.) contribute to a more circular economy. These activities reduce the need to extract further resources from the environment and the associated energy use in doing so.

Consultation

21. Not applicable

Legal Considerations

22. Not applicable

Financial Considerations

23. There are no current financial considerations in terms of decisions for Council, however the following items have potential financial impacts in the future:
- a. improvements to the Silverstream transfer station (e.g. Earthlink resource recovery drop off, potential addition of C&D diversion opportunities) have the potential to divert an increased amount of material from the Silverstream Landfill. A reduction in waste to landfill involves a short- term decrease in landfill revenue to Council but a long-term reduction in capital expenditure due to extending the capacity and life of the landfill.
 - b. reducing kerbside recycling contamination has a direct benefit on the cost under contract for this service as any contamination rates under 10% do not incur penalty fees for Council.

Appendices

No.	Title	Page
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2	Appendix 2: Procurement schedule	21

Author: Andred Saker
Senior Advisor - Climate and Solid Waste

Author: Geoff Roberts
Manager, Waste Minimisation

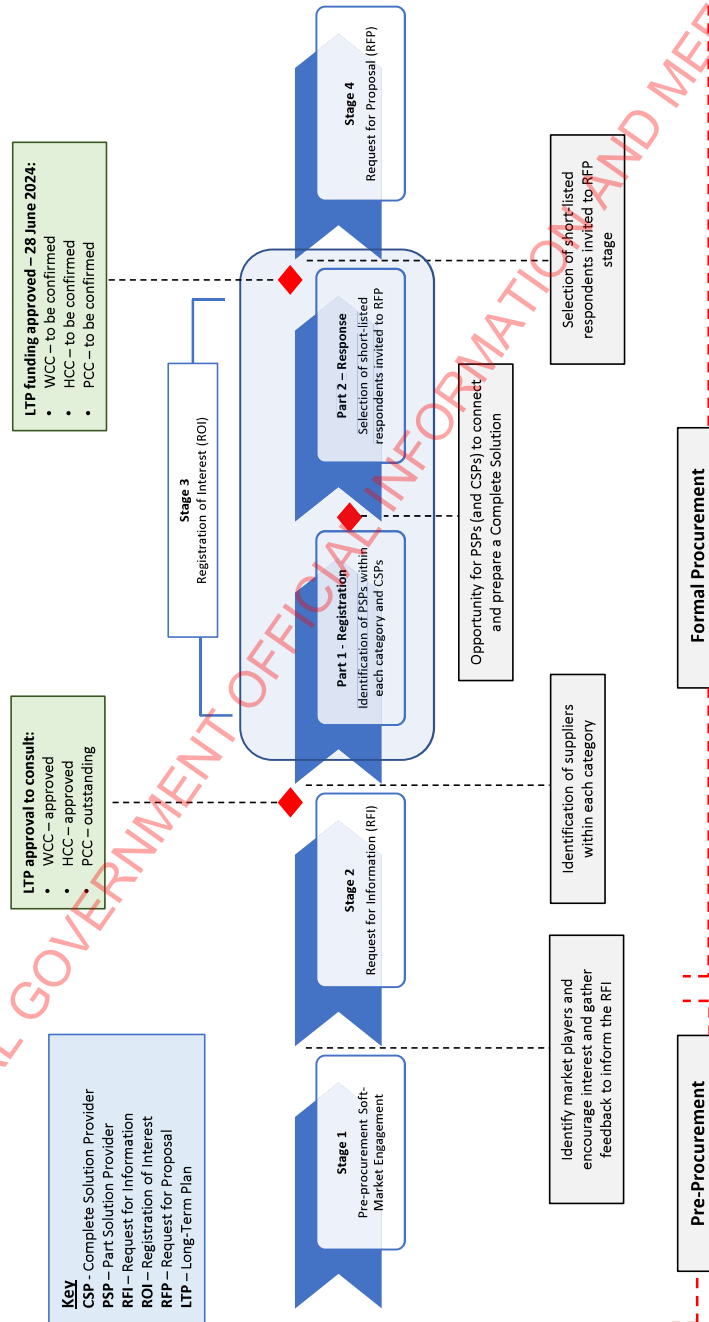
Reviewer: Jörn Scherzer
Head of Climate and Solid Waste

Approved By: Alison Geddes
Director Environment and Sustainability

Organics Processing Procurement Process

HUTT CITY **porirua**city
TE WHA KAIRANGI

Absolutely Positively
Wellington City Council
Me Heke ki Pōneke



Procurement Schedule

Action	Indicative Dates	Status
Pre-procurement completed	24/11/23	Completed
Release RFI (Stage 2)	27/11/23	Completed
Closing date for RFI (Stage 2)	5/02/24	Completed
Evaluate RFI	6/02/24 – 19/02/24	Completed
Release ROI (Stage 3)	27/02/24	Completed
Closing date for ROI (Stage 3)	22/04/24	On track
Evaluate ROI	14/05/24	On track
LTP Council Approval	28/06/24	On track
Release RFP (Stage 4)	1/07/24	Subject to LTP approval

Commercial in Confidence

1



Climate Change and Sustainability Committee

11 June 2024

Report no: CCASC2024/3/160

Update on solid waste and waste minimisation matters

Purpose of Report

1. To provide the Committee with an update on various solid waste management and minimisation matters.

Recommendation

That the Committee receives and notes the update on various solid waste management and minimisation matters.

Background

2. This report consolidates information on the status of Council's solid waste management and minimisation initiatives.
3. Detailed and regular information on the ongoing development, operation and performance of the Silverstream Landfill is covered in a separate report to the Hutt Valley Services Committee. The latest report from May 2024 is [available here](#) (page 25).

Wellington Region Waste Management and Minimisation Plan (WMMP)

4. The development timeframe for the WMMP implementation plan by officers of the Wellington region councils has been extended due to the need to complete more work on the prioritisation, scoping and costing of regional projects. This work is scheduled to be completed in draft by September 2024 and the final implementation plan is scheduled to be endorsed by the Joint Committee in December 2024.
5. Council's implementation planning for its Local Action Plan is also underway and will be completed in line with the regional implementation plan.

Diversion of construction and demolition (C&D) waste

6. Civilshare, a well-established marketplace app for managing construction and demolition (C&D) waste, has already achieved notable success in Auckland. It connects the producers of C&D waste with other parties who may have a use for these resources, which may otherwise have been discarded in landfills. They are planning to launch in the Wellington region.
7. Additionally, officers are currently conducting research and development into potential end markets for resources recovered from C&D waste streams.

Food and green organics (FOGO) processing and kerbside collections

8. The potential implementation of a new FOGO service was consulted on as part of the new draft LTP. The results from the LTP consultation demonstrated 36.6% support for a new FOGO service, 6.3% had no preference, and 55% preferred to retain the status quo with the opt-in green waste collection service.
9. To address the results of the consultation, officers will conduct further research on the benefits and drawbacks of an opt-in/opt-out approach as well as the effectiveness of home composting vs a FOGO collection service. As part of this, officers are also looking into the potential of an additional survey to better understand households' current practices and attitudes.
10. Procurement for the processing facility continues to be led by Wellington City Council on behalf of the three participating councils. The registration of interest (ROI) stage for potential suppliers closed on 20 May 2024. Evaluation of the ROI has also been completed.
11. The table below shows the timeline for the procurement process.

Action	Indicative Dates	Status
Pre-procurement completed	24/11/23	Completed
Release RFI (Stage 2)	27/11/23	Completed
Closing date for RFI (Stage 2)	5/02/24	Completed
Evaluate RFI	6/02/24 – 19/02/24	Completed
Release ROI (Stage 3)	27/02/24	Completed
Closing date for ROI (Stage 3)	20/05/24	Completed
Evaluate ROI	21/05/24	On track
LTP Council Approval	28/06/24	On track
Release RFP (Stage 4)	16/07/24	Subject to LTP approval

Trial of extraction and processing of organics from kerbside refuse

12. Waste Management New Zealand (Waste Management) has proposed to trial a Mechanical Biological Treatment process at Silverstream Landfill to extract organics from the kerbside waste stream.
13. MBT systems enable the recovery of materials contained within mixed waste, and facilitate the stabilisation of the biodegradable component of the material.

14. In brief, the proposal involves shredding and screening kerbside general waste through a plant that will separate out a significant portion of the organic material. The intention is that the organic waste be composted on site in windrows and used as landfill cover or potentially for other beneficial uses.
15. In terms of trial outcomes, it will be important to fully understand the benefits (eg volume reduction, lower carbon content) and costs of the technology, including the level of contamination of the end product (eg plastic bits below a certain diameter, etc), considering that the input material is mixed household waste that will contain a whole range of products and materials, such as soft plastics, nappies, batteries, clothing with PFAS, etc.
16. Officers are working with Waste Management on the details of the trial, with the intention to have it commence over the coming months.

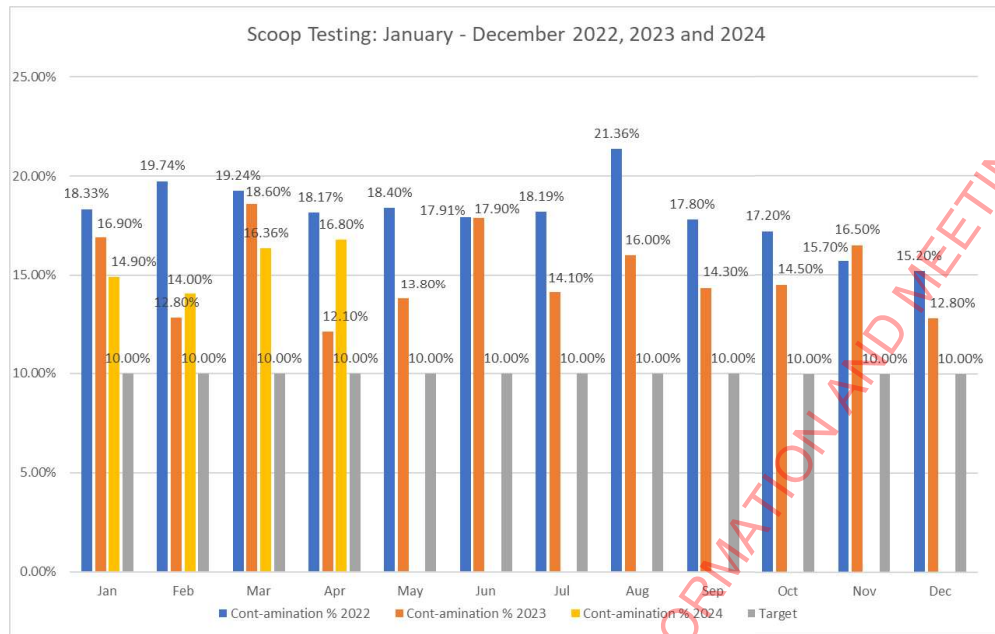
Resource recovery changes at Silverstream transfer station

17. Officers have successfully completed another “diversion scrum” day on 7 May. The team issued 24 vouchers, diverted nearly 1000 kg of material and engaged with around 70 customers at the transfer station.
18. Subsequent to the success of the diversion scrum days at the transfer station, officers have been working on developing guidelines/policies to support Earthlink in maximising diversion.
19. Work continues with Waste Management on identifying further diversion opportunities at the transfer station. A glass recycling bin will be trialed shortly and further scoping and costing on the potential to divert concrete, plasterboard and untreated timber is underway.

Kerbside rubbish and recycling service

City-wide recycling contamination and behaviour change

20. The contamination rates for March and April 2024 were recorded as 16.4% and 16.8%, respectively. While these figures indicate an increase compared to previous months, it's important to recognise the significant progress made overall. The average contamination rate has decreased from 18.7% in 2022 to about 15% in 2023.
21. Although the contamination rate has momentarily exceeded the 15% mark, the efforts to maintain and further reduce these rates are ongoing. However, achieving the KPI target rate of 10% remains a challenge.



22. To support our efforts, officers have developed a promotional video on good recycling, which showcases the OjiFS processing facility. This is available at <https://youtu.be/SqiqL4TUjg4>
23. By showing how items are processed and sent on for recycling, it aims to give residents an insight into what happens after their recycling bins are emptied, and combat the myth that recycling in Lower Hutt goes to the landfill.

Comparison of Lower Hutt contamination rates with other cities

24. In 2023, Lower Hutt, Porirua and Wellington City Councils commissioned a review of the OjiFS Seaview recycling plant's contamination methodology, to identify improvement opportunities. As part of the report, contamination levels were assessed for the different councils.
25. For the period July 2022 to June 2023 the following annual average contamination/waste levels were recorded as follows:
 - a. Hutt City Council - 16.4%
 - b. Porirua City Council - 16.9%
 - c. Wellington City Council - 16.6%
26. The report also notes that: *"the recycling contamination rates observed above for HCC, PCC and WCC are consistent with the rates observed at other recycling facilities used by other councils in New Zealand. A scan of recycling contamination rates for other councils since 2020 suggests a range of 10-25%. Some councils have observed this level of variation in their recycling contamination rates from one year to the next. There are many reasons for this variability, including the level of education and enforcement by different councils and changes in resident behaviour through restrictions on recycling collection due to Covid-19 lockdowns."*

Multi-Unit Dwelling (MUD) initiatives

27. Over the last 12 months, a project was undertaken to review waste capacity within multi-unit developments aimed at ensuring alignment with the rates charged for the services provided. With the project now completed, in many cases, the targeted rates for some MUDs were increased to match the actual bin capacity provided. These adjustments will result in a small net revenue increase for the next financial year.
28. Officers are also working on a trial with Kāinga Ora to provide and improve the bedding-in of recycling collections in new multi-unit dwelling sites. Officers will initially attend residents' meetings to provide education on the correct use of the bins to support any potential introduction of this service.

Climate Change Impact and Considerations

29. The matters addressed in this report have been considered in accordance with the process set out in Council's Climate Change Considerations Guide.
30. Minimising waste, diverting recyclables from landfill, and recovering reusable materials (such as the potential addition of C&D diversion opportunities, diverting biosolids, etc) contribute to a more circular economy. These activities reduce the need to extract further resources from the environment and the associated energy use.

Consultation

31. There is no consultation required.

Legal Considerations

32. There are no legal considerations.

Financial Considerations

33. There are no current financial considerations in terms of decisions for Council. However, the following items have potential financial impacts in the future:
- a. improvements to the Silverstream transfer station (eg Earthlink resource recovery drop off, potential addition of C&D diversion opportunities) have the potential to divert an increased amount of material from the Silverstream Landfill. A reduction in waste to landfill involves a short-term decrease in landfill revenue to Council but a long-term reduction in capital expenditure due to extending the capacity and life of the landfill.
 - b. reducing kerbside recycling contamination has a direct benefit on the cost under contract for this service as any contamination rates under 10% do not incur penalty fees for Council.

Appendices

There are no appendices for this report.

Author: Geoff Roberts
Waste and Resource Recovery Manager

Approved By: Jörn Scherzer
Acting Director, Environment and Sustainability

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Balance of waste minimisation reserve

	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2021-22 adj	2022-23
Project income	-\$292,622.09	-\$310,444.75	-\$340,613.56	-\$376,621.01	-\$395,543.64	-\$403,410.81	-\$404,253.63	-\$380,789.31	-\$373,246.36	-\$577,930.93		-\$1,042,736.17
Levy expenditure	\$209,977.44	\$197,500.00	\$135,215.00	\$193,525.00	\$219,396.54	\$238,974.56	\$337,232.35	\$336,358.38	\$506,151.19	\$417,264.65	-\$459.34	\$930,263.48
Staff expenditure	\$96,120.59	\$69,099.64	\$71,580.90	\$80,421.67	\$82,824.35	\$82,002.68	\$75,703.28	\$83,372.73	\$76,338.60	\$53,937.53		\$317,111.76
Net for each year	-\$26,524.06	-\$43,845.11	-\$133,817.66	-\$102,674.34	-\$93,327.75	-\$82,433.57	\$8,682.00	\$28,941.80	\$209,243.43	-\$106,728.75	-\$459.34	\$204,639.07
Balance	-\$26,524.06	-\$70,369.17	-\$204,186.83	-\$306,861.17	-\$400,183.93	-\$482,617.50	-\$473,935.50	-\$444,993.70	-\$235,750.27	-\$342,479.02	-\$342,938.36	-\$137,839.95
Interest Calc	-\$729.41	-\$1,332.28	-\$3,775.15	-\$4,471.67	-\$7,070.45	-\$7,724.51	-\$7,174.15	-\$6,891.97	-\$850.93	-\$2,312.92		-\$9,702.44
Accumulated	-\$729.41	-\$2,061.69	-\$5,836.84	-\$10,308.51	-\$17,378.96	-\$25,103.47	-\$32,277.62	-\$39,169.59	-\$40,020.52	-\$42,333.44	-\$42,333.44	-\$52,035.88
Total balance	-\$27,253.47	-\$72,400.86	-\$210,023.67	-\$317,169.68	-\$417,562.89	-\$507,720.97	-\$506,213.12	-\$484,163.29	-\$275,770.79	-\$384,812.45	-\$385,271.79	-\$189,875.83

Notes:

for 2013-2022, refer to previous waste levy reports

2021/22

Note: when pulling together the report for 22/23, an error was detected for the 21/22 report. An adjustment/correction has been made, which has been incorporated in the 22/23 report.

-459.34 sum of all reversing journals not in 21/22 rec

2022/23

interest rate of 4.04% as per advice by Darrin Newth 19/7/23, as an average for 22/23

Journal

GL	10.9999.8233.00000 Interest	-\$9,702.44 Interest on equity re Waste Minimisation To 30 June 2023
GL	10.9999.8113 Accumulated Fun	\$9,702.44 Interest on equity re Waste Minimisation To 30 June 2023
GL	10.9999.8232.00000 Transfers Out	-\$204,639.07 Transfer into equity Waste Minimisation To 30 June 2023
GL	10.9999.8112 Accumulated Fun	-\$204,639.07 Transfer into equity Waste Minimisation To 30 June 2023

Information only item for 22/23 costs regarding kerbside collection for recycling and optional green waste for 22/23 (waste minimisation related, but outside the 7322 cost centre)

Child Waste 30 June 2023.xlsx

Cost Centre = 1822 - Recycling collection		2022/23		2022/23		2022/23	
Account Category	Net Asset Description	YTD Actual	YTD Budget	YTD Actual	YTD Budget	YTD Actual	YTD Budget
Revenue	1103	0	0	0	0	0	0
1900RE	1970	0	0	0	0	0	0
Total Revenue		0	0	0	0	0	0
Expenditure	2160	44,415	208,364	183,645			
21FCF	Operational contracts - expenses	3,684,058	2,869,000	(76,359)			
22CON	Operational contracts - expenses	1,525,000	1,525,000	0			
27CPE	Bar debt provision movement - expenses	462,224	221,200	(22,231)			
3500H	Solid waste overhead charge - expenses	81,000	81,000	0			
3830	Interest charge adjustment - expenses	180,315	192,493	2,178			
3830	Plant depreciation - expenses	(21,460)	(21,461)	1			
3830	Depreciation Adjustment	4,458,651	3,868,066	(8,585.15)			
Total Expenditure		14,497,115	13,895,069	(627,050)			
Net Operating							
Account Category	Net Asset Description	YTD Actual	YTD Budget	YTD Actual	YTD Budget	YTD Actual	YTD Budget
Revenue	1103	0	0	0	0	0	0
1900RE	1970	12,807	0	12,807	0	12,807	0
Total Revenue		12,807	0	12,807	0	12,807	0
Expenditure	2160	0	52,316	52,316			
21FCF	Operational contracts - expenses	457,308	462,000	4,691			
22CON	Operational contracts - expenses	(11,530)	0	13,539			
27CPE	Bar debt provision movement - expenses	391,000	391,000	0			
3500H	Solid waste overhead charge - expenses	80,000	40,000	(40,000)			
3830	Interest charge adjustment - expenses	9,000	9,000	0			
3830	Plant depreciation - expenses	0	1,000	1,000			
3830	Depreciation Adjustment	14,916	14,917	(1)			
Total Expenditure		562,522	599,011	46,499			
Net Operating		550,000	599,011	59,900			

5/03/2023

10-10-1987



<https://www.scp.bvu.edu/docs/docchart.html>

Day of Year Chart

First column within each month is for regular years. The second is for leap years. 1972, 1976, 1980, 1984, 1988, 1992, 1996, 2000, 2004, 2008, 2012, 2016, 2020.

day of month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	001	032	032	060	061	091	092	121	122	152	181	211
2	002	033	033	061	062	092	093	122	123	153	182	212
3	003	034	034	062	063	093	094	123	124	154	183	213
4	004	035	035	063	064	094	095	124	125	155	184	214
5	005	036	036	064	065	095	096	125	126	156	185	215
6	006	037	037	065	066	096	097	126	127	157	186	216
7	007	038	038	066	067	097	098	127	128	158	187	217
8	008	039	039	067	068	098	099	128	129	159	188	218
9	009	040	040	068	069	099	100	129	130	160	189	219
10	010	041	041	069	070	100	101	130	131	161	190	220
11	011	042	042	070	071	101	102	131	132	162	191	221
12	012	043	043	071	072	102	103	132	133	163	192	222
13	013	044	044	072	073	103	104	133	134	164	193	223
14	014	045	045	073	074	104	105	134	135	165	194	224
15	015	046	046	074	075	105	106	135	136	166	195	225
16	016	047	047	075	076	106	107	136	137	167	196	226
17	017	048	048	076	077	107	108	137	138	168	197	227
18	018	049	049	077	078	108	109	138	139	169	198	228
19	019	050	050	078	079	109	110	139	140	170	199	229
20	020	051	051	079	080	110	111	140	141	171	200	230
21	021	052	052	080	081	111	112	141	142	172	201	231
22	022	053	053	081	082	112	113	142	143	173	202	232
23	023	054	054	082	083	113	114	143	144	174	203	233
24	024	055	055	083	084	114	115	144	145	175	204	234
25	025	056	056	084	085	115	116	145	146	176	205	235
26	026	057	057	085	086	116	117	146	147	177	206	236
27	027	058	058	086	087	117	118	147	148	178	207	237
28	028	059	059	087	088	118	119	148	149	179	208	238
29	029	060	060	088	089	119	120	149	150	180	209	239
30	030	061	061	089	090	120	121	150	151	181	210	240
31	031	062	062	090	091	121	122	151	152	182	211	241

Row Labels	Sum of Transaction Amount
Regional activities and projects	2579.78
Curtain bank service	6000
Development of WMMP 2023-29	87528.04
Enviroschools	78500
Food Organics Green Organics Business Case	55643.22
Kerbside recycling review	51709.28
Litter reduction / clean ups	22225.44
MfE levy funds	-1042736.17
Pare Kore	2400
Recycling kerbside audit	0
Seat Smart	2335.76
Silverstream Resource Recovery	96378.98
Staff costs	550
Staff costs - Comms Waste Minimisation	94436.76
Staff costs - Waste Minimisation Advisors	222125
TA Fund projects	1578
Waste min staff collaboration & prof development	20175.56
Education regarding waste minimisation and recycling	503668.76
Grand Total	205098.41

0 Note: the costs for this project were accrued in the prior year. Reversal of the accrual and payment of the invoice offset in 22/23

Please note that pages (282 - 293) have been removed from the pack, as they are withheld in full under section 7(2)(b)(ii).



Climate Change and Sustainability Committee

09 August 2024

Report no: CCASC2024/4/243

Update on solid waste and waste minimisation matters

Purpose of Report

1. To provide the Committee with an update on various solid waste management and minimisation matters.

Recommendation

That the Committee receives and notes the updates on various solid waste management and minimisation matters.

Background

2. This report consolidates information on the status of Council's solid waste management and minimisation initiatives.
3. Detailed and regular information on the ongoing development, operation and performance of the Silverstream Landfill is covered in a separate report to the Hutt Valley Services Committee. The latest report from May 2024 is [available online \(page 25\)](#).

Wellington Region Waste Management and Minimisation Plan (WMMP)

4. Development of the WMMP implementation plan by officers of the Wellington region councils continues. Multiple upcoming workshops with the Project Steering Group have been scheduled, including with the Joint Committee in September 2024.
5. Work is underway to develop the scope of all regional projects to support project prioritisation.
6. Council's implementation planning for our Local Action Plan is also underway and is scheduled to be complete in line with the regional plan by November 2024.

Diversion of construction and demolition (C&D) waste

7. Officers are looking to promote Civilshare to the Lower Hutt construction and demolition community.
8. [Civilshare](#) is an established community marketplace app that deals with C&D waste and is already operating successfully in Auckland. The app connects companies that generate C&D waste with others in the industry to enhance the reuse and/or recycling of resources that would otherwise be sent to landfill.
9. The Hutt Valley Chamber of Commerce is scheduled to host a campaign of events to promote the uptake of the app in both Lower Hutt and the Wellington Region.
10. These events, scheduled to occur by November 2024, are planned to align with the launch of Civilshare's updated app and will likely include a networking and information evening, construction site visits, 1:1 meetings with large companies and a "tradies" breakfast.
11. Separate from this, officers are currently working on a business case to identify options for diverting C&D waste from the Silverstream Landfill. The business case will investigate the current options for diverting C&D waste from the Silverstream Landfill, and then assess their relative costs, benefits and risks before recommending a preferred option.

Food organics and green organics (FOGO) kerbside collections and processing*FOGO kerbside collections*

12. When Council published its Long Term Plan for 2024-2034, it requested further information on the initiative to implement a food and green organics collection service.
13. Officers have engaged external consultants Morrison Low to conduct research on the implementation of kerbside FOGO collection models. The research is focused on evaluating opt-in/opt-out options and the relative costs and benefits compared to a compulsory targeted rate model.
14. A city-wide survey will be conducted, scheduled for September 2024 to better understand our residents' waste management practices, with a specific focus on food and garden waste. The survey will include questions related to home composting.
15. Complementary to this, bin audits are scheduled to be carried out by a specialist consultant. These audits will help us to understand the organics composition in rubbish bins for households.
16. A comprehensive report with in-depth information covering the above three initiatives will be considered by the Committee in November 2024.

Organics Processing solution procurement

17. In July 2024, Porirua City Council decided to exit the Regional Organics Project and not to take part in the next stage of the joint procurement process for a processing solution. However, the project will continue with Wellington City and Hutt City Councils.
18. The next stage in the procurement process is the Request for Proposal stage, for shortlisted suppliers only. This was scheduled to commence at the end of August 2024, as shown in the schedule below, but there may be some slight delays to reflect lessons learnt from the third stage.

Action	Indicative dates	Status
Pre-market engagement (Stage 1)	up to Nov 23	Complete
RFI (Stage 2)	Nov 23 to Feb 24	Complete
RFI evaluation	Feb 24	Complete
ROI (Stage 3)	Feb 24 to May 24	Complete
ROI evaluation	May 24 to Jul 24	Complete
RFP (Stage 4)	from Oct 24	Coming up

Project governance

19. In the context of Porirua City Council's withdrawal from the procurement process, Wellington City and Hutt City Councils have decided to review the governance structure of the project, to optimise project oversight.
20. In addition to the joint project board involving officers from WCC and HCC, an internal organics project board has been established that includes Alison Geddes, Director, Environment and Sustainability (as Chair), Jenny Livschitz (Chief Financial Officer) and Bradley Cato (Chief Legal Officer) with Jörn Scherzer (Head of Climate, Waste and Resource Recovery), as the Project Board Advisor.

Resource recovery changes at Silverstream transfer station

21. A total of 1,809 vouchers have been issued since the start of Council's discount voucher scheme in April 2023. Effectiveness was initially low. However, officers worked directly with Earthlink and WMNZ to improve the effectiveness of the scheme. This included a diversion scrum carried out in January 2024, the results of which were previously reported. This has led to a lift in voucher use.
22. In June 2024, 450 vouchers were issued, and an estimated 27t of recyclable/reuseable items were diverted from landfill.



23. The new updated contract with Earthlink commenced on 1 July 2024 with a renewed focus on engagement with transfer station users, proactive identification of divertible materials and promoting the discount voucher for diversion of recoverable resources from landfill. The number of Earthlink staff at the transfer station has also been increased from two to three. The staff will also assist in diverting other resources that Earthlink would not previously have dealt with, for example, metal products and cardboard.
24. Work continues with Waste Management NZ on ensuring the transfer station concierge function is adequately supporting our focus on diversion and complements the revised model for Earthlink operations on site.

Kerbside service

Contamination management

25. Please refer to the separate report to this Committee on contamination management and opportunities for improvement.

Bin latch trial and survey

26. In late 2023, in response to incidents of bins tipping over and spilling their content despite bin latches fitted, officers commenced providing a second free latch to households on a trial basis or where requested. The second latch can be retrofitted, as shown below.



27. A survey was also conducted to assess the effectiveness of having a second latch fitted. The majority of residents who participated found the second latches to be useful and reliable, noting a positive impact on reducing kerbside litter.
28. Council has continued distributing free additional bin latches to those who need them, with 352 extra latches distributed as of July 2024.

Climate Change Impact and Considerations

29. The matters addressed in this report have been considered in accordance with the process set out in Council's Climate Change Considerations Guide.
30. Minimising waste, diverting recyclables from landfill, and recovering reusable materials (such as the potential addition of C&D diversion opportunities, diverting biosolids, etc) contribute to a more circular economy. These activities reduce the need to extract further resources from the environment and the associated energy use.

Consultation

31. Not applicable

Legal Considerations

32. Not applicable

Financial Considerations

33. There are no current financial considerations at this time.

Appendices

There are no appendices for this report.

Author: Gaynor Muller
Advisor Waste Minimisation

Reviewed By: Jörn Scherzer
Head of Climate and Solid Waste

Approved By: Alison Geddes
Director Environment and Sustainability

RELEASED UNDER THE LOCAL GOVERNMENT OFFICIAL INFORMATION AND MEETINGS ACT 1987



Climate Change and Sustainability Committee

15 October 2024

Report no: CCASC2024/5/310

Update on solid waste and waste minimisation matters

Purpose of Report

1. To provide the Committee with an update on various solid waste management and minimisation matters.

Recommendation

That the Committee receives and notes the update on various solid waste management and minimisation matters.

Background

2. This report consolidates information on the status of Council's solid waste management and minimisation initiatives.
3. Detailed and regular information on the ongoing development, operation and performance of the Silverstream Landfill is covered in a separate report to the Hutt Valley Services Committee. [The latest report from September 2024 is available online \(page 23\).](#)

Wellington Region Waste Management and Minimisation Plan (WMMP)

4. Development of the WMMP implementation plan by officers of the Wellington region councils continues. Work is progressing towards reporting to the Joint Committee in December 2024. The Joint Committee met last in [September 2024](#).
5. Council's implementation planning for its Local Action Plan under the WMMP is also underway and is scheduled to be complete in line with the regional plan before the end of 2024.

Diversion of construction and demolition (C&D) waste

6. The options for C&D waste diversion within the Wellington region continue to evolve and develop. Wellington City Council has confirmed [a new](#)

[operator for their C&D landfill](#) with a focus on resource recovery, and Porirua City Council is also progressing work to secure an operator for its planned C&D processing facility. Officers are awaiting further detail on the implementation of these initiatives.

7. With regard to HCC's work on potential options for additional diversion, and an assessment of relative costs, benefits and risks, officers will provide an update in the new year.

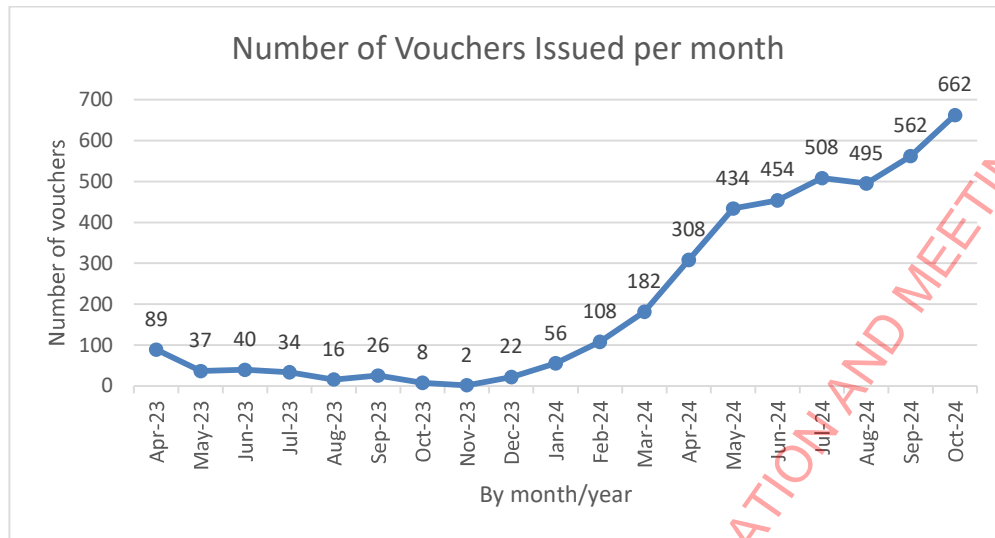
Resource recovery changes at Silverstream transfer station

8. Earthlink recently appointed a new lead for the Zero Waste Team at Silverstream transfer station, who is on site from Wednesdays through to Sundays.
9. The Zero Waste Team's focus is on directly engaging with transfer station users, and seeking out the materials and products that can be recycled, reused, or recovered.

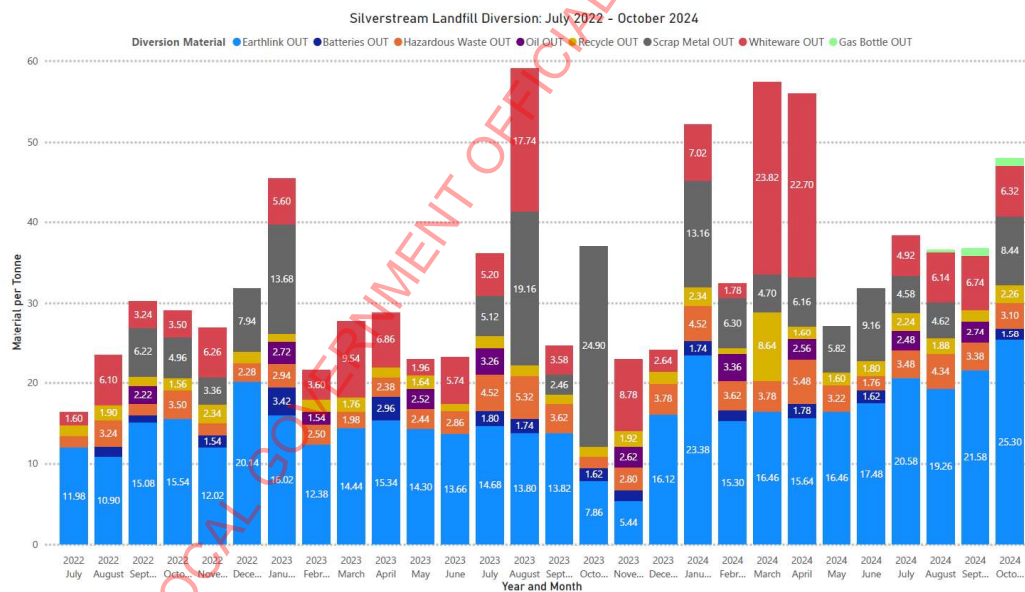


Diversion

10. Since the change to Earthlink's engagement approach at Silverstream transfer station, the number of vouchers that have been issued has gradually increased, as shown below.
11. In October 2024, 662 vouchers were issued. Since the start of the scheme in April 2023, a total of 4,043 vouchers have been issued.



12. With regard to the resulting diversion of material, the weighbridge data indicates that diversion is increasing, in particular the material targeted by Earthlink, as shown below in light blue.



Rebranding and education

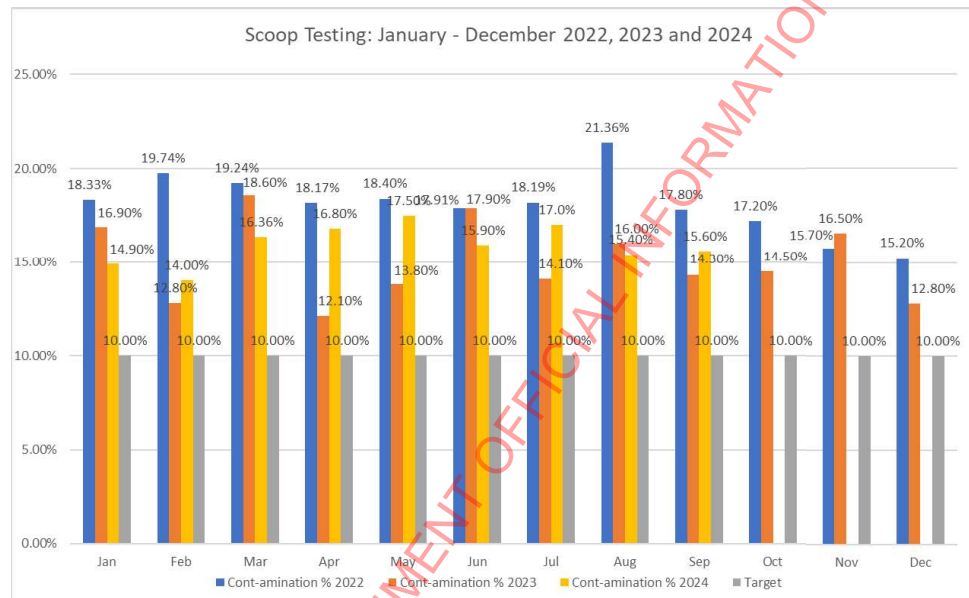
13. Officers are in the process of rebranding the drop off to 'Zero Waste Hub' to tie in with the Kapiti Coast District Council's Otaihanga Zero Waste Hub. New signage is scheduled to be in place before the end of 2024.
14. In order to assist residents and business, a flyer is being developed that will have a step-by-step guide on how to pack trailers/utes/vans before they make their way to the transfer station. This will help to ensure that all recyclable/repairable items are easy to unload at the hub and any residual waste to the pit as the last step.

15. Work is also under way to create a video to promote the discount voucher scheme with key messages on how to pack your trailer for an easy transfer station visit and cost savings.

Kerbside service

Reducing contamination

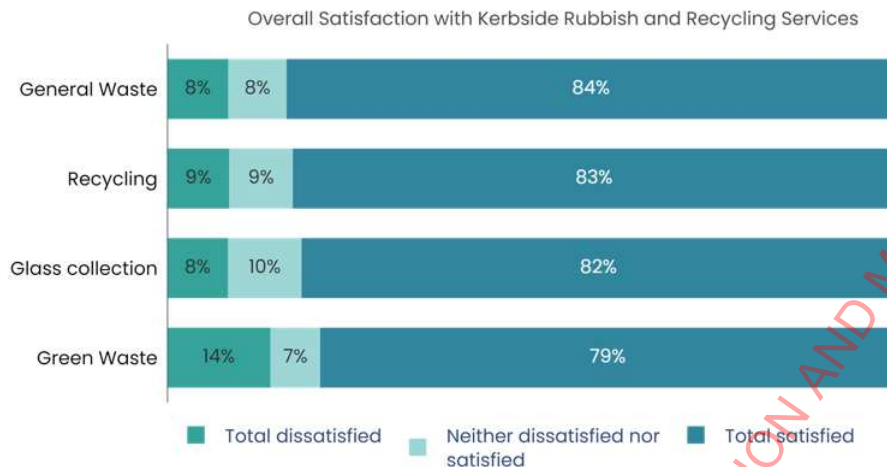
16. The contamination rates for August and September 2024 are 15.4% and 15.6% respectively. While these figures show relatively stable levels of contamination, they highlight the need for continued efforts to bring the rates down to meet the KPI of 10%.



17. Earlier this year, it was noted that bin ambassadors often faced challenges in issuing a final notice and removing bins from households that repeatedly contaminate their recycling. In response, Council collaborated with Waste Management New Zealand (WMNZ) to update the bin removal process, allowing collection vehicle drivers to inspect and remove bins using bin brackets on the trucks. This project was completed in August 2024 and is now operational.
18. Since the bin removal scheme was implemented in November 2022, 461 recycling bins that were heavily contaminated have been removed (as of September 2024).
19. Officers are progressing further investigations into the highest value contamination reduction measures as considered by the Committee in September 2024 (refer [Minute No. CCASC 24401](#)).
20. This work includes scoping out short, medium and long-term actions and how these interact in practice with the service operated by WMNZ.

Resident satisfaction

21. The results of the 2024 annual resident satisfaction survey are now available, this is a continued improvement in each stream compared to 2022 and 2023.



Recycling markets

22. In response to the OJI plant closure in Auckland, officers reached out to WMNZ to assess whether this will impact our recycling services. At this stage the closure of the mill will not have any impact on recycling collections and processing for Lower Hutt residents. OJI has confirmed that it will continue to recycle approximately 90,000 tonnes of cardboard annually at the Kinleith Mill, located near Tokoroa, while other wastepaper will be directed to an OJI Group mill in Malaysia.

Alternative technologies to manage food and green waste

23. [On 4 June 2024, Council resolved to conditionally include a FOGO service in its LTP](#), but asked officers to complete further work and report back to Council.
24. While work is still under way in order to fully respond to Council's questions and that report back is now scheduled for March 2024, officers also sought advice from Morrison Low on what alternative technologies are available to manage food and green waste.
25. Morrison Low note that all organics processing in New Zealand at scale either relies on composting (eg Hamilton) or anaerobic digestion technology (eg Auckland), and while there are small scale trials of other technologies such as pyrolysis, these are not operating at scale and are not anticipated to do so at least in the short to medium term.
26. Morrison Low also considered the potential use of Mechanical Biological Treatment (MBT). As reported in July 2024 (refer [Report no: CCASC2024/3/160, page 12](#)), MBT systems enable the recovery of materials contained within mixed waste, and facilitate the stabilisation of the biodegradable component of the material. In essence, kerbside waste is shredded and screened, and the heavier fraction (which has a significant portion of the organic material) is then composted in windrows.
27. MBT could avoid the separate collection of FOGO and results in some reduction in greenhouse gas emissions. However, the resulting 'Compost Like Output (CLO)' is not compost and is destined for the landfill, due to risks associated with physical and chemical contaminants (eg plastic pieces,

glass shards, PFAS, etc). New South Wales has a ban in place regarding the application of CLO to land. Morrison Low do not consider that it has any key role to play in New Zealand.

28. Further to this, in August 2024 officers visited an MBT facility in South Australia and found that while this technology has benefits in that context (eg it is used to produce landfill cover material), the success factors for this technology do not apply to Lower Hutt or the Wellington region. Therefore, while MBT may be useful for the remaining share of organic material in the waste stream in the future, it is unlikely to offset the need for separating FOGO at the source where possible.
29. Note that WMNZ had proposed to trial an MBT process at Silverstream Landfill to extract organics from the kerbside waste stream. However, upon further investigation, it was found that even a trial at Silverstream Landfill would not be feasible without resource consent, in light of various potential adverse effects that would need to be managed carefully (eg odour, run-off, litter production, etc). WMNZ has decided not to progress a potential trial at Silverstream, albeit may still look to carry out a trial at one of their own sites.

Climate Change Impact and Considerations

30. The matters addressed in this report have been considered in accordance with the process set out in Council's Climate Change Considerations Guide.
31. Minimising waste, diverting recyclables from landfill, and recovering reusable materials (such as the potential addition of C&D diversion opportunities, diverting biosolids, etc) contribute to a more circular economy. These activities reduce the need to extract further resources from the environment, minimising the associated energy use.

Consultation

32. Not applicable

Legal Considerations

33. Not applicable

Financial Considerations

34. There are no current financial considerations currently.

Appendices

There are no appendices for this report.

Author: Geoff Roberts
Waste and Resource Recovery Manager

Reviewed By: Jörn Scherzer
Head of Climate, Waste and Resource Recovery

Approved By: Alison Geddes
Director Environment and Sustainability



Climate Change and Sustainability Committee

03 February 2025

Report no: CCASC2025/1/26

Update on Solid Waste and Waste Minimisation matters

Purpose of Report

1. This report consolidates information on the status of Council's solid waste management and minimisation initiatives.
2. Detailed and regular information on the ongoing development, operation and performance of the Silverstream Landfill is covered in a separate report to the Hutt Valley Services Committee. The latest report from November 2024 is available online (page 32).

Recommendation

That the Committee receives and notes the update on various solid waste management and minimisation matters.

Implementation of Wellington Region Waste Management and Minimisation Plan 2023-2029 (WMMP)

Regional actions

3. WMMP implementation by officers of the Wellington Region councils continues. A [progress update](#) was provided to the Wellington Region Waste Management and Minimisation Joint Committee in December 2024, this includes updates on the major regional projects for 2024/2025 (Q2).

Lower Hutt actions

4. Implementation planning for Council's Local Action Plan under the WMMP is now complete. To provide the Committee with a regular progress update, a project dashboard has been developed, as shown in Appendix 1 attached to the report.
5. Going forward, the dashboard will provide updated information on the comprehensive work programme at Hutt City Council to implement the WMMP. The dashboard also includes those regional or sub-regional projects that Hutt City Council has elected to lead.

6. A total of 28 projects are set out in the dashboard, the majority of these are in the planning or delivery phase, and the diagram in Appendix 2 attached to the report shows the linkages between those projects and the WMMP targets, alongside the regional projects that Council will also contribute to.
7. The bulk of the projects listed in the dashboard are waste levy funded rather than from rates.
8. Please note that more detailed information can still be made available on projects in the body of this paper where appropriate.

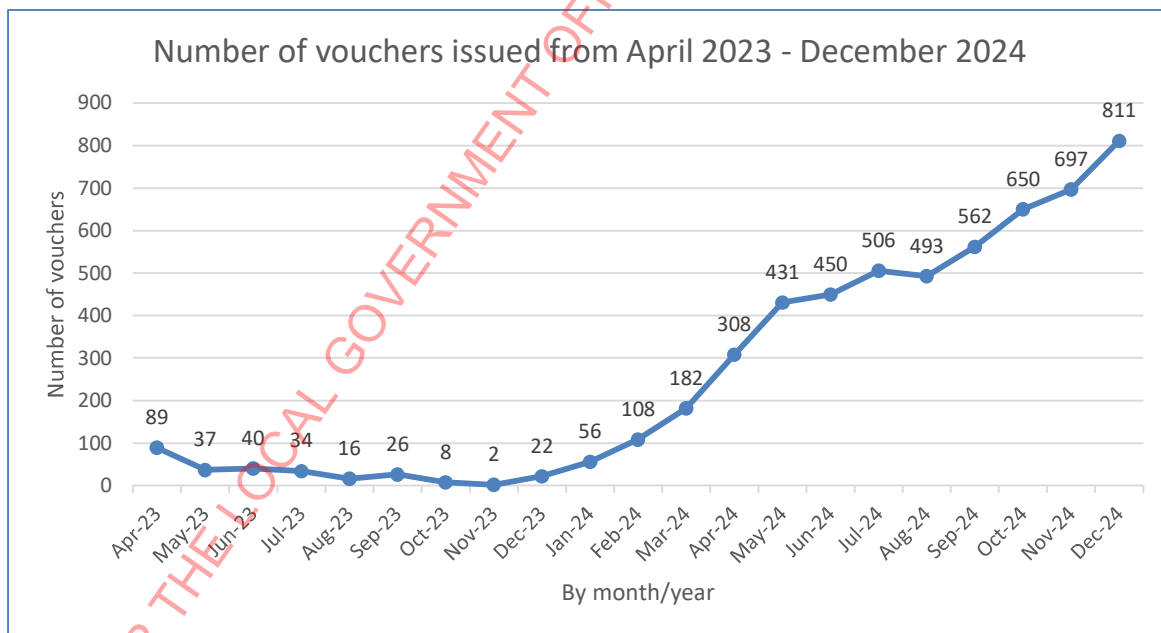
Food organics and green organics (FOGO) kerbside collections and processing

9. An update and further advice on this project was provided via a paper to the Long Term Plan/ Annual Plan Subcommittee on 24 February 2025. [Report: LTPAP2025/1/36 \(page 366\)](#)

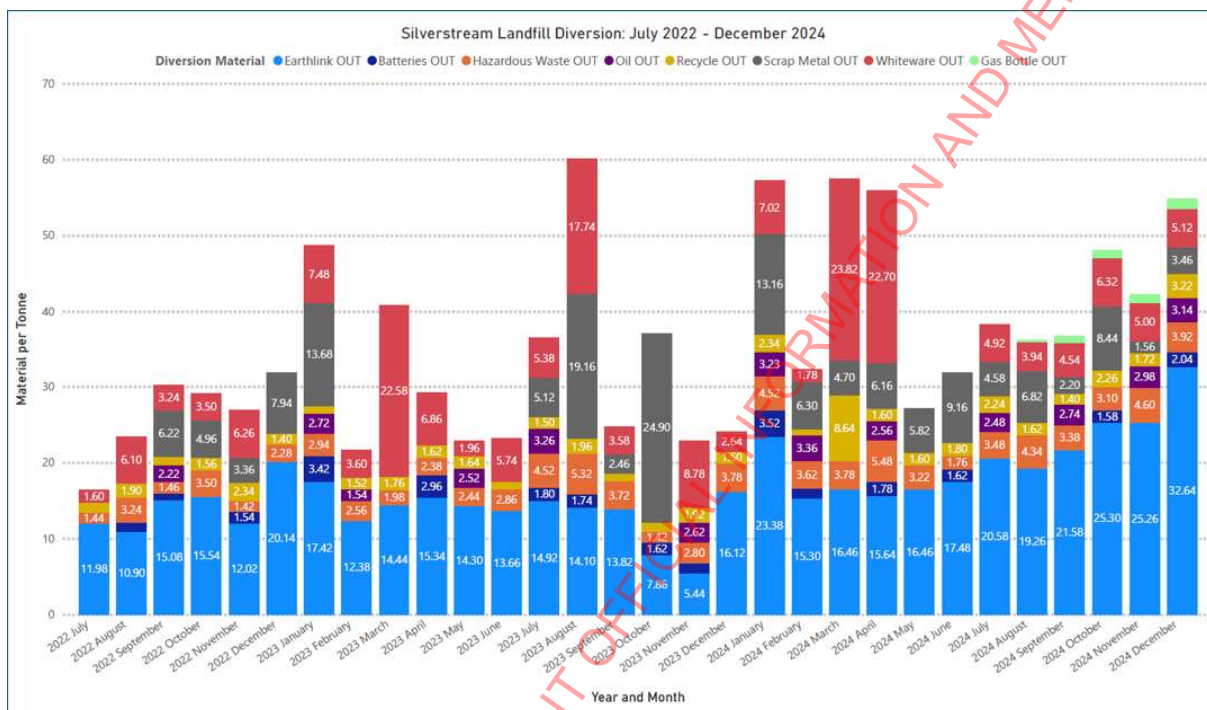
Resource recovery changes at Silverstream Landfill transfer station

Diversion

10. In December 2024, 811 vouchers were issued. Since the start of the scheme in April 2023, a total of 5,528 vouchers have been issued. Over the past 12 months, the number of vouchers issued has shown a consistent upward trend (see figure below).

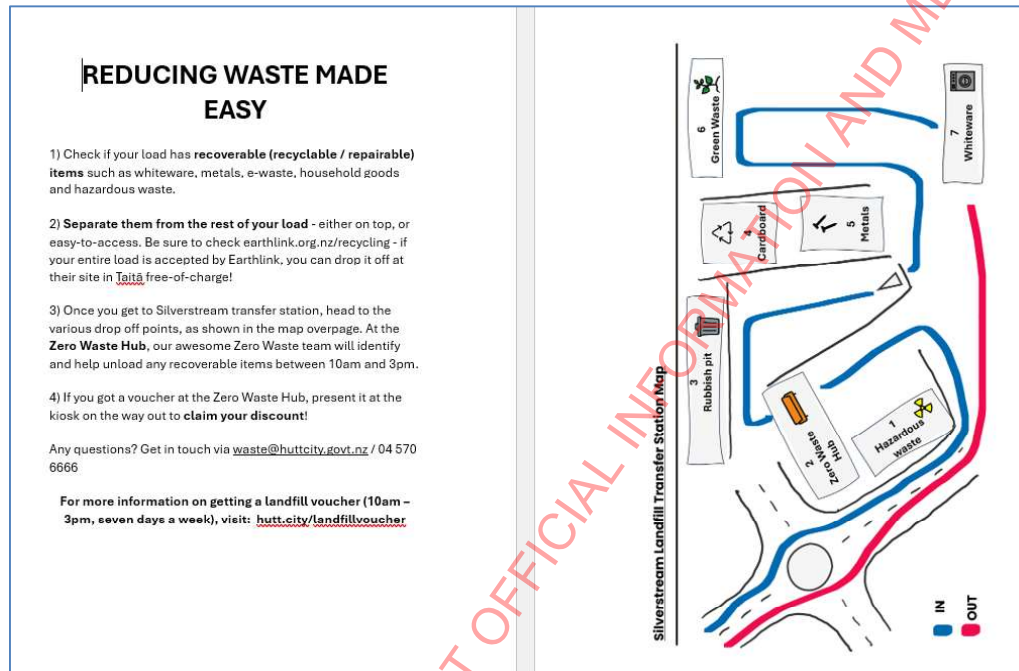


11. Regarding the resulting diversion of material, the weighbridge data indicates that diversion is increasing, in particular the material targeted by Earthlink, as shown below in light blue.
12. For the month of December 2024, approximately 33 tonnes of materials were diverted because of the improved direct engagement and the voucher discount scheme.



Rebranding and education

13. To assist residents and businesses, a flyer was developed that has a step-by-step guide on how to pack trailers/utes/vans before they visit the transfer station. This is to help ensure that all recyclable/repairable/reuseable items are easy to unload at the hub and any residual waste only goes to the pit as the last step.



14. Work is underway for several other actions as part of improvements of the hub such as new signage, further improvements to traffic flow, improving the flyer and a video to promote the discount voucher.

Kerbside Service

Contamination

15. An update on Council's work to reduce recycling contamination is set out in a standalone report (CCASC2025/1/27).

Glass Collection

16. A promotional and education video for glass recycling collection promotional has been released on YouTube, Facebook, Instagram, and LinkedIn. You can view it here: <https://www.youtube.com/watch?v=PbAatVMILhc>.
17. The video aims to educate residents on proper glass recycling practices, including:
- a. ensuring glass bottles and jars are rinsed and clean, with lids removed.
 - b. avoiding loose lids, broken glass, or other non-glass items in the glass crate.
 - c. keeping the crate filled only up to the rim.

2025 Recycling and waste calendar

18. In the last three years, a recycling and waste collection calendar was mailed to every Lower Hutt household. However, the demand for physical calendars has been declining for some time, given the range of alternatives.
19. For 2025 households were provided with a range of options to access the calendar, albeit a physical copy of the calendar was only made available upon request.
20. The range of options were as follows:
 - a. Download a printable version or check their collection day at www.toogoodtowaste.nz.
 - b. Pick up a copy at their local Neighbourhood Hub or the Laings Road office.
 - c. Request a copy by completing this form: <https://form.jotform.com/222776802131048>.
21. Only approximately 1,000 households requested a physical copy of the calendar, and through this revised approach, more than \$60,000 in costs could be avoided

First Fully Electric Side Loader

22. The first fully electric side loader for Council's recycling collection has been in operation since December 2024. A second fully electric side loader is scheduled to commence operation in Q2 of 2025. Further electric side loader trucks are expected to commence operation following this, but the timing of this is yet to be confirmed.

Climate Change Impact and Considerations

23. The matters addressed in this report have been considered in accordance with the process set out in Council's Climate Change Considerations Guide.
24. Minimising waste, diverting recyclables from landfill, and recovering reusable materials (such as the potential addition of C&D diversion opportunities, diverting biosolids, etc) contribute to a more circular economy. These activities reduce the need to extract further resources from the environment and the associated energy use.

Consultation

25. Not applicable.

Legal Considerations

26. There are no legal considerations.

Financial Considerations

27. There are no current financial considerations at this time.

Appendices

No.	Title	Page
1	Appendix 1: Local Action Project Dashboard	12
2	Appendix 2: WMMP Target Linkages of Local and Regional Projects	13

Author: Jessica Hayman
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Appendix 2. Summary of WMMP Local Action Plan Programme Dashboard

There are currently 28 projects, the majority of which are planned or already underway to meet the actions outlined in the WMMP (2023-2029), outlined in the programme summary below.

Name	LAP Action*	Regional/Local?	Stage	Project Description	Start	End	Project type	Subject matter	Project impact**	Project update
City wide behaviour change	Action 7	Local Project	In progress	Delivering a wide reaching campaign(s) to support waste minimisation.	1/10/2024	31/12/2028	Comms/engagement	Behaviour change	High Weight	HCC is working to secure an agency partner to deliver on various waste minimisation and resource recovery information requirements, and to encourage behaviour change. Procurement is in its final stage, and the preferred plan is to be confirmed before the end of Q3. A detailed project update has been provided to the LTP subcommittee on 24 February 2025.
FOGO kerbside collection and processing	Action 12	Sub-Regional Project	In progress	Plan and implement a potential new kerbside FOGO service, and identify a suitable processing solution.	1/04/2023	31/12/2028	Operational	Organics	High Weight	
Additional zero waste hub	Action 12	Local Project	In progress	Investigate options for a potential additional Zero Waste Hub facility, including working with existing resource recovery partners to expand operations.	1/01/2025	31/12/2028	Operational	C&D	High Weight	Work is underway to scope options and/or opportunities for an additional zero waste hub in Lower Hutt, with a specific focus on C&D waste and maximising resource recovery.
C&D commercial solution	Action 13	Sub-Regional Project	In progress	Investigate and implement diversion pathways for commercial C&D waste.	1/01/2025	31/12/2028	Operational	C&D	High Weight	As part of the Porirua City Council (PCC) project to develop a C&D processing facility, HCC has been allocated central government funding toward a site-specific consultation pilot. Work is under way to scope options and opportunities at Silverstream transfer station. A detailed project update has been provided via a separate paper to the Climate Change and Sustainability Committee on 25 February 2025.
Kerbside - Contamination reduction	Action 19	Local Project	In progress	Investigate and implement a range of actions to address and reduce kerbside contamination.	1/07/2024	30/06/2026	Comms/engagement	Kerbside	High Weight	A detailed project update has been provided via a separate paper to the Climate Change and Sustainability Committee on 25 February 2025.
EV Charging Hub and landfill electrification	Action 20	Local Project	In progress	Install EV Charging Hub for heavy vehicles and machinery at the Silverstream Landfill.	1/10/2024	31/03/2025	Operational	Silverstream	High Weight	Construction work is under way. Completion is scheduled for Q4.
Soil and aggregate recycling	Action 12	Local Project	In progress	Collaborate with partners to potentially develop a soil and aggregate recycling solution at Silverstream Landfill.	1/10/2024	31/03/2027	Operational	C&D	High Weight	Project scoping and planning is underway.
Bylaw Implementation (C&D waste)	Action 9	Local Project	Not started	Implementation of the bylaw requirement to have waste management plans for new developments over \$2M in value.	1/04/2025	1/04/2026	Operational	Compliance	High Weight	Not yet started.
Future of residual waste	Action 11	Regional Project	Planning	Undertake an investigation to assess the regional flow of waste and the current and future infrastructure and services required to manage known and future residual waste streams (including disposal or alternatives). HCC leads this regional project.	1/10/2025	1/10/2027	Policy	Research	High Weight	Work is underway to refine the scope and plan for this project.
Minimising Event Waste	Action 2	Local Project	In progress	Establish and embed a process with internal and external stakeholders to minimise waste and litter at community events with a focus on the annual HCC Green Star award.	1/04/2024	31/12/2025	Operational	Events	Medium Weight	A trial is under way with Non-Stop Solutions to partner with event organisers to ensure best practice waste management and minimisation for community events.
Silverstream resource recovery improvements	Action 4	Local Project	In progress	Identify and implement transfer station and Zero Waste Hub improvements to increase diversion of recoverable materials.	1/07/2024	30/06/2025	Operational	Resource recovery	Medium Weight	Earthlink's new operating model at Silverstream (approved April 2024) has increased active customer engagement to boost resource diversion. Since mid-2024, the number of engagements has significantly risen, leading to higher material recovery and better outreach. Over 800 discount vouchers were issued in December 2024.
Waste Forum	Action 6	Regional Project	In progress	Provide Secretary and Treasurer support for the Forum and maximise effectiveness.	1/01/2023	31/12/2029	Comms/engagement	Events	Medium Weight	Planning underway for hosting the Waste Forum in Lower Hutt in May 2025. Work is also under way to identify opportunities for further improving the effectiveness and reach of the Forum.
Soil remediation trial	Action 12	Sub-Regional Project	In progress	A partner has proposed a trial of a technology to neutralise recalcitrant pollutants (e.g. contaminated with asbestos).	1/10/2024	30/06/2027	Operational	C&D	Medium Weight	Trial preparation continues.
Business engagement	Action 4	Regionally Coordinated Project	Not started	Develop a business engagement plan consistent with agreed regional approach.	1/04/2025	31/03/2026	Comms/engagement	Business	Medium Weight	Not yet started.
Treated timber diversion	Action 11	Local Project	On hold	Research diversion opportunities for treated (and untreated) timber.	1/07/2024	1/04/2026	Operational	Research	Medium Weight	Not yet started.
Business waste audits	Action 4	Local Project	Planning	Offer and deliver audits to engaged businesses as part of business engagement plan.	1/04/2026	31/03/2027	Comms/engagement	Business	Medium Weight	Not yet started.
Bylaw review	Action 9	Regionally Coordinated Project	Planning	Undertake a review of Council's Solid Waste Management and Minimisation Bylaw 2023-2029 in line with statutory requirements.	1/02/2025	01/10/2026	Policy	Business	Medium Weight	Not yet started.
Decarbonise landfill contracts	Action 3	Local Project	In progress	Ensuring newly awarded waste contracts reduce emissions within contract activity and to report on contract emissions annually in alignment with HCC decarbonisation targets.	1/07/2023	31/12/2028	Internal	Waste minimisation	Medium Weight	All significant waste-related procurements have included specific emission reduction requirements and/or criteria. This includes the landfill capex works contract, the landfill design and monitoring contract, and the regional FOGO processing solution procurement. Planning for the closed landfill maintenance contract is currently under way.
Organisational behaviour change	Action 2	Local Project	In progress	Implement waste minimisation initiatives internally (at Laring's road administrative building) and across council facilities.	1/10/2024	1/04/2027	Internal	Behaviour change	Low Weight	A waste audit is scheduled for the Laring's Road administration building in Q3. The results will be used to inform the Laring's Road administration building waste management plan for their Green Star rating.
C&D single-use transition engagement	Action 4	Local Project	In progress	Work to transition Lower Hutt C&D to a single-use free city, with a primary focus on eliminating disposable coffee cups and supporting reuse.	1/08/2025	31/12/2025	Comms/engagement	Waste minimisation	Low Weight	Early engagement with businesses is underway to inform the development of a potential campaign and/or implementation options.
Local government advocacy	Action 10	Local Project	In progress	Central government advocacy opportunities are approached from a regional perspective or local perspective, if and when appropriate.	1/01/2023	31/12/2028	Comms/engagement		Low Weight	HCC has taken several opportunities for advocacy including submitting on the second Emissions Reduction Plan consultation, disposal of bioislets to land guidelines, and the plastic packaging product stewardship scheme co-design report. In Q2 and Q3, HCC supported efforts for a trial of a bioislet trial at Silverstream Landfill. Its outcome will inform whether bioislets can be reused in the remediation of borrow areas.
Bioislets trial at Silverstream	Action 15	Local Project	In progress	Trial the reuse of bioislets in borrow areas of Silverstream Landfill.	1/07/2024	30/06/2025	Operational	Silverstream	Low Weight	A dating trials underway at Silverstream Landfill. Its outcome will inform whether bioislets can be reused in the remediation of borrow areas.
Site remediation	Action 21	Local Project	In progress	Identify and implement remediation options for closed landfills.	1/10/2024	21/02/2027	Operational	Research	Low Weight	Options for remediation are under investigation.
Stormwater treatment trial	Action 18	Local Project	In progress	Trial a Downstream Defender unit to capture gross pollutants, litter, and fine contaminants in stormwater to provide baseline data for waste and pollutants entering waterways.	1/10/2024	31/12/2025	Operational	Litter	Low Weight	Work is under way with Wellington Water and GWRC to scope the potential trial of Downstream Defender device.
Battery Recycling	Action 2	Local Project	In progress	Investigate options, and if viable implement, accessible battery collection for recycling for Lower Hutt residents.	1/01/2025	30/06/2025	Operational	Resource Recovery	Low Weight	Collection options and costs have been identified, and a preferred option has been selected. The timing and scale of a trial is being scoped.
Sustainable Procurement	Action 3	Local Project	Not started	Create and implement a policy for reducing waste in contracts and services procured across HCC.	30/09/2025	31/03/2026	Internal	Waste minimisation	Low Weight	Not yet started.
Stakeholder CRM initiative	Action 5	Local Project	Not started	Establish a database of external stakeholders to enable scope for wider engagement.	30/02/2025	31/03/2025	Internal	Data	Low Weight	Not yet started.
Litter reduction campaign	Action 18	Local Project	Not started	Implement city-wide campaign on litter and illegal dumping.	1/04/2026	30/06/2027	Comms/engagement	Litter	Low Weight	Not yet started.

* Projects related to Actions 1 and 17 are delivered through contracts delivered by external providers and are treated as business as usual (Enviroschools contract, Sustainable Coastlines contract).

**Project weight is calculated from a weighted formula that includes 'priority', 'diversion potential', 'reach', and 'budget'.

Local HCC projects

■ Battery recycling
 ■ Central government advocacy
 ■ Organisational behaviour change
 ■ Site remediation
 ■ Stakeholder CRM initiative
 ■ Stormwater treatment trial
 ■ Beneficial reuse of biosolids
 ■ CBD single-use transition engagement
 ■ Business waste audits
 ■ Soil remediation trial
 ■ Treated timber diversion research
 ■ City wide behaviour change
 ■ Decarbonising contracts and sustainable procurement
 ■ Litter reduction campaign
 ■ Silverstream resource recovery improvements
 ■ C&D commercial solution
 ■ EV charging hub and landfill electrification
 ■ Bylaw implementation
 ■ Minimising event waste
 ■ FOGO kerbside collection and processing
 ■ Kerbside contamination reduction
 ■ Soil and aggregate recycling
 ■ Additional zero waste hub

WMMP targets

1 - Reduction of waste to landfill
 1a - C&D waste processing and recovery in Wellington
 1b - Organic processing in Wellington
 1c - New resource recovery locations added
 2 - Biogenic methane reduction
 3 - Emissions reduction from collection and transport
 4 - Access to kerbside recycling
 5 - Food scraps collection access

Regional projects requiring HCC contribution

■ Regional data framework development
 ■ Regional framework development
 ■ Regionally consistent litter monitoring
 ■ Waste management in emergencies
 ■ Future of cleanfill investigation
 ■ Prevention of environmental harm from litter
 ■ Regional website development
 ■ Strengthening the Wellington Waste Forum
 ■ 2029 Waste Assessment development
 ■ 2029-2036 WMMP development
 ■ Contaminated soil investigation
 ■ Regional business engagement support
 ■ Regional recycling processing investigation
 ■ Future of Residual Waste
 ■ Regional bylaw review and update
 ■ Business engagement
 ■ Regional bylaw implementation
 ■ Regional resource network expansion
 ■ Construction and demolition waste recovery
 ■ Organics processing solution

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Proposal for Asbestos Destruction Pilot Trial

Prepared by: Environmental Decontamination (NZ) Limited
For consideration: Hutt City Council
Date: 27th June 2025

Environmental Decontamination (NZ) Limited

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1. Executive Summary

Environmental Decontamination (NZ) Limited (EDL®) is a New Zealand-based company that has developed proprietary its mechanochemical destruction (MCD®) technology designed to treat recalcitrant contaminants that pose significant risks to human health and the environment. This innovative technology is both registered and patented across multiple global jurisdictions, including Asia, Africa, the Americas, Europe, and Australasia.

With established expertise, infrastructure, and operational capacity, EDL is well positioned to design, construct, and implement viable MCD systems to support the proposed asbestos destruction pilot trial. The research programme will be conducted at the Silverstream Landfill, where EDL can draw on a team of onsite MCD specialists, including scientists, engineers, and project managers, as well as a range of fit-for-purpose plant and equipment. EDL's unique expertise and technological solutions ensures the delivery of outcomes that align with council objectives, environmental standards, and broader urban sustainability goals.

Through deployment of EDL's pilot-scale MCD system, the project aims to demonstrate a scalable and effective solution for the destruction of asbestos and asbestos-containing materials (ACM). It is anticipated that the trial will validate the technology's ability to operate at throughput rates appropriate for landfills such as Silverstream, laying the foundation for future commercial-scale applications.

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2. Overview of the Asbestos Problem

Environmental Decontamination (NZ) Limited (EDL) is an innovation-driven company that continues to pioneer the large-scale treatment of asbestos and asbestos-containing materials (ACMs) using our patented mechanochemical destruction (MCD) systems. Refer to Section 3 Technology Description for a detailed breakdown of the underlying treatment process. At EDL, we are focused on achieving the best possible results for human health and the environment, while utilising cutting-edge scientific concepts to address the complexities and challenges associated with ACM degradation.

For decades, asbestos was widely used across industrial, commercial, and consumer sectors due to its exceptional physical and chemical properties, including heat resistance, high tensile strength, flexibility, and chemical inertness. In the construction industry, ACMs were especially valued for their superior thermal and electrical insulation properties.

However, despite its utility, the health risks associated with asbestos exposure became increasingly evident by the 1970s. Research into occupational exposure revealed that inhaling asbestos fibres could cause severe respiratory diseases, including mesothelioma, asbestosis, and lung cancer. This prompted regulatory action, with restrictions beginning in the 1980s and most developed nations banning asbestos use by the 1990s, except in specific, unavoidable circumstances such as power stations.

Despite strict regulation associated with the use, removal, and disposal of ACMs, approximately 100,000 people are estimated to die annually from diseases related to asbestos exposure globally. This is due to the presence of asbestos in the existing building stock globally. In other words, any building built before the 1990s is likely to contain asbestos in one form or another (e.g., cladding, insulation, roof tiles, pipes). Buildings consisting of ACMs pose significant risk due to aging infrastructure from ongoing weathering, in addition to the clear risks associated with demolishing or decommissioning, as well as ongoing risk associated with subsequent disposal / treatment.



Figure 1. Closeup of raw chrysotile asbestos.

One of the long-term ramifications of ACM disposal at landfill or storage facilities is the creation of legacy issues that need to be dealt with in the future, rather than suitably treating the immediate problematic asbestos waste with practical, efficient, and sustainable technologies. Diversion of ACM away from landfill presents a unique opportunity to treat and even repurpose asbestos waste streams. EDL has demonstrated the effectiveness and adaptability of the MCD technology to treat a range of contaminants on a large-scale over the last 20 years. Major projects include the treatment of ACM, obsolete pesticides, banned chemical stockpiles, and highly contaminated soil.

EDL are seeking to develop a technical and commercial case for our Mechanochemical Destruction (MCD) technology to treat asbestos and ACM materials typically disposed of at landfills. EDL's inhouse expertise and knowledge will be directly leveraged for this asbestos destruction pilot trial, forming part of the overall capability to establish a new technological approach for treating asbestos and ACMs derived from demolition waste, currently disposed of at landfill facilities.

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3. Technology Description

EDL is a New Zealand based company that has developed the MCD technology for the treatment of recalcitrant contaminants which pose a threat to human health and the environment. This technology has been registered and patented in Asia, Africa, America, Europe, and Australasia.

EDL has substantial infield experience, which includes large scale clean-up of soils contaminated with persistent organic pollutants (POPs). Over the past 20+ years, the MCD process has demonstrated its effectiveness and adaptability by destroying a range of contaminants on a large-scale, including ACM, obsolete pesticides, and contaminated soil. Initial pilot and full-scale projects focused on using MCD to degrade organic contaminants in soil, with more recent trials investigating asbestos and emerging organic contaminants.

3.1 Fundamentals of the MCD Treatment Process

MCD, or high energy ball milling (HEBM), has recently gained traction in the waste management sector due to its ability to effectively destroy asbestos fibres with no requisite for toxic solvents, extreme temperatures, harmful additives, or high pressures, which collectively make processing more expensive and complex. To provide a holistic understanding, the fundamental theoretical principles of MCD are discussed below, thereby explicating the rationale behind utilising HEBM as an ACM treatment technology.

Mechanochemistry is an established scientific field which explores the physical and chemical transformation of substances that have been mechanically stressed. The mechanisms involved in mechanochemical transformations tend to be complex and dissimilar to reactions observed in other remediation processes (e.g., thermal, photochemical, chemical oxidation).

MCD provides the immense, indiscriminate mechanical force required to drive chemical reactions, resulting in deformations and an array of intramolecular and intermolecular alterations. The ball-to-ball and ball-to-surface collision points are the major regions of chemical reaction initiation. The reactions induced at the collision point include material fracture, radical formation, electron transfer, and electron sharing which can result in the formation and, in the case of the proposed study, the amorphisation of strong crystalline structures.

While heat is generated under ball milling conditions, it was ruled out in early mechanochemistry research as the primary reaction initiation mechanism due to the abundance of empirical evidence showing the progression of mechanochemical reactions at incredibly low temperatures (e.g., 77 K). Rather, the formation of surface radicals and matrix defects by strong mechanical activation (e.g., grinding, ball milling) are the main reaction initiators and propagators.

For asbestos and ACM subjected to MCD conditions, mechanical activation leads to material fracture and the creation of highly reactive surfaces, with the end-product being an inert powder that is amenable to reuse for construction applications. Several international research groups have published MCD research related to the degradation of asbestos and ACM by HEBM. A summary of literature research findings is attached as Appendix A.

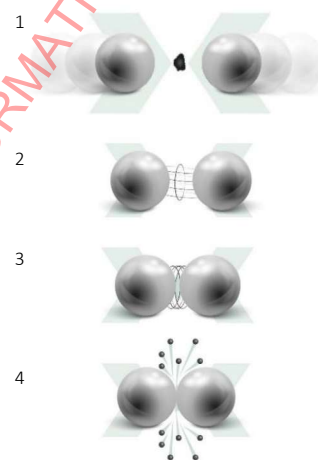


Figure 2. MCD Collision Profile: 1) High Velocity Impact; 2) Elastic Deformations; 3) Plastic Deformations; 4) Fracture.

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3.2 Preliminary Pilot-Scale MCD Trials (2015 & 2016)

Using the MCD technology, initial pilot-scale ACM amorphisation trials were conducted in 2015 and 2016. The work was carried out by EDL at an existing landfill site operated by EnviroServ Waste Management (EnviroServ) in Johannesburg, South Africa. This site was selected for logistical purposes, as it was already an excellent source for a variety of ACMs.

These initial pilot scale trials can be divided into three discrete investigations, based on their overall objectives and reactor development:

- 2015 Pre-Trial - preliminary investigation carried out by EDL and EnviroServ.
- 2015 Trial - EDL explored the scalability potential of the MCD technology to treat ACM; in other words, can we replicate degradation results observed in the laboratory trials as described in the literature.
- 2016 Trial - EDL used the results and outcomes from the 2015 trial to further develop the testing methodology and enhance the reactor system.

Tauw Group BV Netherlands (Tauw) collaborated with EDL as an external consultant during the 2015 and 2016 trials, to determine whether the MCD process is an appropriate technology for the treatment of asbestos and ACM. As an experienced consultancy firm and specialists in waste management, Tauw were able to provide an onsite specialist technician to independently verify and validate the MCD process and carry out an appropriate sampling procedure.

The conclusive outcomes of the 2015 and 2016 pilot trials reveal rapid neutralisation and destruction of fibrous asbestos in cement-bound materials can be achieved using EDL's MCD technology. A complete breakdown of these initial pilot trials is provided in Appendix B.

3.3 Technology Maturity

The proposed technological solution for the effective treatment of ACM has achieved the requisite maturity, or technology readiness level, for demonstration. Evidence to support this postulation is two-fold: (1) based on positive results from previous fundamental and applied research at benchtop scale; and (2) previous demonstrated capability of EDL's MCD technology to destroy ACM and other types of recalcitrant organic pollutants at pilot- and full-scale.



Figure 3. Past MCD works. A) MCD setup in San Francisco, USA (2008). B) Full-scale operation Mapua, New Zealand (2004). C) MCD setup at a former military airbase in Bien Hao, Vietnam (2012).

In addition to the progression of laboratory research activities, the MCD technology has been effectively deployed at pilot, demonstration, and full-scale for a range of hazardous waste streams over the last 20 years, typically targeting soil contaminated with POPs (e.g., polychlorinated biphenyls, obsolete pesticides, polychlorinated dibenzodioxins). Permanent and mobile MCD systems are shown above.

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Ongoing R&D over this time has led to the development of several generations of vibratory and stirred ball mills, with the latest 5th generation of the MCD system proposed for use in the ACM treatment pilot project.

The maturity of the MCD technology as essentially field-ready systems is well-established, in addition to the verification of concepts which underpin ball milling asbestos as a destructive treatment technique. Therefore, EDL has existing capability and capacity to readily design, prepare, and institute viable MCD systems for the proposed pilot trial. The proposed research programme will take place at the Silverstream Landfill, where the project will benefit from onsite MCD specialists (e.g., scientists, engineers, project managers) and access to a variety of necessary equipment. Following the successful outcomes of the proposed works, it is envisaged that the MCD technology will be one of a handful of validated field-ready techniques capable of effectively treating asbestos and ACM.

3.4 Third-Party Technology Validation

EDL is actively undertaking, and has previously delivered, a wide range of development projects across bench-scale, pilot-scale, and full-scale levels to address complex waste streams. These projects demonstrate the progressive validation of our technologies under varying conditions and scales, typically validated or assessed by third parties (e.g., governmental agencies, independent experts, large international consultancies). A breakdown of select technology assessments and validated projects is provided below.

3.4.1 Select Past Projects

Bureau KLB - Asbestos Treatment Technologies

A thorough evaluation, including a technology readiness assessment of the MCD technology, was undertaken as part of a Dutch Government-commissioned technology review entitled “*On the lookout for practical sustainable options for asbestos waste treatment*”, performed by Bureau KLB in 2018. The focus of the review was the recycling or treatment of non-radioactive ACM derived from demolition activities.

The KLB review included four comprehensive assessment parameters: technology readiness level, distance to market, sustainability aspects, area of application.

The KLB review concluded that the MCD technology has a TRL of 8-9 for asbestos and ACM. KLB also stated that the distance to market of the MCD technology was relatively small: “*the technique is proven on a pilot/semi-industrial scale and has also proved to be effective for other (organic) contaminants. While the pretreatment demands are strict (dimensions of crushed ACM and moisture content) ...the installation has a short construction time.*” It is envisaged that the operation of the MCD technology for asbestos and ACM would lead to a positive business case.

Significant sustainability aspects were also defined in the KLB report, which inherently results in positive impacts for the treatment of asbestos and ACM: (1) simplicity and robustness of the process; (2) complete fibre destruction; (3) reusability of the end-product; (4) relatively low energy consumption for the treatment process; (5) relatively simple environmental control techniques; and (6) modularity/mobility of the installation.

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United Nations Development Programme - Dioxin Treatment Trial in Vietnam

In 2012, EDL successfully completed a United Nations Development Programme (UNDP)-funded technology demonstration at the Bien Hoa airbase in Vietnam, one of the country's most heavily dioxin-contaminated sites linked to historical Agent Orange use. The trial involved the mechanochemical treatment of approximately 100 tonnes of highly contaminated soil, with an average concentration of polychlorinated dibenzo-p-dioxins (PCDDs) measured at 30,000 ppt TEQ, and a range spanning from 5,000 to 120,000 ppt TEQ. The independent evaluation report, attached, confirmed the effectiveness of EDL's proprietary MCD® technology in achieving significant contaminant reduction and recommended the approach for broader deployment in remediating dioxin-contaminated soils and other persistent organic pollutant (POP)-impacted materials globally. The successful outcomes of this project were later acknowledged in the USAID-commissioned Environmental Assessment for Bien Hoa, dated 3 May 2016, further reinforcing the international recognition of EDL's capability to address complex legacy contamination through innovative, non-combustion treatment technologies.

US EPA Interim Guidance Report on the Destruction and Disposal of PFAS

The US Environmental Protection Agency released its 2024 update on the Destruction and Disposal of PFAS, a key federal guidance document that reviews the state of science and technology for managing these highly persistent contaminants. Among the evaluated technologies, the report includes ball milling as a promising emerging method for PFAS destruction. Notably, EPA scientists partnered with EDL to conduct a case study investigating the mechanochemical degradation of PFAS using EDL's proprietary ball milling technology. This collaboration provided direct experimental data and validated performance insights, contributing to the broader scientific understanding of PFAS treatment methods. EDL's involvement in this official US federal publication affirms the credibility, relevance, and international recognition of its mechanochemical expertise in tackling complex environmental contaminants.

CONCAWE Report: PFAS Soil Treatment Processes - A Review of Operating Ranges and Constraints

EDL contributed to the EU-Commissioned CONCAWE report in 2024, showcasing its pioneering application of ball milling technology in the effective destruction of PFAS, alongside other POPs. This contribution underscored EDL's role in advancing sustainable solutions for environmental challenges posed by these hazardous substances, highlighting the efficacy and versatility of mechanochemical processes in waste treatment and remediation strategies.

3.4.2 Select Current Projects

US DoD Scaling up PFAS Destruction in Soil using MCD

EDL is currently executing a 2.5-year research and development programme fully funded by the United States Department of Defense (US DoD) through its Environmental Security Technology Certification Program (ESTCP). The primary objective of this project is to demonstrate the scalability and field applicability of EDL's proprietary MCD technology for the destructive treatment of PFAS in highly contaminated soils.

This R&D programme includes a comprehensive feasibility study encompassing both technical and commercial aspects, with the aim of validating the mechanochemical process under

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conditions representative of large-scale remediation. This effort also involves detailed process optimisation to enhance treatment efficiency and cost-effectiveness, generating critical data to support future implementation of MCD in full-scale remediation projects across US DoD sites. The project reflects the growing recognition of MCD as a viable and sustainable non-thermal solution for addressing persistent PFAS contamination in complex environmental matrices.

MPI Mussel Shell Valorisation

Since 2021, EDL has been advancing a waste-to-value initiative aimed at transforming waste mussel shells into high-purity ground calcium carbonate (GCC) through our proprietary MCD technology. This high-efficiency grinding process enables the conversion of hard mineral wastes into micron-scale powders suitable for commercial use. Co-funded by the Ministry for Primary Industries (MPI), the project supports New Zealand's circular economy goals by offering a sustainable alternative to landfill disposal and creating a renewable, non-mined material. The successful completion of Phase 1 provided clear proof-of-concept, confirming the technical viability of producing GCC from mussel shell waste.

The project has since progressed to Phase 2, also supported by MPI through the Sustainable Food and Fibre Futures (SFFF) fund. This phase focuses on refining the full end-to-end process, including optimisation of the MCD grinding process, evaluation of supporting systems, product performance testing, and market viability studies. Detailed engineering design is also underway to support the development of a commercial-scale processing facility. Successful delivery of Phase 2 will pave the way for plant deployment at an appropriate location and set the foundation for market acceptance of this sustainable waste solution.

3.5 Industry Recognition

WasteMINZ Award for Excellence 2025

EDL was awarded the WasteMINZ Award for Excellence 2025 in the category of Most Sustainable / Innovative Waste Disposal Initiative for our pioneering work in harnessing the potential of mechanochemistry to address complex waste challenges. Our approach offers a safe, efficient, and sustainable solution for treating hazardous materials—eliminating persistent pollutants and converting waste into valuable resources. By applying advanced mechanochemical processes, EDL delivers scalable and cost-effective alternatives to traditional disposal methods, significantly reducing environmental impact while promoting circular economy outcomes.

Royal Society of Chemistry, Award for Best Paper 2023

EDL was received the Royal Society of Chemistry's Outstanding Paper Award for 2023 in Environmental Science: Advances. Our research article was recognised for its innovative use of ball milling to address PFAS contamination in soil and AFFF concentrates. Collaborating with experts from the University of Auckland and the USEPA PFAS Innovative Treatment Team, including Prof Jon Sperry, Dr Cameron Weber, Dr Erin Shields, and Dr Andrew Whitehill.

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4. Proposed Pilot Trial

With significant expertise developing novel and effective solutions for complex waste streams, EDL proposes to conduct a targeted pilot trial for asbestos and ACM at HCC's Silverstream Landfill located in the Wellington Region. The high-level objectives of this work will be two-fold:

- Determine the configuration of an MCD treatment plant, focusing on the number of continuous flow cascading reactors required to achieve designated treatment goals.
- Perform a feasibility study to establish CAPEX / OPEX requirements for a full-scale operational plant to be implemented at the Silverstream Landfill.

Successful trials to date have been completed at bench-scale and intermediate pilot-scale. Therefore, EDL intends to deploy a single or dual MCD reactor system, which will be operated in semi-continuous and continuous mode. It is important to note that EDL has already been granted permission from the local authority to conduct this trial. No further consenting is required at this time.

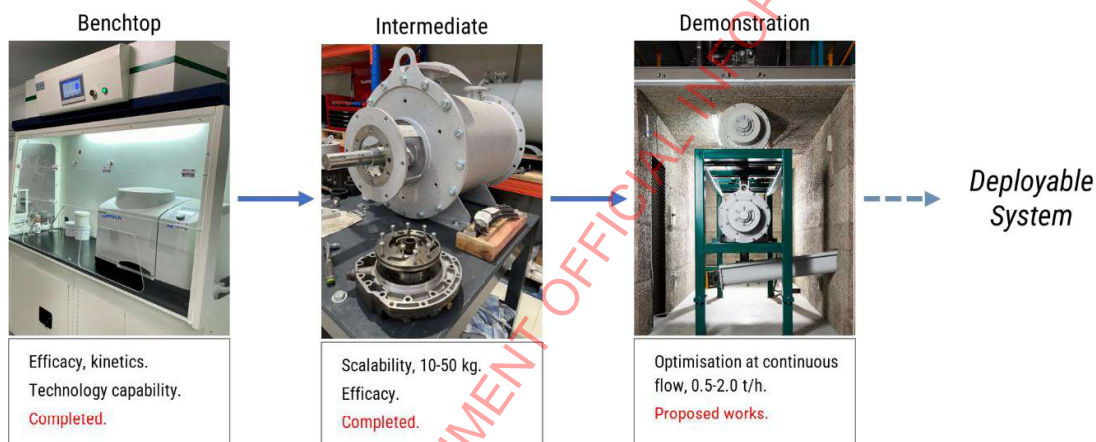


Figure 4. Various scales of EDL's MCD devices.

4.1 Technical Approach

The proposed validation project will comprise six major tasks:

1. **Develop and finalise demonstration trial plan.** Finalise the scope, objectives, and methodology for the validation trials. This includes confirming test parameters, treatment objectives, health and safety protocols, and performance metrics, in consultation with project partners and stakeholders.
2. **Equipment preparation and acquisition of ACMs.** Prepare all necessary equipment, including calibration, upgrades, or modifications to the mechanochemical plant. Secure and characterise one target cementitious ACM to ensure representative and compliant trial conditions. It is envisaged that up to 1 tonne of ACM will be treated as part of the proposed trials.
3. **Plant installation and commissioning.** Install the mechanochemical pilot treatment system at the designated site. Commissioning activities will verify system functionality, ensure safety compliance, and establish baseline operating conditions ahead of pilot trials.

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4. **Pilot trials and sample analysis.** Conduct pilot-scale treatment trials on ACMs using defined parameters. Collect samples before and after treatment, dispatch them for independent laboratory analysis, and assess data to evaluate treatment efficacy, and compliance with regulatory thresholds.
5. **Plant decontamination.** Upon completion of trials, the plant will undergo thorough cleaning and decontamination. This ensures safe handling, prevents cross-contamination, and prepares the system for future use at Silverstream or relocation.
6. **Data analysis and reporting.** Document and report on all trial activities, results, and findings. The final report will include performance assessments, compliance outcomes, operational learnings, and recommendations for commercial-scale implementation.

While there may be some overlap between these tasks, they will be seen as discrete components with their own respective objectives. The development of the demonstration plan described below is based on EDL's ~20 years' experience of scaling up the MCD technology to address complex waste issues. Relevant stakeholders that will be consulted during the development works include WorkSafe, Ministry for the Environment, and the Environmental Protection Agency.

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5. Schedule of Tasks

It is envisaged that the MCD trial programme will take up to 9 months to complete, from the development of the demonstration plan to final reporting. Major project tasks are shown in Table 1.

Table 1. Project Gantt chart.

Task	Month								
	1	2	3	4	5	6	7	8	9
1. Develop and finalise demonstration trial plan									
2. Equipment preparation and acquisition of ACMs									
3. Plant installation and commissioning									
4. Pilot trials and sample analysis									
5. Plant decontamination									
6. Data analysis and reporting									

The reports to be completed and submitted to HCC are outlined below.

- Demonstration Plan: a draft version of the plan will be submitted to HCC prior to the commencement of major technology validation activities. Time will be allocated for review and potential amendments.
- Technical Report: a draft version of the final report will be submitted to HCC at the closure of the project timeline. The report will then be finalised following HCC's review, with amendments made as necessary.

In addition to providing above reports in accordance with best practice for a technology demonstration, EDL will disseminate data, progress updates, and learnings every 1-2 months via meetings which may be suitable for online platforms (e.g., Microsoft Teams, Zoom).

5.1 High Level Cost Breakdown

The total cost for this R&D programme is estimated to be \$979,000.00, of which \$365,000.00 is sought as a contribution from HCC. Company salaries equating to \$135,000.00 will be contributed in-kind by EDL. Utilisation of EDL's R&D facility in Auckland, New Zealand will facilitate the progression of the research programme, especially in terms of fabrication and assembly of unique MCD apparatus for trials.

EDL requests that HCC's total cost be spread across the 9-month timeline of the project, as outlined below:

- 50% of the total cost (\$182,000.00) to be released at the commencement of the project to cover costs related to equipment preparation, subcontractors, and overall project management.
- 30% of the total cost (\$109,000.00) to be released upon delivery of equipment to the Silverstream Landfill site.
- 20% of the total cost (\$73,000.00) upon delivery of final report.

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6. Expected Outcomes

Utilising EDL's pilot MCD system, it is envisaged that the outcomes of the project will sufficiently profile a scalable technological solution for the destruction of asbestos and ACM at requisite throughput rates that are relevant to landfill sites, like Silverstream. The major outcome of this work will be the technological development of MCD as a nonthermal destruction technique that can indiscriminately destroy asbestos / ACM received by landfills.

Furthermore, the MCD technology may be applied to other priority areas upon the completion of the proposed investigation, including the destruction of PFAS in AFFFs, spent sorbents containing PFAS, complex liquid wastes, and other hazardous wastes.

6.1 Benefits

The benefits below not only relate to the proposed pilot trial, but also to a plant either at or proximate to the Silverstream Landfill that is capable of processing industrial tonnages of asbestos or ACMs.

Potential Environmental Benefits

- Reduction in greenhouse gas emissions through the diversion of waste from disposal pathways.
- Lower emissions associated with landfill operations and the deferral of new landfill development.
- Enhanced biodiversity outcomes through the long-term avoidance of landfilling.
- Preservation of limited landfill capacity for truly non-recoverable residual waste.
- Decreased handling and disposal of hazardous or harmful substances to landfill.
- Less environmental pollution due to reduced release of contaminants.
- Reduced transport-related emissions by eliminating the need to ship complex waste streams to distant or offshore facilities.
- A practical demonstration of circular economy principles in action.

Potential Council Benefits

- Deferred or reduced capital expenditure associated with future landfill development.
- Postponement of costs related to identifying and establishing new waste disposal solutions.
- Potential for councils to generate additional revenue by applying gate fees to waste streams that might otherwise be diverted.
- Partnerships with universities and research institutions can drive applied research in waste innovation, materials science, and clean technologies—potentially unlocking new commercial opportunities.
- Reinforces leadership in sustainability, climate action, and the transition to a resilient regional economy.
- Creates avenues for constructive public engagement and community support.

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***Potential City Benefits***

- Potential for Lower Hutt to have a world-leading asbestos / ACM treatment plant.
- Opportunities for local businesses to gain revenue and hire skilled labour due to the specialised supply chain required by EDL.
- Opportunities for local businesses to harness the unique capabilities offered by EDL and their technology.
- The recovery of potentially valuable outputs from the EDL process could enable the creation of local resale markets or establish new product lines.
- Local organisations have an option to dispose of harmful waste sustainably.
- Byproducts from the EDL process could be used by other nearby industries to create circular economy linkages.
- Educational opportunities for schools, universities and other institutions to see sustainable development technology in action.
- Rebranding Lower Hutt as a hub for green technology, industrial innovation and environmental leadership - thereby supporting tourism, talent attraction and further investment.

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Appendix A

Literature - Mechanochemical Treatment of Asbestos

While the focus of most academic MCD research has historically been directed toward treating organic pollutants, several research groups have published work related to the degradation of asbestos and ACM by HEBM. The research described herein was led by Plescia, Colangelo, Trapass and Gock.

Centrifugal and planetary ball mills are commonly utilised in laboratory benchtop-scale research. Generally, the target asbestos or ACM is placed into a jar containing a designated number of ball bearings. The jar and balls can be composed of various materials depending on the application. Common composition materials include stainless steel, hardened steel, zirconium oxide, silicon nitride, and agate. The jar containing the asbestos or ACM and ball bearings is secured into the ball milling device and operated at high speeds to rapidly pulverise the matrix.

There is a considerable amount of evidence at the laboratory scale that fibrous asbestos can be completely transformed into an amorphous powder by mechanochemical milling. The most notable trials were carried out at the Italian National Research Council (Consiglio Nazionale delle Ricerche, CNR).

Plescia et al. (2003). Mechanochemical treatment to recycling asbestos-containing waste. Waste Management 23.

This work has been recognised as the benchmark for scientific evidence supporting the concept that mechanochemical milling can lead to the total destruction / amorphisation of asbestos in cementitious waste as well as friable asbestos. The central idea behind this work was the phenomenon that mechanochemical treatment of crystalline substances can lead to an extremely high degree of amorphisation and phase change, generally seen in thermal reactions exceeding 1,000°C. An interesting observation as mechanochemical processes generally do not exceed 150°C-170°C at operational scales relevant to this work.

Plescia and colleagues' employed phase contrast microscopy (PCM) and scanning electron microscopy (SEM) to show that no asbestos fibres remained between 4-12 minutes of milling, depending on the type of asbestos. X-ray diffraction (XRD) analysis of the post-milled powders also revealed the absence of diffraction peaks characteristically seen in asbestos samples. Cumulative analytical results from PCM, SEM, and XRD tests verify that ACM can be transformed to non-carcinogenic amorphous powders.

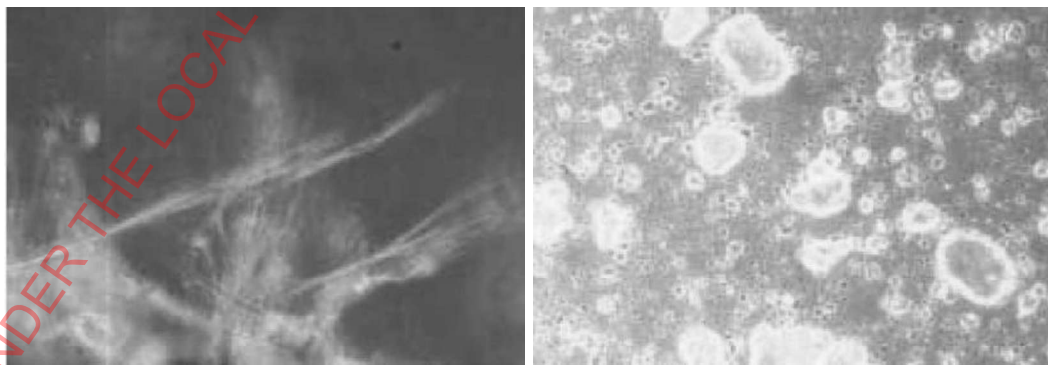


Figure 5. Phase contrast microscopy of ACM before milling (left) and after milling (right). Plescia et al., 2003.

Plescia and colleagues postulated the commercial viability of mechanochemical milling for ACM, as opposed to thermal treatment: "[Analytical results] for all waste samples confirm the possibility to

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use mechanochemistry as a fast and economic process for asbestos treatment.” They go further by concluding that “the mechanochemical process can be successfully applied to [ACM] on an industrial scale.”

Colangelo et al. (2011). Treatment and recycling of asbestos-containing waste. Journal of Hazardous Materials 195.

In 2011 Colangelo colleagues replicated the 2003 Plescia study and went on further to test the suitability of recycling post-milled powders to make up the mineral component in building materials. This paper provides strong evidence demonstrating that asbestos-free milled powders are suitable for use in a variety of civil engineering applications, specifically cements and mortars.

The main reasons that milled powders are appropriate for reuse in cements and mortars are: (1) suitable chemical and mineralogical composition; (2) superior mechanical performance of mortars containing milled powders; (3) accelerated initial hydration kinetics, related to curing time; (4) and a high degree of powder fineness suggests it can be used as artificial aggregate for specialised applications.

While Colangelo and coworkers also demonstrated that mechanochemical milling of ACM can lead to amorphous powders, they additionally showed that the resultant powders can be utilised as valuable cement and mortar additives; outperforming other mineral additives currently used in industry. Their closing statement expresses the promise of mechanochemical treatment of ACM and its recyclability: “This study leads to the conclusion that powders obtained through the high energy milling of asbestos-cement waste are asbestos-free and can be profitably recycled in the field of building materials.”

Trapasso et al. 2012. Asbestos waste carbonation: a new asbestos treatment with CO₂ recovery. Crete 2012: 3rd International Conference on Industrial and Hazardous Waste Management.

Trapasso and coworkers extended CNR’s research by showing that the treated ACM can be used for carbon capture: *“The paper reports a new preparation process of materials made of magnesium oxide, magnesium hydroxide and magnesium carbonate starting from materials containing asbestos from natural sources (serpentine with chrysotile, ophiolites with amphiboles and asbestos of serpentine) through the use of mechanochemical high-energy mills. In the work we discuss the aspects related to the materials to be used, the mechanical activation parameters and the carbonation system in order to optimize the process and reduce the treatment costs. The method identified leads to the preparation of precursor materials usable in many chemical carbon dioxide capture process and as absorbent and dehydrating materials.”*

The findings of the CNR laboratory trials were qualitatively confirmed by Auckland University of Technology (AUT) in 2015. These trials were able to replicate the CNR results using similar milling conditions. Rapid destruction was achieved, showing 100% asbestos amorphisation of ACM products (deteriorated wall panels in this case).

Gock et al. 1994. Verfahren zur Aufbereitung von faserstoffhaltigen Materialien. (Translation: Method for processing fibrous materials). German Patent No. 4332031.

A German patent from 1994 describes a process for the mechanochemical treatment of fibrous material, namely asbestos. This method was briefly described in a minerals engineering paper from 2009, which included a picture of the mechano-thermal pilot plant.¹² A vibratory mill was used to

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destroy asbestos fibres, while the thermal treatment aspect of the process is not discussed in any detail. While the results were extremely positive and material reuse was demonstrated, this patent was cancelled in 2002 due to non-payment of the annual fee. No additional or more recent information can be garnered following the termination of the patent.

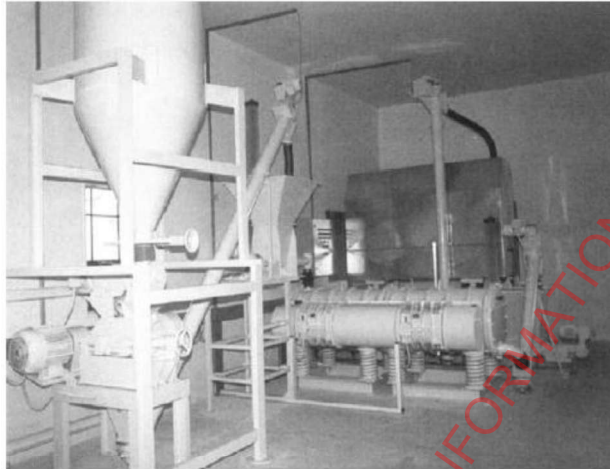


Figure 6. Mechano-thermal asbestos pilot plant using a vibratory ball mill from the mid-1990s.

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Appendix B

MCD of ACM: 2015 and 2016 Pilot-Scale Trials

Using the MCD technology, pilot-scale ACM amorphisation trials were conducted in 2015 and 2016. The work was carried out by EDL at an existing landfill site operated by EnviroServ Waste Management (EnviroServ) in Johannesburg, South Africa. This site was selected for logistical purposes, as it was already an excellent source for a variety of ACMs.

These initial pilot scale trials can be divided into three discrete investigations, based on their overall objectives and reactor development:

- 2015 Pre-Trial - preliminary investigation carried out by EDL and EnviroServ.
- 2015 Trial - EDL explored the scalability potential of the MCD technology to treat ACM; in other words, can we replicate degradation results observed in the laboratory trials as described in the literature.
- 2016 Trial - EDL used the results and outcomes from the 2015 trial to further develop the testing methodology and enhance the reactor system.

Tauw Group BV Netherlands (Tauw) collaborated with EDL as an external consultant during the 2015 and 2016 trials, to determine whether the MCD process is an appropriate technology for the treatment of asbestos and ACM. As an experienced consultancy firm and specialists in waste management, Tauw were able to provide an onsite specialist technician to independently verify and validate the MCD process and carry out an appropriate sampling procedure.

2015 Pre-Trial Overview

In May 2015, EDL and EnviroServ carried out a basic milling procedure to degrade ACM using a single reactor MCD setup. This trial was conducted to establish if any asbestos amorphisation occurred in the MCD reactor, and if so, to what extent.

Selected samples were sent to SGS South Africa (Pty) Ltd in Johannesburg. SGS are a specialist environmental testing laboratory, certified to carry out asbestos testing. Each sample was analysed by SEM coupled with energy dispersive x-ray (EDX) spectroscopy for asbestos presence and identification.

2015 Pre-Trial Results

Analytical results for the 2015 MCD pre-trial are outlined in Table 2, while a brief explanation of the results is provided below. A copy of the analytical transcript is attached as Appendix B.

Table 2. 2015 Pre-Trial Results.

	Run 1	Run 2
Before MCD	AFD	AFD
After MCD	NAFD	NAFD

Notes:

1. **NAFD** = No Asbestos Fibres Detected. **AFD** = Asbestos Fibres Detected.

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SEM / EDX analysis did not detect any residual asbestos fibres in both treated samples. This shows that fibrous asbestos was transformed into amorphous powder. Furthermore, SEM results indicate the total amorphisation of asbestos fibres going through the MCD process. Agglomerates can also be observed in the SEM photos. These agglomerates were made up of extremely fine particles, which was also observed in later trials.

2015 Trial Overview

In line with the pre-trial, the overall experimental procedure was relatively straightforward, allowing for rapid analysis of samples and quick summation of results. Standard operating conditions were determined from EDL's past experience with the MCD technology, as well as comprehensive analysis of health and safety protocols for working with asbestos.

Two types of ACM were subjected to the MCD process. ACM Type 1 originated from roof sheeting and ACM Type 2 comprised of building panels. The composition of these ACMs are shown in Table 3 below.



Figure 7. 2015 trial setup at EnviroServ's landfill site in Johannesburg, South Africa.

Table 3. 2015 ACM Sample Composition.

	Chrysotile (%)	Crocidolite (%)	Origin
ACM Type 1	10 – 15	0.1 – 2	Roof Sheeting
ACM Type 2	10 - 15	5 - 10	Building Panel

Notes:

1. Percentage of asbestos type in ACM, given as proportion of total ACM mass (m/m).

It was imperative that the reactor was sufficiently prepared prior to feeding ACM through the MCD process. The reactor speed was set to an optimum rate and pre-heated to 140°C - 150°C with silica sand. Resultant silica discharge was weighed to ensure all silica was expelled from the reactor.

Crushed ACM (less than 10 cm in length) was then fed into the reactor inlet. The reactor's outlet valve was flushed with the treated material immediately before collecting samples in approved glass jars. Samples were collected every 15 minutes for up to 60 minutes. 5 trial runs were conducted in total.

Selected samples were sent to RPS Laboratories in the Netherlands. RPS is a specialist asbestos testing laboratory, certified by the Accreditation Council (NEN-EN-ISO / IEC 17025). Each sample was analysed by SEM coupled with EDX spectroscopy for asbestos presence and identification.

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2015 Trial Results

Analytical results for the 2015 MCD pilot trial are outlined in Table 4, while a brief explanation of the results is provided below. A copy of the analytical transcript is attached as Appendix C.

Table 4. 2015 Trial Results.

	Run 1	Run 2	Run 3	Run 4	Run 5
ACM Type	1	1	2	1	1
ACM Mass (kg)	9.20	9.25	10.0	10.0	20.0
0 - 15 mins	NA	NA	NA	NA	NA
15 - 30 mins	NA	NA	NA	NA	NA
30 - 45 mins	NA	NA	NA	NA	NA
45 - 60 mins	AFD	AFD	AFD	AFD	AFD
60 - 90 mins	-	-	-	NA	NA
90 - 120 mins	-	-	-	NA	NA

Notes:

1. NA = Not Analysed.
2. NA = No Asbestos Fibres Detected. AFD = Asbestos Fibres Detected.

Only the 45-60 minute samples were sent for analysis, in order to obtain indicative results quickly. SEM / EDX results revealed that fibrous asbestos destruction between 80.0% and 99.3% was taking place within the reactor. While some asbestos fibres were detected in the sample matrices, there was a significant reduction in the overall percentage (wt%) of remaining asbestos fibres in the samples.

Further analysis of the 45-60 minute samples revealed that crocidolite fibres were not detected in Runs 1, 3, and 4; indicating 100% destruction of crocidolite fibres in these 'Runs'. Furthermore, the overall percentage of chrysotile asbestos had decreased from 10-15% to 0.1-2% in all samples. Inadequate processing / mixing or cross-contamination may have led to the observed results.

SEM photos showed that large asbestos fibres remained after going through the reactor. This is a clear indication that some fibres are not being subjected to the milling process and were likely accumulating at the collection valve where no balls can collide with matrix particles.

Mechanical operating issues prevented further trial runs. Subsequently, it was envisaged that the reactor system would be inspected and modified for later trials. This work would be done to enhance ACM destruction.

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2016 Trial Overview

The major variations between the 2015 and 2016 trials were a result of continuous development of the MCD reactor for asbestos degradation, as well as development of the operating method.

The basic 2015 trial procedure outlined above remained the same for the 2016 trial, except for the amendments summarised below:

- A bespoke reactor closing cap was made to cover the cavity left after the return auger system was removed from under the discharge valve.
- A discharge drum was added for dust-free sample collection.
- An infeed drum with sliding gate valve for easy loading was added. This appendage for loading only. It was appropriately sealed when the reactor was in operation.
- A ball valve was installed adjacent to the infeed. A ½ inch outlet was piped through a water container bubble system. This was done as a precaution to aid ventilation if needed.
- The most significant change was simulating a multi-reactor (or stacked) system. This was done by collecting the discharged material and manually returning the treated ACM to the infeed, to be processed again. Samples for analysis were taken before returning the treated material to the infeed drum. This was done in 15-minute intervals.
- An inert mineral additive (ADD1) was added to the treated material in the collection drum before re-entering the reactor via the infeed drum. The amount of additive was different in each of the runs, ranging from 0 - 20% (wt%).

General maintenance was also carried out. This included replacement and bedding of gland packing and examining reactor integrity.



Figure 8. Discharge drum (top left); crushed ACM (bottom left); infeed drum (right).

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Again, two types of ACM were subjected to the updated MCD process. ACM Type 3 originated from cement piping and ACM Type 4 comprised of cement roofing. The composition of these ACMs is shown in Table 5 below.

Table 5. 2016 ACM Sample Composition.

	Chrysotile (%)	Crocidolite (%)	Origin
Re-Run	0.1 - 2	0.1 - 2	Treated 2015 ACM
ACM Type 3	10 - 15	2 - 5	Cement Piping
ACM Type 4	10 - 15	2 - 5	Roof Sheeting

Notes:

1. Percentage of asbestos type in ACM, given as proportion of total ACM mass (m/m).

In total, 4 trial runs were carried out in 2016, including a re-run of material from the 2015 trial. This 're-run' comprised of treated ACM from Run 1 and Run 2 of the 2015 trial. Selected samples were sent to SGS South Africa (Pty) Ltd in Johannesburg. SGS is a specialist environmental testing laboratory, certified to carry out asbestos testing. Each sample was analysed by SEM coupled with EDX spectroscopy for asbestos presence and identification.

2016 Trial Results

Analytical results for the 2016 MCD pilot trial are outlined in Table 6, while a brief explanation of the results is provided below. A copy of the analytical transcript is attached as Appendix D.

Table 6. 2016 Trial Results.

	Re-Run	Run 1	Run 2	Run 3
ACM Type	Re-Run ACM	3	3	4
ACM Mass (kg)	10	10	10	10
0 - 15 mins	NA	AFD	AFD	AFD
15 - 30 mins	NAFD	NAFD	AFD	AFD
30 - 45 mins	NAFD	NAFD	NAFD	NAFD

Notes:

1. NA = Not Analysed.
2. NAFD = No Asbestos Fibres Detected. AFD = Asbestos Fibres Detected.

SEM / EDX analysis did not detect any residual asbestos fibres in all of the 30-45 minute samples. This shows that all fibrous asbestos is transformed into amorphous powder by 45 minutes; or in other words, all asbestos is degraded after flowing through 3 MCD reactors. The addition of the inert additive

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appears to have significantly increased degradation of residual asbestos fibres. Further testing is required to evaluate the effect and necessity of additives.

Total amorphisation occurred at different time intervals. The 'Re-run' and 'Run 1' samples returned no traces of asbestos fibres in the 15-30 minute samples. The samples which revealed the presence of asbestos fibres ('Run 1' 0-15 minutes; 'Run 2' and 'Run 3' 0-15 and 15-30 minutes) may have a lower asbestos concentration, however EDL could not quantitatively measure exactly how much asbestos remained.

SEM photos clearly show the total amorphisation of asbestos fibres going through the MCD process, demonstrating the effectiveness of MCD in 100% fibrous asbestos destruction.

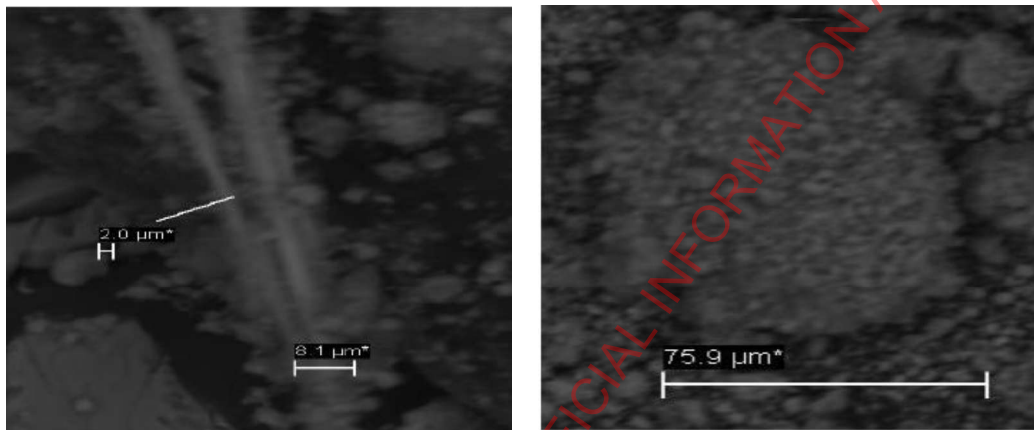


Figure 9 SEM of representative 'Run 4' matrix. 0-15 minute sample (left) and 30-45 minute sample (right). Complete amorphisation is achieved by simulated multi-reactor MCD trial.

Discussion: Pilot-Scale Development

The waste industry is continuously exploring pathways to develop technological solutions and innovative recycling options for asbestos challenges related to demolition waste containing vast amounts of ACMs. EDL's MCD process presents an attractive recycling technology, capable of completely degrading ACM into an inert by-product that can be reused in civil engineering applications, such as the mineral component of cementitious building materials.

Published research in high energy milling has always been at the laboratory scale, with promising results showing rapid asbestos amorphisation. EDL's MCD process demonstrates the first trial to provide evidence showing that the same degree of asbestos amorphisation can be scaled up.

The results outlined in this section demonstrate the suitability and effectiveness of EDL's MCD reactor technology for the degradation of asbestos in a variety of ACM. Although this body of research was carried out at a pilot scale capacity, the capabilities of scaling up the process have been well established by EDL's previous experience and knowledge with full scale soil decontamination work.

The fundamental milling parameters and conditions in the 2015 trial were chosen to achieve high asbestos destruction rates. However, engineering issues were encountered, leading to the modification of the MCD reactor and adjustment of methodology for the 2016 trial. This process development and mill tuning stage proved successful: no asbestos fibres were detected in the 30-45 minute samples of all the 'Runs' in the 2016 trial.

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The two major contributing factors which led to the increased rates of degradation in the 2016 trial were: (1) simulating a multi-reactor system, and (2) the addition of a naturally occurring inert additive to the ACM matrix. However, additional testing is required to assess the overall effectiveness of additives and the underlying mechanism.

Simulating a multi-reactor system had the obvious advantage of increasing the exposure of the ACM matrix to the high energy destructive environment within the reactor mill. This was an ideal procedural adjustment, as a multi-reactor (or stacked) system is a more realistic representation of a real-world operational plant. EDL estimates that 90% of asbestos degradation would take place in the first reactor, with subsequent reactors treating residual asbestos fibres which can be hard to treat.

The addition of the inert additive in the 2016 trial also led to enhanced degradation rates. This trial demonstrated that the addition of the inert additive increases the energetic environment within the MCD reactor. The fractured additive surfaces, which occur because of multiple ball-to-surface collisions within the reactor, create reactive sites which can transfer relatively large amounts of energy to asbestos fragments. This process ultimately leads to the breakdown of asbestos' crystalline structure. The final breakdown products for the degradation of ACM are the inert mineral constituents which make up ACM, with no fibrous morphology.

Conclusion: Pilot-Scale Development

The objectives of these trials were to assess the capabilities of the MCD process in degrading asbestos, and to demonstrate its scalability to effectively recycle asbestos and ACM as an appropriate technological solution. Furthermore, it was EDL's aim to link published laboratory scale experiments with the pilot scale trials carried out in 2015 and 2016. To EDL's knowledge, this is the first investigation to successfully replicate and validate published ACM degradation data at a scale potentially capable of meeting the demands of industry.

Although the 2015 trial 'Runs' did not realise the full destructive ability of MCD, it effectively informed on future modifications to the reactor and amendments to the overall procedure, in order to achieve enhanced amorphisation. The 2015 trial also revealed potential sources of cross-contamination and developed EDL's understanding of how ACM travels through the reactor.

Taking outcomes of the 2015 trial into consideration, modifications and adjustments were implemented for the 2016 trial. The results were extremely positive: total asbestos amorphisation was observed in all of the 'Runs' of the 2016 trial. ACM exposure to the destructive environment within the reactor was achieved by simulating a multi-reactor system. A naturally occurring inert material was also added in various concentrations to provide highly reactive surfaces after fracture. Cumulatively, these changes led to complete ACM degradation within 45 minutes for all samples.

The conclusive outcomes of the 2015 and 2016 pilot trials demonstrate that complete and rapid amorphisation of fibrous asbestos in cementitious materials can be achieved using EDL's MCD technology. In addition, asbestos degradation rates are significantly enhanced by using a (simulated) multi-reactor system, as well as exploiting the reactivity of the milled additive.

This body of work has summarised the fundamental research and development EDL are conducting in its continuous advancement of the MCD technology for ACM degradation. The outcomes of this work have clarified objectives for future method development and research. Data obtained from this research and information found in the literature show that MCD is a viable degradation method for ACMs.



Memorandum

To:	Alison Geddes Director, Environment & Sustainability
Paper author:	Andred Saker Senior Advisor, Resource Recovery
Approved by:	Jörn Scherzer Head of Climate, Waste & Resource Recovery
Subject:	Funding for EDL Asbestos Treatment Pilot at the Silverstream Landfill

Purpose

1. This memorandum seeks your approval to provide funding of \$365,000 to Enviromental Decontamination (NZ) Ltd for the purpose of undertaking a pilot of their asbestos treatment technology at the Silverstream Landfill.

Recommendation

2. That you approve:

A funding investment of \$365,000 to Enviromental Decontamination (NZ) Ltd for the purpose of undertaking a pilot of their asbestos treatment technology at the Silverstream Landfill.

Background

Asbestos disposal at Silverstream Landfill

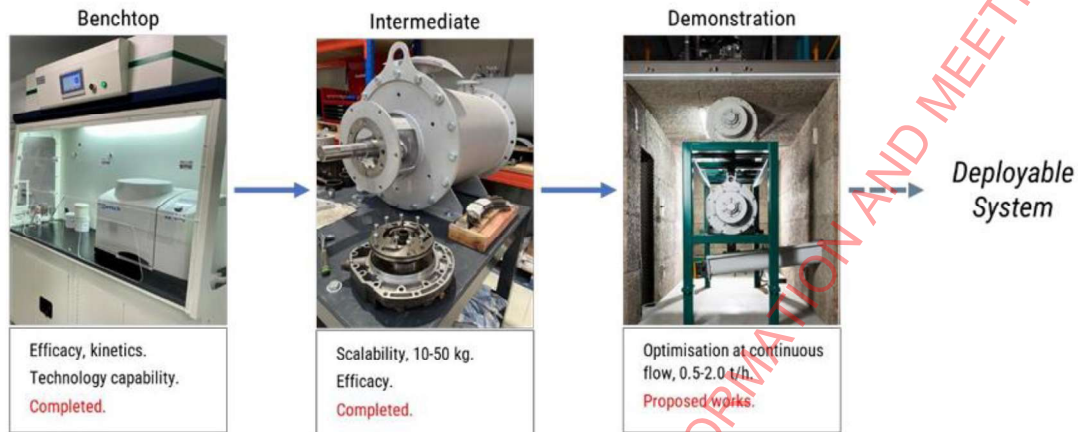
3. Silverstream Landfill receives approximately 150,000 tonnes of general waste annually and is one of the few landfills in the North Island that accepts asbestos and asbestos containing materials (ACMs) for disposal.
4. Asbestos is a naturally occurring group of six fibres that have been used historically for their strength, fire resistance and insulating properties in the building and construction industry.
5. When disturbed, the fibres can be released into the air and inhaling them can cause serious health problems, including lung cancer, mesothelioma and other lung/respiratory conditions.
6. The disposal of asbestos and ACMs is problematic due to the hazardous nature of the waste and the large volumes/tonnages involved – as highlighted in the table below:

Year	Material	Tonnage Received
2022/23	Asbestos	4,756
2023/24	Asbestos	2,109
2024/25	Asbestos (inc. asbestos containing soil)	1,918

Environmental Decontamination Limited

7. Environmental Decontamination Limited (“EDL”) is a New Zealand owned and based R&D company that have been developing contaminant remedial technology for the past 20 years.
8. EDL aims to provide cost-effective ways to neutralise the harmful effects of industrial loads of asbestos, ACMs and other recalcitrant waste contaminants.
9. The present focus of EDL is to develop and commercialise a patented, world-leading mechanochemical process to turn asbestos and ACMs into an inert, amorphous powder that can be re-used a filler for “green” concrete.

10. The technology has been validated by world class laboratories in the USA and Europe, but a practical demonstration (i.e. a pilot) is required before it can be scaled up for industrial tonnages of asbestos and ACMs.



The Pilot

11. The pilot consists of installing two modified 40-foot containers that will house the plant & equipment required for the pilot in a dedicated area at Silverstream Landfill.
12. The plant & equipment will not operate continuously over the period of the pilot but rather intermittently when different loads of asbestos and ACMs are processed and the outputs sent to the USA for laboratory analysis.
13. On 23 May 2024, a Memorandum of Understanding (MoU) was signed between EDL and Council that enabled the 6-12 month pilot to begin in early to mid-2025. *For ease of reference, the MoU mentioned above is attached as part of Document 21.*
14. The pilot was to be jointly funded by EDL and the UK Government's Nuclear Decommissioning Authority and according to EDL has a cost of approximately \$5 million to date.¹
15. The Nuclear Decommissioning Authority withdrew funding as part of a suite of cost-cutting measures by the UK Government in early 2025 which resulted in the pilot being suspended.

¹ The funding to date has been mainly to design, build and commission plant and specialised equipment for the pilot.

16. EDL have advised that an alternative source of funding of \$365,000 is required to cover the shortfall left by the UK Government if the pilot were to continue as planned.
17. EDL have explored alternative funding sources; this includes discussions with the Ministry for the Environment (MfE) on the use of the Waste Minimisation Fund (WMF).
18. MfE advised that WMF funding is currently focused on the development of waste processing infrastructure rather than pilots and/or demonstration plants.
19. MfE did express an interest in providing WMF funding for an industrial-scale processing facility should the pilot be successful.

The Opportunity

20. EDL have signalled to Council that a successful pilot could lead to an industrial-scale processing facility in Lower Hutt – potentially located at the Silverstream Landfill site.
21. To enable such a facility, Council could fund the shortfall left by the UK Government; such an investment may result in the following benefits:

Potential Environmental Benefit	Potential Council Benefit	Potential City Benefit
Reduced greenhouse gas emissions from the avoidance of waste disposal (landfill operations) and delayed landfill development. Avoided biodiversity loss from additional landfill development in the future Conservation of existing landfill airspace for residual waste that cannot be diverted.	Reduced/delayed landfill development costs. Delayed costs associated with identifying future ways of waste disposal. Opportunity for Council to increase revenue by charging gate rates for waste that may have been alternatively disposed of. Collaboration with universities and public research organisations could foster applied	Potential for Lower Hutt to have a worldclass asbestos/ACM treatment plant. Opportunities for local businesses to grow and upskill due to the specialised supply chain required by EDL. Opportunities for local businesses to harness the unique capabilities offered by EDL and their technology. The recovery of potentially valuable outputs from the EDL process could enable

Less harmful materials and substances being handled and subsequently disposed of to landfill. Less pollution and contaminants being discharged into the environment. Reduced transport emissions from the avoidance of transporting recalcitrant waste streams to national or international processing facilities. Tangible example of a circular economy.	research on waste solutions, materials science and clean technology etc. – which in turn could lead to further business development. Strengthened commitment to sustainable development, climate action and regional economic transformation. Opportunities for positive public engagement.	the creation of local resale markets or establish new product lines. Local organisations have the option to dispose of harmful waste sustainably. Byproducts from the EDL process could be used by other nearby industries to create circular economy linkages. Licensing and/or franchising interest from other organisations or jurisdictions in EDL's technology. Educational opportunities for schools, universities and other institutions to see sustainable development technology in action. Promoting Lower Hutt as a hub for green technology, industrial innovation and environmental leadership – thereby supporting talent attraction and further investment.
--	--	--

22. EDL have provided a proposal (refer to Appendix 1) that underscores the pilot with the funding shortfall covered by Council.

23. The pilot would initially process asbestos and ACMs, but the versatile nature of the technology means it can be easily adapted to process contaminants such as POPs and PFAS².

24. POPs and PFAS are some of the most difficult and harmful contaminants known to the international waste community.

² POPs – persistent organic compounds; PFAS – Perfluoroalkyl and Polyfluoroalkyl Substances (“forever plastics”)

<https://www.niehs.nih.gov/health/topics/agents/pfc>

25. Section 32 of the Waste Minimisation Act 2008 stipulates that territorial authority waste levy funds must be spent:

<https://www.legislation.govt.nz/act/public/2008/89/en/latest/#DLM1154603>

- (1) on matters to promote or achieve waste minimisation; and
- (2) in accordance with its waste management and minimisation plan.

26. Facilitating and funding a pilot at Silverstream Landfill aligns with the WMMP Local Action #11 [pg. 43] to:

<https://www.huttcity.govt.nz/services/rubbish-and-recycling/waste-management-and-minimisation-plan-wmmp>

"Investigate current, new and emerging technologies and/or approaches that support the future of waste disposal."

Consultation

27. In developing this memorandum, the resource recovery team have engaged with the following business units:

- Business & Economy
- Procurement (refer to Procurement Risk section)
- Legal

Risks

Financial Risk to Council

28. The financial risk to Council is minimised by having Mark Abbot from the independent consultancy Abbot Consulting undertake due diligence on EDL. <https://abbot.co.nz/>

29. The due diligence report made the following recommendation:

For ease of reference, the due diligence report mentioned above is attached as part of Document 21.

"This due diligence review process has provided no alarms or concerns regarding the initiation of a partnerships trial approach as suggested and recommends that Council proceed with this trial as proposed." [pg. 4]

30. The financial risk can be mitigated by adopting a staged approach to making payments to EDL subject to the successful completion of certain milestones:

- 50% of the total cost (\$182,000.00) to be released at the commencement of the project to cover initial costs³
- 30% of the total cost (\$109,000.00) to be released upon delivery of equipment to the Silverstream Landfill site.
- 20% of the total cost (\$73,000.00) upon delivery of final report to Council.

Reputational Risk

31. There is a possibility of negative publicity for the Council if the pilot is unsuccessful or a detrimental accident/incident occurs during the pilot that raises media or public awareness.

32. This risk cannot be eliminated, but according to the due diligence report:

"...The patented mechanochemical process that underpins EDL's technology has been independently validated by world-class laboratories and this trial of a practical application of the technology in a controlled environment is the precursor to the establishment of an industrial plant capable of processing commercial tonnages of asbestos and ACMs..." [pg. 8]

"...In addition to partnering with local universities, EDL's technology is reported in a number of leading international publications... These third-party reports appear to validate and endorse the technology..." [pg. 10]

33. Moreover, on 10 June 2025 EDL won the prestigious Waste Management Institute of New Zealand Award for Excellence for the most sustainable and innovative waste disposal initiative in New Zealand.

Operational Risks

34. Operational risks, including the health & safety of workers managing the asbestos and ACMs, have been minimised by using a collaborative approach between Council and:

- EDL as the technology provider and expert on procedures required to ensure compliance with health & safety obligations.

³ These are related to equipment preparation, subcontractors and overall project management.

- Tonkin & Taylor as the consultancy appointed by Council to oversee management of the Silverstream Landfill.
- Waste Management NZ as the company contracted by Council to operate the Silverstream Landfill.

35. The details required to facilitate the safe and efficient organisation of the pilot at the Silverstream Landfill are encapsulated in the aforementioned [MoU](#) that was signed between Council and EDL on 24 May 2024.

For ease of reference, the MoU mentioned above is attached as part of Document 21.

36. Resource management risks have been minimised by Tonkin & Taylor submitting an [Outline Plan](#) to the Council's Resource Consent team that was approved by the Council's resource consents team on 12 December 2024.

Procurement Risks

37. EDL is the world leader of mechanochemical technology and therefore is the only company in New Zealand and internationally that can undertake the pilot.

38. A [tender exemption](#) enabling EDL to be directly sourced has been reviewed and endorsed by the Procurement team.

People Implications

39. The pilot will be resourced and managed exclusively by EDL staff and therefore any wellbeing considerations will be addressed by EDL.

Financial Implications

40. If approved, the funding investment will come from the resource recovery team's waste levy funds, which are currently used to fund a range of waste minimisation projects and initiatives.

41. The value of the funding investment and the significant benefits on offer mean that reprioritisation of the resource recovery team's projects and initiatives may occur if fiscal constraints were encountered.

42. Partial funding of the investment will result in a prolonged and indefinite delay of the pilot while EDL find additional funding to cover the shortfall.

Legal Implications

43. The use of waste levy funds for the purposes of the pilot is consistent with [section 32 of the Waste Minimisation Act 2008](#)

<https://www.legislation.govt.nz/act/public/2008/89/en/latest/#DLM1154603>

44. The use of Silverstream Landfill for the pilot is consistent with the Landfill's pre-existing resource consent conditions as described in the approved [Outline Plan](#)

Technology and Privacy implications

45. The mechanochemical process that underpins the EDL technology is commercially sensitive and is protected by New Zealand and International patents to help protect against intellectual property theft.

46. The [MoU](#) includes confidentiality/non-disclosure provisions to help safeguard trade secrets and other sensitive information associated with EDL's technology. *For ease of reference, the MoU mentioned above is attached as part of Document 21.*

47. EDL have previously confirmed they will provide Council with data, results and other information relating the pilot, which may have to be withheld under [section 7\(2\)\(b\)\(ii\) of the Local Government Information and Meeting Act 1987](#) if a request is made. <https://www.legislation.govt.nz/act/public/1987/174/en/latest/#DLM122287>

Climate Change Implications

48. There are emissions associated with undertaking the pilot, but they are not considered significant.

49. As noted in the previous table, an industrial-scale plant in Lower Hutt could achieve emission savings by avoiding the need to dispose of recalcitrant waste streams to landfill or transporting waste to other national and international processing facilities.

50. An industrial plant, if located at Silverstream Landfill, could fully operate on electric power, due to Council's recent investment in a heavy-duty EV charging hub onsite.

Health, Safety and Security implications

51. The [MoU](#) requires EDL to provide Council a comprehensive health and safety plan for approval to safeguard the ongoing health and safety of all parties associated with the pilot.

For ease of reference, the MoU mentioned above is attached as part of Document 21.

52. The plant and equipment have been designed in such a way that physical handling of raw asbestos and ACMs by people is not required.

Communication and Engagement

53. Council has been providing regular updates on the intended pilot through committee papers to the Climate Change and Sustainability Committee.

Next steps

54. If you approve the funding investment, the following steps will occur:

- i. A contract between EDL and Council will be signed giving effect to the funding investment.
- ii. EDL have confirmed that once funding has been received, the plant and equipment would be transported, installed and commissioned at Silverstream Landfill over the next few months.
- iii. Council officers will liaise with EDL and WMNZ to ensure the arrival, installation and commissioning process of the plant and equipment takes place as smoothly and efficiently as possible.

Attachments

55. There are attachments to this paper:

Attachment 1: [EDL Asbestos Demonstration Full Proposal June 2025](#)

Attachment 1 has been provided as document 14 in the wider document pack.



Silverstream Landfill

**Outline Plan - asbestos destruction
technology trial**

Prepared for
Hutt City Council
Prepared by
Tonkin & Taylor Ltd

Date
October 2024

Job Number
1094936 v3.0



**Together we create and
sustain a better world**
www.tonkintaylor.co.nz

Document control

Title: Silverstream Landfill					
Date	Version	Description	Prepared by:	Reviewed by:	Authorised by:
27.09.24	1	Draft	s7(2)(a)		
18.10.24	2.0	Final for issue			
21.10.24	3.0	Updated Final for issue			

Distribution:

Hutt City Council	1 electronic copy
Environmental Decontamination (NZ) Limited	1 electronic copy
Hutt City Council (Regulatory)	1 electronic copy
Tonkin & Taylor Ltd (FILE)	1 electronic copy

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1 Introduction

1.1 Overview and background

Hutt City Council (HCC) as Requiring Authority, proposes to undertake a trial asbestos destruction programme at Silverstream Landfill. As part of this programme, Environmental Decontamination (NZ) Limited (EDL) on behalf of HCC, intends to install and use a Mechanochemical Destruction (MCD) Reactor to break down asbestos fibres. While the trial will focus on asbestos-containing materials, other contaminants may also be investigated during the trial, including environmental media containing persistent organic pollutants (POPs) and per- and polyfluoroalkyl substances (PFAS).

Under the Resource Management Act (RMA) section 176A and the District Plan designation provisions, the proposed works require an Outline Plan of works to be submitted to HCC as the regulator. Section 176A(3) requires that an Outline Plan must include the following information:

- The height, shape and bulk of the works.
- The location of the work on the site.
- The finished contour of the site.
- Vehicular access and parking.
- Proposed landscaping; and
- Any other matters to avoid, remedy or mitigate adverse effects on the environment.

Section 3 of this report describes the proposed works and Section 4 details the statutory requirements pursuant to section 176A of the RMA.

Tonkin & Taylor Ltd (T+T) has prepared this report in accordance with section 176A of the Resource Management Act 1991 (RMA).

1.2 Requiring authority and property details

Table 1.1: Requiring authority and property details

Requiring Authority	Hutt City Council
Owner of site	Hutt City Council
Site address / map reference	Reynolds Bach Drive, Stokes Valley, Upper Hutt NZTM 1767797 5441029
Site area	94.2 ha
Legal description	Section 7 Survey Office Plan 461420
Record of Title reference	626430
District Plan	HCC District Plan
Designation reference	HCC7
Designation purpose	Sanitary Landfill
Underlying zoning	Passive recreation
Address for service during processing	Tonkin & Taylor Ltd, PO Box 5271, Auckland Attention: s7(2)(a) Phone: [REDACTED] Email: s7(2)(a)@tonkintaylor.co.nz

Address for service for invoicing	Hutt City Council, 30 Laings Road, Lower Hutt Attention: Andred Saker Phone: s7(2)(a) Email: Andred.Saker@huttcity.govt.nz
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We attach copies of the relevant Record of Title in **Appendix A**.

1.3 Other approvals required

We understand from discussions with the operator, EDL, that there are no discharges as a result of the activity, including any discharges to air.

The entire Silverstream Landfill site is listed on the Greater Wellington Regional Council Selected Land Use Register (File No. SN/03/002/02). The proposed works are located in the eastern borrow area of the site which has only previously been used to obtain material to support landfill activities on the site and therefore not subject to Hazardous Activities and Industries List (HAIL) activities. As such, we do not consider that the National Environmental Standard for Assessing and Managing Contaminants in Soil (NES – Soil) to Protect Human Health applies to proposed works.

Hence, we understand that no other approvals are required.

2 Environmental setting

2.1 Site location and description

The site is the Silverstream Landfill located at the end of Reynolds Bach Drive, Lower Hutt (refer to Figure 2.1). The site is legally described as Section 7 Survey Office Plan 461420. The proposed works are to be located in the south-east corner of the subject site, as shown on the design plans in Appendix B.

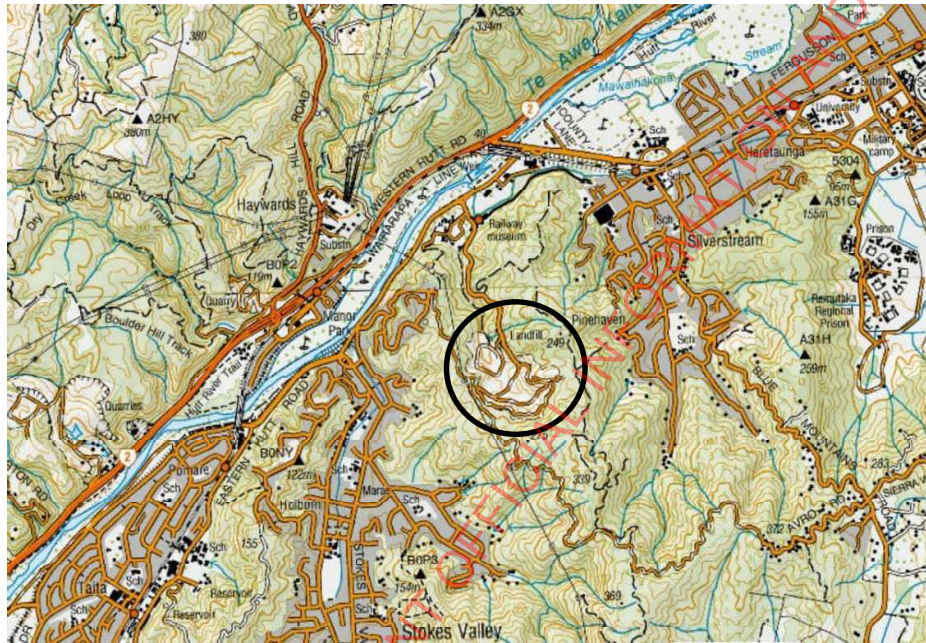


Figure 2.1 Location plan

Copyright TTMapViewer 2024

2.2 Site description

The site has been an operational landfill since the 1970s. The landfill operation is set out in stages:

- Stage 1 is the original landfill that operated at the head of the gully from the 1970s to 1998.
- Stage 1A sits above Stage 1 and was constructed between 1998 and 2009/2010. Stage 1A has a clay liner and leachate collection system. Filling in Stage 1A has ceased but this area is still used for disposal of special waste, such as asbestos.
- Stage 2 is the main area of filling down gully of Stage 1 and 1A. Filling in Stage 2 began in 2010. Stage 2 consists of a fully lined landfill, designed with a geo-synthetic plus clay lining system.

The area surrounding the landfill site is predominantly vegetated hills. Beyond this there are residential areas, with the nearest being the dwellings on Robson Street, Stokes Valley.



Figure 2.2: Aerial view of site and location of proposed works in black circleCopyright TTMapView 2024

3 Overview of proposed works

HCC intends to trial an asbestos destruction programme at Silverstream Landfill. The proposed works involve the installation and operation of a Mechanochemical Destruction (MCD) Reactor within the designated area of the landfill. The MCD Reactor, an advanced form of a conventional ball mill, will be used to break down asbestos fibres as part of the asbestos destruction trial. Other contaminated media may be investigated as part of this work.

Design plans are included in **Appendix B** and in summary the proposed works will include:

- Installation of three container building/structures with dimensions of 6.06 m (length) x 2.44 (width) x 2.89 m (height.) which will contain the MCD technology.
- Minor earthworks for the levelling and compaction of the site prior to installation of the container structures.
- Operation and use of the MCD reactor to break down asbestos fibres.

4 Statutory requirements

The proposed works will take place within Designation HCC7, designated by HCC (as Requiring Authority) for the purpose of Sanitary Landfill. The works are in accordance with the purpose of the designation.

Section 176A sets out the matters to be considered when submitting an Outline Plan. There are no conditions applying to the designation.

4.1 Outline Plan of Works – Section 176A

Section 176A sets out the matters to be considered when submitting an Outline Plan. These are outlined below.

4.1.1 Height, shape and bulk of the works

The proposed works involve the installation of three containers on the subject site with individual dimensions of 6.06 m (length), 2.44 m (width) and 2.89 m (height). These containers will be placed adjacent to each other, in a block.

4.1.2 Location on the site

The location of the site is outlined in Section 2 above and the Design Plan in **Appendix B**.

4.1.3 Likely finished contour of the site

The site will be levelled and compacted prior to the installation of the container structures. These earthworks will be limited to the immediate area where the containers are to be located. If required, erosion and sedimentation controls will be in place.

4.1.4 Vehicular access, circulation and parking

Access to the site will continue to be provided off Reynolds Bach Drive. Vehicles will use the existing roads onsite where possible to access the top of the landfill and the asbestos disposal cell area. No new manoeuvring or parking areas are proposed for the works.

4.1.5 Landscaping

No planting is proposed as the site is an operational landfill.

4.1.6 Mitigation matters

4.1.6.1 Landfill Management Plan

The Silverstream Landfill has an existing Landfill Management Plan (LMP). The LMP sets out the operation and management procedures for the landfill. Proposed works associated with the trial asbestos destruction programme will be carried out in accordance with the LMP.

A copy of the LMP can be provided on request.

4.1.6.2 Asbestos Management Plan

There is an existing Asbestos Management Plan (AMP), which Waste Management, the landfill operator, prepared for previous asbestos related works on site including the acceptance, handling and disposal of asbestos. The AMP is required under the:

- Health and Safety at Work (Asbestos) Regulations 2016.
- Work Safe Approved Code of Practice for the Management and Removal of Asbestos (2016).
- Waste MINZ 'Waste industry guidelines to manage the collection, receipt, transport and disposal of asbestos waste (2019).

The existing AMP is an operational document that sets out the practices and procedures to be implemented by Waste Management to protect human health when receiving and disposing of asbestos material onsite. This includes:

- Disposal in a special waste location.
- Personnel protective equipment.
- Excluding unauthorised access and signage.
- Unloading procedures (Hi-ab or hand unloading); and
- Air monitoring.

A copy of the AMP can be provided on request.

4.1.6.3 Noise and Vibration Effects

The operation and use of the MCD Reactor may result in adverse noise and vibration effects. However, as proposed works are fully contained within the landfill site and are not located in close proximity to sensitive activities (residential), potential noise and vibration effects will be minimal.

4.1.6.4 Landscape and Visual Effects

The container structures are limited in size and extent and will be fully contained within the boundary of the landfill. As such, works will be adequately screened from surrounding properties. The location of these types of structures are generally anticipated within landfills and are similar in design to other small, prefabricated buildings used for ancillary activities at landfills.

5 Conclusion

This Outline Plan is submitted to HCC (as regulator) under section 176A of the Resource Management Act 1991 on behalf of HCC (as Requiring Authority).

The proposed works are fully contained within the boundary of the designation HCC7 and are in accordance with the purpose of the designation.

Under section 176A(4) Council may request HCC to make changes to the Outline Plan within 20 working days of receiving the Outline Plan.

Overall, the proposed works will provide for the operation of the MCD Reactor and enable HCC to undertake the trial asbestos destruction programme at Silverstream Landfill. These works will support existing asbestos processing and disposal operations at the landfill which has economic, social and health and safety benefits for the Wellington region.

6 **Applicability**

This report has been prepared for the exclusive use of Hutt City Council, in accordance with our agreement with Environmental Decontamination (NZ) Limited dated 17 July 2024 and the particular brief given to us. It may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

We understand and agree that this report will be used by Hutt City Council in undertaking its regulatory functions in connection with this Outline Plan and the Silverstream Landfill designation.

Tonkin & Taylor Ltd
Environmental and Engineering Consultants

Report prepared by:

Authorised for Tonkin & Taylor Ltd by:

s7(2)(a)

Planner

s7(2)(a)

Project Director

Technical review undertaken by s7(2)(a), Principal Planner

21-Oct-24
\\ttgroup.local\corporate\wellington\tt projects\1094936\issueddocuments\21.10.2024 final silverstream landfill asbestos destruction trial outline plan.docx

Appendix A Record of Title

RELEASED UNDER THE LOCAL GOVERNMENT OFFICIAL INFORMATION AND MEETINGS ACT 1987



**RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
GAZETTE NOTICE**

Search Copy



R. W. Muir
Registrar-General
of Land

Identifier **626430**
Land Registration District **Wellington**
Date Registered 19 July 2013 03:06 pm
Prior References
 WNF2/115

Type	Fee Simple	Instrument	GN 9464561.1
Area	94.2073 hectares more or less		
Legal Description	Section 7 Survey Office Plan 461420		
Purpose	disposal facility		
Registered Owners	Hutt City Council		

Interests

Subject to Section 59 Land Act 1948

Subject to water supply easement in gross over part marked C on SO 461420 in favour of The Wellington Regional Council created by Transfer B253255.1 - 10.9.1992 at 9:55 am

Subject to a electricity generation and transmission easement in gross over the within land in favour of (now) LMS Energy NZ Limited created by Easement Instrument 9192765.2 - 3.10.2012 at 2:42 pm

Subject to a right of way over part marked A on DP 463973 created by Easement Instrument 9686142.1 - 2.5.2014 at 10:41 am

Appurtenant hereto is a right of way created by Easement Instrument 9686142.7 - 2.5.2014 at 10:41 am

Land Covenant in Easement Instrument 9686142.8 - 2.5.2014 at 10:41 am

Land Covenant in Easement Instrument 9686142.10 - 2.5.2014 at 10:41 am

Title Diagram Gazette Doc

Cpy - 01/01, Pgs - 001, 07/08/13, 16:24



DocID: 213463418

Extract from New Zealand Gazette, 18/7/2013, No. 91, p. 2477

**Land Declared Road, Land Set Apart for the
Functioning Indirectly of a Road (Segregation Strip)
and Land Set Apart for a Disposal Facility—
Reynolds Bach Drive, Manor Park, Hutt City**

Pursuant to the Public Works Act 1981, and to a delegation from the Minister for Land Information, Erin Stephen, Land Information New Zealand:

(a) Pursuant to section 114, declares the land described in the First Schedule to this notice to be road;

(b) Pursuant to section 52(4), declares the land described in the Second Schedule to this notice to be set apart for the functioning indirectly of a road (segregation strip);

(c) Pursuant to section 52(4), declares the land described in the Third Schedule to this notice to be set apart for a disposal facility and shall remain vested in the Hutt City Council on the date of publication hereof in the *New Zealand Gazette*.

Wellington Land District—Hutt City

First Schedule**Land Declared as Road**

Area ha	Description
0.9659	Part Section 742 Hutt District (part Computer Freehold Register WN25D/576); shown as Section 8 on SO 461420.
0.2068	Part Lot 1 DP 27329 (part Computer Freehold Register WNF2/115); shown as Section 9 on SO 461420.

Second Schedule**Land Set Apart for the Functioning Indirectly of a Road
(Segregation Strip)**

Area ha	Description
0.0039	Part Section 742 Hutt District (part Computer Freehold Register WN25D/576); shown as Section 10 on SO 461420.
0.0031	Part Section 742 Hutt District (part Computer Freehold Register WN25D/576); shown as Section 11 on SO 461420.
0.0018	Part Lot 1 DP 27329 (part Computer Freehold Register WNF2/115); shown as Section 12 on SO 461420.

Third Schedule**Land Set Apart for a Disposal Facility**

Area ha	Description
0.7008	Part Section 742 Hutt District (part Computer Freehold Register WN25D/576); shown as Section 6 on SO 461420.
94.2073	Part Lot 1 DP 27329 (part Computer Freehold Register WNF2/115); shown as Section 7 on SO 461420, subject to section 59 of the Land Act 1948, water supply rights in gross created by Transfer B253255.1 and electricity generation and transmission easement in gross created by Easement Instrument 9192765.2.

Dated at Wellington this 11th day of July 2013.

E. STEPHEN, for the Minister for Land Information.

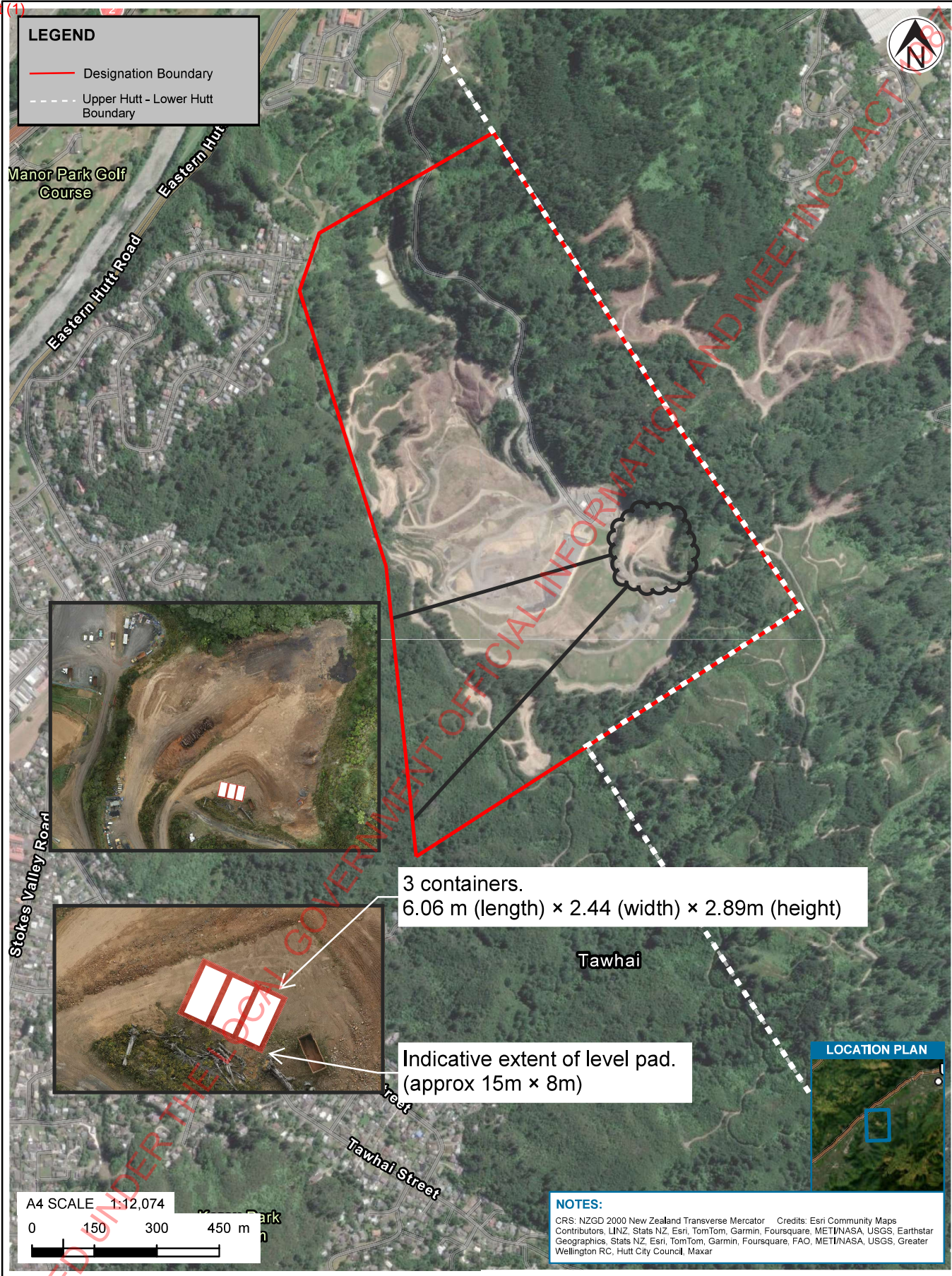
(LINZ CPC/2005/10894)

b4380

NOTICE NO: 4380

Appendix B Design Plans

RELEASED UNDER THE LOCAL GOVERNMENT OFFICIAL INFORMATION AND MEETINGS ACT 1987



 Tonkin+Taylor www.tonkintaylor.co.nz <i>Exceptional thinking together</i>	PROJECT No.			CLIENT Hutt City Council				
	DESIGNED	OLKE	SEP.24	PROJECT Silverstream Landfill				
	DRAWN	OLKE	SEP.24					
	CHECKED			TITLE Asbestos Destruction Trial				
APPROVED			DATE			SCALE (A4) 1:12,074	FIG No. FIGURE 1.	REV 0
Page 364								

RELEASED UNDER THE LOCAL GOVERNMENT OFFICIAL INFORMATION AND MEETINGS ACT 1987

www.tonkintaylor.co.nz

**Memo****To:** Alison Geddes, Director, Environment & Sustainability**CC:** Procurement, Jörn Scherzer, Aviva Stein**From:** Andred Saker, Senior Advisor, Resource Recovery**Date:** 14/6/2025**Security level:** In Confidence**Exemption to tender for EDL Pilot****Endorsed By:**

Jörn Scherzer	Head of Climate, Waste & Resource Recovery	s7(2)(a)	Date	<u>30/6/2025</u>
Fortune Tlapi	Head of Procurement	s7(2)(a)	Date	<u>15/06/2025</u>

Action:

Based on the reason(s) outlined in this memo, please approve this exemption to a competitive tender process for the EDL asbestos treatment pilot at the Silverstream Landfill.

I, Alison Geddes (appropriate DFA Holder) approve the recommended approach as outlined in this memo.

 Signature

 Date
Comments:

Purpose:

1. The purpose of this memo is to seek an exemption from going to an open market tender for the proposed EDL asbestos treatment pilot at the Silverstream Landfill.

Background

2. The class 1 Silverstream Landfill is owned by Hutt City Council and is one of a limited number of landfills in the North Island of New Zealand that accept asbestos and asbestos containing materials (ACMs) for disposal.
3. The disposal of asbestos and asbestos containing materials is problematic at Silverstream Landfill and other landfills due to the hazardous nature of the waste and the significant volumes/tonnages involved.
4. Environmental Decontamination Limited ("EDL") is a New Zealand owned and based R&D company that have been developing contaminant remedial technology for the past 20 years.
5. The technology has been validated in laboratories by world class institutions in the USA and Europe, but a practical demonstration (i.e. a pilot) is required before it can be scaled up to process industrial tonnages of asbestos and ACMs.
6. The proposed pilot will consist of installing two specially modified 40-foot containers that will house the plant & equipment required for the pilot in the borrow area of the Silverstream Landfill.
7. The proposed pilot was jointly funded by EDL and the UK Government's Nuclear Decommissioning Authority and according to figures released by EDL and has cost approximately \$5 million to date.
8. The Nuclear Decommissioning Authority withdrew funding as part of a suite of cost-cutting measures by the UK Government in early 2025 resulting in the pilot being suspended.
9. The Council is proposing to fund the shortfall to enable the proposed pilot to continue and realise the significant benefits to Council and Lower Hutt city that a pilot and subsequent industrial plant could bring.

Reasons for a Direct Source Approach

10. The EDL technology involves a complex mechanochemical process to neutralise the harmful molecular structure of asbestos fibres and results in the production of an inert, amorphous powder that has significant reuse potential as a filler in the cement industry.
11. The advantages of using a mechanochemical process to destroy asbestos fibres instead of other processes is that it does not require expensive industrial applications of heat, pressure and/or chemical catalysts to achieve the same outcome.
12. The technology was first trialled by EDL in Johannesburg in 2015 and has since then evolved to the point where a successful pilot at the Silverstream Landfill will act as the precursor for an industrial size plant.

13. The value of the technology comes not only from the suite of global patents but more importantly from the cutting-edge nature of the plant and the knowledge/experience required to treat asbestos and ACMs using the mechanochemical process.
14. This value means that EDL are world leaders in the mechanochemical destruction of asbestos and ACMs and therefore the only company globally that can offer this technology at a pre-industrial level at present.
15. The proposed pilot will only treat relatively minor tonnages of asbestos and ACMs, but an industrial plant located in Lower Hutt city has the potential to significantly reduce the amount of local, regional and potentially national asbestos and ACMs being disposed of at landfill.

Financial Commitment:

16. The Council is proposing to fund the \$365,000.00 shortfall left by the UK Government by using funds from the waste levy in accordance with the our current [Waste Management and Minimisation Plan](#)
<https://www.huttcity.govt.nz/services/rubbish-and-recycling/waste-management-and-minimisation-plan-wmmp>
17. If approved, the Council will enter a contract to undertake a 6–12-month pilot of their asbestos treatment technology at the Silverstream Landfill and will include provisions that directly and indirectly benefit Council and Lower Hutt city.

Recommendation

18. It is recommended that, for the reasons outlined in this memo you approve the direct sourcing of this contract to EDL for the purposes of undertaking a pilot of their asbestos treatment technology at the Silverstream Landfill.



Climate Change and Sustainability Committee

09 June 2025

Report no: CCASC2025/3/191

Update on Waste and Resource Recovery Matters

Purpose of Report

1. This report consolidates information on the status of Council's solid waste management and minimisation initiatives.
2. Detailed and regular information on the ongoing development, operation and performance of the Silverstream Landfill is covered in a separate report to the Hutt Valley Services Committee. The latest report from May 2025 is [available online \(page 41\)](#).

Recommendation

That the Committee receives and notes the update on various waste management and resource recovery matters.

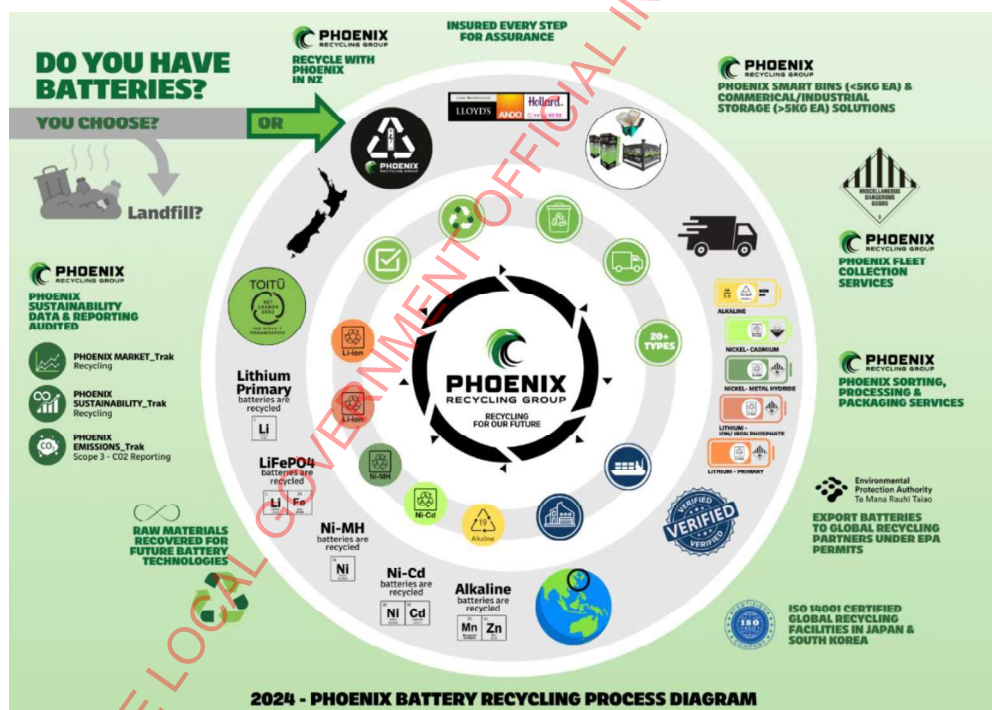
Implementation of Wellington Region Waste Management and Minimisation Plan 2023-2029 (WMMP)

3. To provide the Committee with a regular progress update on the projects underway or planned to implement the WMMP, including Hutt City Council's local actions, an updated project dashboard is shown in Appendix 1.

Battery recycling supply chain assurance

4. Following the announcement of the battery recycling service due to roll out across Council's community hubs, Council requested assurance regarding the end destination of collected batteries. Officers have confirmed the recycling supply chain and associated compliance measures as outlined below.

5. All batteries collected through this service will be transported to Phoenix Recycling Group's dedicated battery export yards in Auckland and Christchurch. At these facilities, batteries are sorted, segregated by chemistry, and packaged in accordance with relevant regulations in preparation for export under an Environmental Protection Authority approved Hazardous Waste Licence.
6. New Zealand is party to several multilateral environmental agreements, including the Basel Convention, which regulates the international movement of hazardous waste. The Convention requires prior consent for all imports and exports of hazardous waste and obligates exporting countries to ensure the waste is managed in an environmentally sound manner. Currently, the batteries are sent to [ISO 14001](#) certified recycling facilities in Japan and South Korea.
7. Phoenix Metal Recyclers NZ Limited is Toitū Carbon Zero certified and will provide Council with annual battery recycling certificates, confirming the total volume of batteries recycled each calendar year.
8. The diagram below provides an overview of the Phoenix battery recycling process.



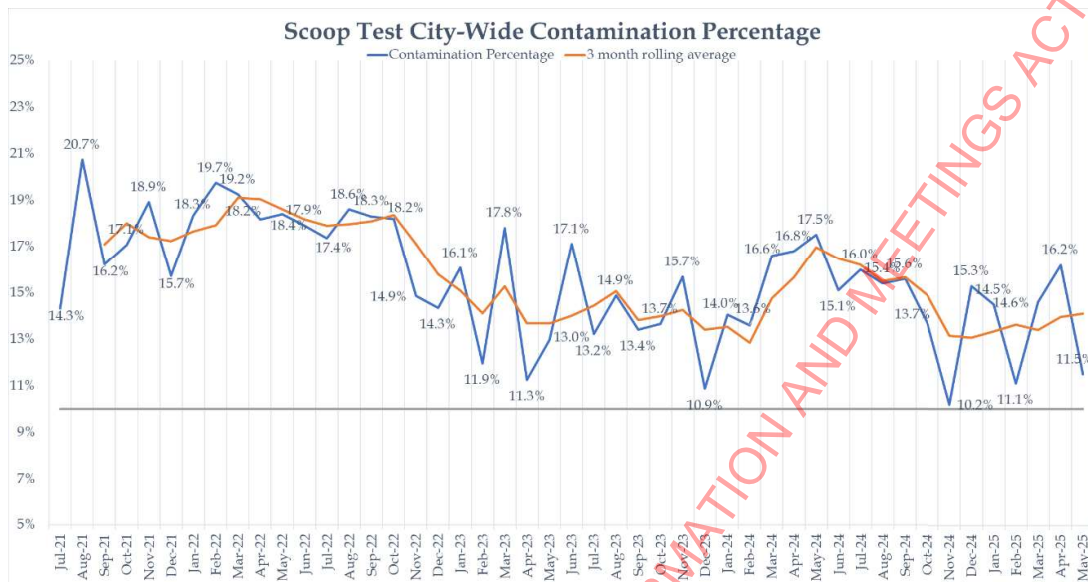
Strengthening the Wellington Region Waste Forum R3 project

9. The Waste Forum, Wellington Region Incorporated Society (Forum) is a long-standing independent non-profit organisation. The Forum has served as a key platform for collaboration and discussion on waste management and environmental issues for the past 45 years. The forum facilitates networking and information sharing among commercial operators, council officers, elected representatives, government agencies, and other organisations active in the sector. Its objectives include:

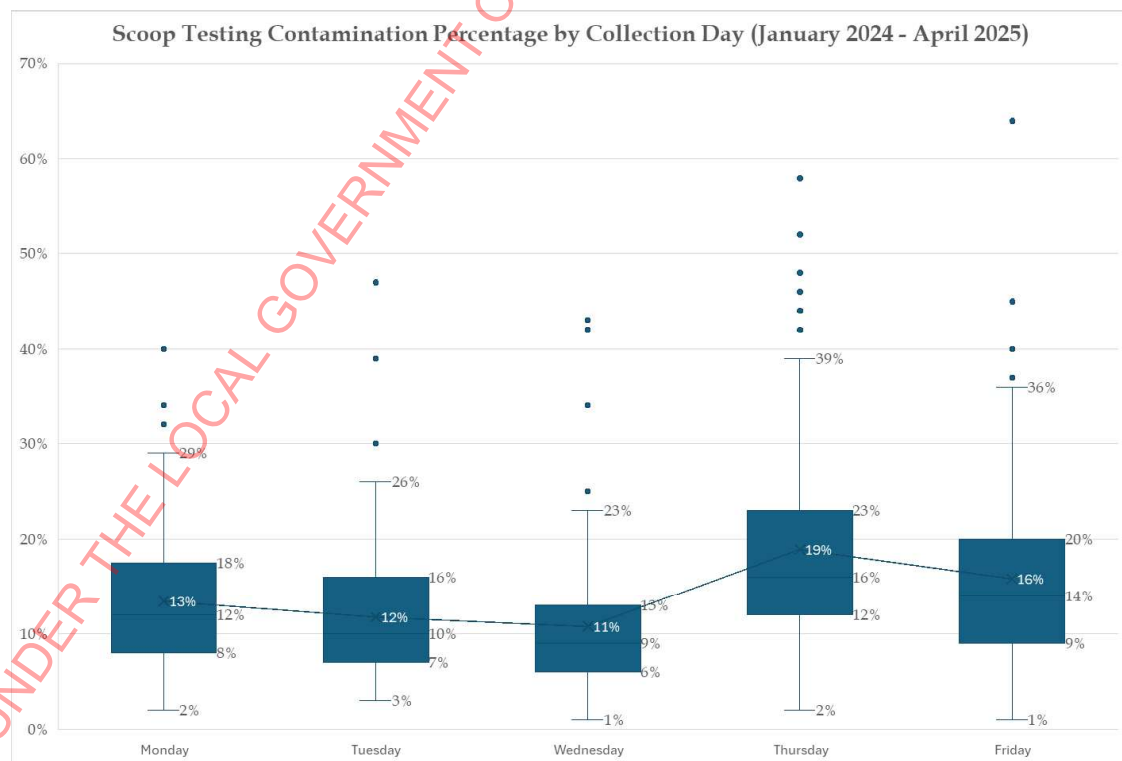
- a. Generating awareness of waste minimisation, resource efficiency, and resource recovery.
 - b. Facilitating the exchange of feedback and information to member organisations.
 - c. Promoting regional environmental campaigns and encouraging environmentally sound policies and practices among local authorities.
 - d. Liaising with other agencies, including central government, on environmental issues.
 - e. Staying informed about environmental issues through its network.
10. Hutt City Council has played a key role in supporting the Forum's operations, with a Hutt City councillor serving as Chair and council staff fulfilling the Secretary and Treasurer roles since approximately 1980.
 11. Participation and engagement in the Forum have declined over time, particularly among industry and NGOs. This was recognised in the WMMP as an area to improve on and in response a regional project (Strengthening the Wellington Waste Forum R3) has been underway to strengthen the Forum. This includes a focus on re-establishing existing relationships and building new ones by enhancing the Forum's value, importance, and relevance to its original target audiences.
 12. As part of this effort Hutt City Council will be hosting the fourth Forum delivered under the rejuvenation project this month, on 25 July 2025 at the Dowse Art Museum, themed "*Lifting the Lid on Waste – Turning Insights into Action*". This will include presentations from event waste, construction and demolition waste, waste education and landfill management experts among others.

Contamination

13. The contamination rate for April was 16.2%, and for May was 11.5%. However, the three-monthly and six-monthly rolling averages are at 14.1% and 13.9% respectively.
14. The scoop tests that make up the April monthly average had three more contaminated scoops with 52%, 37% and 39% contamination by weight that increased the monthly average significantly. Excluding these outliers, the monthly average across the scoop tests was 12%.



15. For further context, the graph below shows analysis of the scoop testing data from January 2024 across the collection days. This shows that the Wednesday collection day has the lowest contamination rate on average (and less spread of contamination rates across tests). Thursday is the highest and has more of a spread of contamination rates across tests.



16. For each collection day, the suburbs collected from are:
- Monday - Waiwhetū, Eastbourne, Moera, Fairfield, Waterloo
 - Tuesday - Petone, Alicetown, Hutt Central, Woburn
 - Wednesday - Normandale, Maungaraki, Korokoro, Epuni, Belmont, Boulcott, Avalon, Tirohanga, Haywards
 - Thursday - Stokes Valley, Taitā, Naenae
 - Friday - Kelson, Wainuiomata
17. Targeted work has been undertaken for the suburbs that are showing higher contamination in scoop testing and sticker data. This includes:
- Distributing a multilingual booklet in Taitā and Wainuiomata (also available [online](#)),
 - Hazardous material reminder letters sent to Pōmare and Stokes Valley (in response to scoop testing data showing incidences of hazardous materials from collections in these areas), and
 - Leaflets delivered to Fairfield, Waterloo, and Naenae.
18. Officers have also begun work to engage the new behaviour change agency on contamination reduction. One focus will be on designing targeted local communication initiatives and preparing FAQ response resources for easy access for residents (and to support staff training) in community spaces such as libraries and hubs.

Climate Change Impact and Considerations

19. The matters addressed in this report have been considered in accordance with the process set out in Council's Climate Change Considerations Guide.
20. Minimising waste, diverting recyclables from landfill, and recovering reusable materials (such as the potential addition of C&D diversion opportunities, diverting biosolids, etc.) contribute to a more circular economy. These activities reduce the need to extract further resources from the environment and the associated energy use.

Consultation

21. Not applicable.

Legal Considerations

22. Not applicable.

Financial Considerations

23. There are no current financial considerations at this time.

Appendices

No.	Title	Page
1	Appendix 1 - WMMP Local Action Plan Programme Dashboard	28

Author: Jessica Hayman
Senior Advisor Waste - Planning and Strategy

Reviewed By: Jörn Scherzer
Head of Climate and Waste

Approved By: Alison Geddes
Director Environment and Sustainability

Appendix 1. Summary of WMMP Local Action Plan Programme Dashboard

There are currently 29 projects, the majority of which are planned or already underway to meet the actions outlined in the WMMP (2023-2029), outlined in the programme summary below.

Name	LAP Action*	Regional/Local	Stage	Project Description	Project type	Subject matter	Project impact**	Project update
City wide behaviour change	Action 7	Local Project	Completed	Procuring a provider to deliver campaign(s) to support waste minimisation.	Comms/engagement	Behaviour change	High Weight	The procurement process for a new agency was completed (EightyOne). Work is now underway for two upcoming campaigns - Litter & Illegal dumping and Recycling contamination.
Kerbside - Contamination reduction	Action 19	Local Project	In progress	Investigate and implement a range of actions to address and reduce kerbside contamination.	Comms/engagement	Kerbside	High Weight	Contamination reduction work continues. This includes work with the new behaviour change agency EightyOne (contract signed in Q4) to support targeted engagement and refreshed use of existing assets and graphics.
EV Charging Hub and Landfill electrification	Action 20	Local Project	Completed	Install EV Charging Hub for heavy vehicles and machinery at the Silverstream Landfill.	Operational	Silverstream	High Weight	Civil construction work was completed in March 2025. The installation of charging equipment was completed in June 2025, and EV chargers are now operational. We are now working with WMNZ to firm up their plans for electrified equipment to be utilised in landfill operations.
Bylaw Implementation (C&D waste)	Action 9	Local Project	In progress	Implementation of the bylaw requirement to have waste management and minimisation plans for new developments over \$2M in value.	Operational	Compliance	High Weight	C&D bylaw implementation is progressing, with regional scoping ongoing and initial work underway with internal consents teams to identify implementation triggers, and to design associated processes.
FOGO kerbside collection and processing	Action 12	Sub-regional Project	In progress	Plan and implement a potential new kerbside FOGO service, and identify a suitable processing solution.	Operational	Organics	High Weight	A detailed project update was provided to the LTP subcommittee on 24 February 2025. Officers are scheduled to provide an updated report to Council in early 2026. Note that the final stage of the procurement has been put on hold by WCC until August 2025, due to a report back and associated decisions by WCC regarding the potential of a local processing solution at Southern Landfill.
Future of residual waste	Action 11	Regional Project	In progress	Undertake an investigation to assess the regional flow of waste and the current and future infrastructure and services required to manage known and future residual waste streams (including disposal or alternatives), HCC leads this regional project.	Policy	Research	High Weight	Data collation is underway. There have been discussions with other councils in the region on available data and opportunities for updated SWAPs to be commissioned, which would support more accurate modelling.
Minimising Event Waste	Action 2	Local Project	In progress	Establish and embed a process with internal and external stakeholders to minimise waste and litter at community events over 1000 attendees.	Operational	Events	Medium Weight	A trial is still under way with Non-Stop Solutions to partner with event organisers to ensure best practice waste management and minimisation for community events. The trial is coming to a close, and the team is working on options for continuing to support large events, as well as options for expanding support to minimise waste at smaller events.
C&D commercial solution	Action 13	Sub-regional Project	On hold	Investigate and implement diversion pathways for commercial C&D waste.	Operational	C&D	Medium Weight	HCC is working with stakeholders to prepare Silverstream Landfill for a trial diversion pathway to a recovery facility in the Manawatu. This is an interim solution while the Portua processing facility progresses under the subregional project. The project is on hold due to delivery capacity at Silverstream.
Soil and aggregate recycling	Action 12	Local Project	In progress	Collaborate with partners to potentially develop a soil and aggregate recycling facility at Silverstream Landfill.	Operational	Contaminated Soil	Medium Weight	HCC has updated data to Fulton Hogan, to inform the development of their commercial model and business case. We are waiting on Fulton Hogan to advise on next steps, albeit we understand there are some concerns to progress the project in the current uncertain economic climate.
Waste Forum	Action 6	Regional Project	In progress	Provide Secretary and Treasurer support for the Forum, and maximise the effectiveness of the Waste Forum.	Comms/engagement	Events	Medium Weight	Planning is underway for hosting the Waste Forum in Lower Hutt on 25 July 2025. Work is also under way to identify opportunities for further improving the effectiveness and reach of the Forum.
Silverstream resource recovery improvements	Action 4	Local Project	In progress	Identify and implement transfer station and Zero Waste Hub improvements to increase diversion of recoverable materials.	Operational	Resource recovery	Medium Weight	As an addition to the materials already diverted through the discount voucher scheme (operated by Earthlink Inc), officers are progressing with adding other waste streams such as native timber, plate glass as well as establishing a drop off as part of the 15yewise scheme.
Business engagement	Action 4	Regionally Coordinated Local Project	Not started	Develop a business engagement plan consistent with agreed regional approach.	Comms/engagement	Business	Medium Weight	Not yet started.
Business waste audits	Action 4	Local Project	Not started	Offer and deliver audits to engaged businesses as part of business engagement plan	Comms/engagement	Business	Medium Weight	Not yet started.
Treated timber diversion research	Action 11	Local Project	On hold	Research diversion opportunities for treated (and untreated) timber.	Operational	Research	Medium Weight	Trial is on hold while discussions around regional and industry co-funding options are explored.
EDL soil remediation trial	Action 12	Sub-regional Project	On hold	The company EDL has proposed a trial of a technology to neutralise recalcitrant soils (eg contaminated with asbestos).	Operational	Contaminated Soil	Medium Weight	In Q4, EDL advised that some of the funding to enable the trial was withdrawn by the UK Government. This has resulted in a funding shortfall, and HCC and EDL are exploring alternative funding options to continue the pilot trial of their technology at the Silverstream Landfill.
Bylaw review	Action 9	Regionally Coordinated	Planning	Undertake a review of Council's Solid Waste Management and Minimisation Bylaw 2023-2029 in line with statutory requirements (regionally coordinated).	Policy	Various	Medium Weight	Not yet started.
Contaminated soil	Action 12	Regional Project	Planning	Lead on regional project to investigate the quantum, source, degree of contamination, and fate of contaminated soil from around the region and identify opportunities to support diversion from landfill disposal.	Policy	Contaminated Soil	Medium Weight	HCC team presented to the Regional Steering Group on a recommended revised scope for the project and the likely need for external support on data analysis.
Site remediation	Action 21	Local Project	In progress	Identify and implement remediation options for closed landfills.	Operational	Research	Low Weight	The Gollan's Valley farm has been purchased by GWRC. The closed Eastbourne Landfill is located on the farm property, and this could simplify any future remediation works at the landfill. HCC is in discussions with GWRC on remediation options.
Regional project contributions		Regionally Coordinated	Ongoing	Providing input and subject matter expertise on various Regional WMMP projects that are led by other Councils or centrally by the WMMP Programme Manager and Regional Advisor.	Policy	Various	Low Weight	Underway through the Regional Data Framework. Regional Website development. Waste in Emergencies and other active projects.

* Projects related to Actions 1 and 17 are delivered through contracts delivered by external providers and are treated as business as usual (EnviroSchools contract, Sustainable Coastlines contract).

**Project weight is calculated from a weighted formula that includes 'priority', 'diversion potential', 'reach', and 'budget'.

Appendix 1. Summary of WMMP Local Action Plan Programme Dashboard

There are currently 29 projects, the majority of which are planned or already underway to meet the actions outlined in the WMMP (2023-2029), outlined in the programme summary below.

Biosolids trial at Silverstream	Action 15	Local Project	Completed	Trial the reuse of biosolids in borrow areas of Silverstream Landfill.	Operational	Silverstream	Low Weight	The trial at the landfill involving planting into soil mixed with dried biosolids proved successful, with the highest application of biosolids correlating with the greatest plant growth. As a result, Council is in the process of applying for consent to apply dried biosolids to the borrow areas prior to planting.
Litter reduction campaign	Action 18	Local Project	Not started	Implement city-wide campaign on litter and illegal dumping.	Comms/engagement	Litter	Low Weight	Scoping work is underway. Research, development and creative design is likely to take at least three months.
Additional zero waste hub	Action 12	Local Project	On hold	Investigate options for a potential additional Zero Waste Hub facility, including working with existing resource recovery partners to expand operations.	Operational	C&D	Low Weight	Scoping on this project is on hold due to team capacity.
Organisational behaviour change	Action 2	Local Project	In progress	Implement waste minimisation initiatives internally (at Lang's Road administrative building) and across council facilities.	Internal	Behaviour change	Low Weight	Results from a waste audit at Laings Road admin building are being analysed to inform a targeted campaign and a system-level solution.
Stormwater treatment trial	Action 18	Local Project	In progress	Trial a Downstream Defender unit to capture gross pollutants, litter and fine contaminants in stormwater to provide baseline data for waste and pollutants entering waterways, and for a proof of concept to improve stormwater quality.	Operational	Litter	Low Weight	HCC is investigating options to reduce the estimated costs of installing the device. Unless costs be reduced, the trial won't be affordable. Procurement planning is underway to identify preferred suppliers and to determine if the project can be undertaken within existing funding parameters.
Embedding waste reduction in procurements	Action 3	Local Project	Not started	Create and implement a policy for reducing waste in contracts and services procured across HCC.	Internal	Waste minimisation	Low Weight	Not yet started.
CBD single-use transition engagement	Action 4	Local Project	On hold	Work to transition Lower Hutt CBD to a single-use free city, with a primary focus on eliminating disposable coffee cups and supporting reuse.	Comms/engagement	Waste minimisation	Low Weight	Early engagement with businesses is underway to inform the development of a potential campaign and/or implementation options.
Decarbonise landfill contracts	Action 3	Local Project	Complete	Ensuring newly awarded waste contracts reduce emissions within contract activity and to report on contract emissions annually with alignment with HCC decarbonisation targets.	Internal	Waste minimisation	Low Weight	All significant waste-related procurements have included specific emission reduction requirements and/or criteria. The landfill capex works contract, the landfill design and monitoring contract, and the closed landfill maintenance contracts, have been finalised and signed. Management of those contracts now moves into BAU, albeit we will continue to work to identify improvement opportunities regarding carbon reductions where possible. This stage, significant waste contracts are not coming up again for renewal until 2028.
Central government advocacy	Action 10	Local Project	In progress	Central government advocacy opportunities are approached from a regional perspective or local perspective, if and when appropriate.	Comms/engagement	Various	Low Weight	A submission was made on the Ministry for the Environment's proposed changes to the Waste Minimisation Act 2008 and Litter Act 1979. Preparation for this submission included information sharing with regional officers on the likely areas of focus for each Council.
Battery Recycling	Action 2	Local Project	In progress	Investigate options, and if viable implement, accessible battery collection for recycling for Lower Hutt residents.	Resource Recovery	Resource recovery	Low Weight	A preferred supplier has been selected, and implementation is planned for July in the first three hubs.

* Projects related to Actions 1 and 17 are delivered through contracts delivered by external providers and are treated as business as usual (EnviroSchools contract, Sustainable Coastlines contract).

**Project weight is calculated from a weighted formula that includes 'priority', 'diversion potential', 'reach', and 'budget'.

MEMORANDUM

29

02 July 2025

Our Reference

TO: Chair and Members
Climate Change and Sustainability Committee

FROM: Jessica Hayman, Senior Advisor Waste – Planning and Strategy

DATE: 09 June 2025

SUBJECT: RETROSPECTIVE APPROVAL MEMORANDUM FOR
SUBMISSION TO CONSULTATION ON PROPOSED
CHANGES TO WASTE LEGISLATION

Purpose of Memorandum

1. The purpose of this memorandum is to present the Committee with a submission to the Ministry for the Environment (MfE) on the proposed changes to the Waste Minimisation Act 2008 and Litter Act 1979, and to seek the Committee's retrospective approval for this submission.

Recommendation

That the Committee:

- (1) notes and receives the memorandum; and
- (2) retrospectively approves the submission to the consultation on the proposed changes to the Waste Minimisation Act 2008 (WMA) and Litter Act 1979 attached as **Appendix 1** to the memorandum.

Background

2. The proposed changes to the WMA and Litter Act include:
 - a. creating a framework for extended producer responsibility;
 - b. changes to the levy system including waste levy allocation, distribution and options for use by local government;
 - c. amending roles and responsibilities in the waste legislation;
 - d. creating a more modern compliance regime;
 - e. enabling greater controls for littering and other types of mismanaged waste.
3. Many of the changes proposed would modernise the legislation and make it more fit for purpose. However, the submission goes into detail on several areas of concern and/or ambiguity and recommends further consideration or change. This includes, for example, the proposed expansion of options for local government spending of waste levy funds to non-waste related activities.

MEMORANDUM

30

02 July 2025

4. Submissions on the consultation closed on Sunday 1 June 2025, approximately one month before the Climate Change and Sustainability Committee's meeting. To ensure Council can have its say, the submission was submitted to MfE on Thursday 29 May and retrospective approval is being requested.
5. The submission was reviewed by Acting Mayor Simon Edwards, Chair Josh Briggs and Deputy Chair Chris Parkin (Climate Change and Sustainability Committee) and Councillor Andy Mitchell (Deputy Chair of the Wellington Region Joint Waste Management and Minimisation Committee) before being submitted with feedback incorporated.
6. The submission is attached as **Appendix 1** to the memorandum.

Appendices

No.	Title	Page
1↓	Appendix 1 - HCC Submission on Proposed Changes to Waste Legislation	31

Author: Jessica Hayman
Senior Advisor Waste - Planning and Strategy

Reviewed By: Jörn Scherzer
Head of Climate, Waste and Resource Recovery

Approved By: Alison Geddes
Director Environment and Sustainability



By email/online consultation

29 May 2025

Email to: wasteamendment@mfe.govt.nz

Tēnā koutou katoa,

Proposed amendments to the Waste Minimisation Act 2008 and the Litter Act 1979

1. Hutt City Council welcomes the opportunity to provide feedback on the proposals to amend the Waste Minimisation Act 2008 (WMA) and Litter Act 1979 (Litter Act).

Background

2. Hutt City Council's role in waste management and resource recovery includes the operation of kerbside waste, recycling and green waste collection, operating Silverstream Landfill, monitoring and managing closed landfills, and investigating, trialling, and implementing a range of initiatives to increase resource recovery.
3. The Councils across Wellington Region have committed to a 2023–2029 Waste Management and Minimisation Plan (WMMP) that recognises the need to transition to a more circular economy.
4. As landfill capacity decreases, it is crucial to maximise resource recovery to keep valuable materials in circulation, benefit community health and protect the environment and climate. Local government currently carries much of the burden of waste management including disposal and resource recovery with few levers to influence the nature and magnitude of waste being produced in the first instance.

Overview

5. Fit-for-purpose waste legislation is needed to enable local government to play its role and Hutt City Council welcomes many of the proposed changes

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▲ The pattern at the top of this page is inspired by the natural landforms, hills, river, and coastline surrounding Lower Hutt. It represents our people, our place, and our home.

set out in the Consultation Document. For example, Hutt City Council is particularly supportive of the proposed changes to:

- a. Establishing an extended producer responsibility framework that shifts end-of-life product recovery costs and responsibilities from councils to producers, importers, and relevant users.
 - b. Removing central government accreditation of voluntary product stewardship schemes. The voluntary accreditation process is resource intensive, and this resourcing would be better refocused on mandatory and enforceable schemes that reduce the burden of waste on councils and households.
6. There are several areas of concern in the Consultation Document that Hutt City Council would like to provide more specific feedback on. This feedback is set out in full in this submission, and summarised below:
- a. **Oppose** expansion of local government levy scope without significant changes and clarification; and
 - i. **Recommend** limitations to proposed options and proportion of levy spend available to non-waste minimisation activities.
 - b. **Seek consideration** of differentiation between types of waste to energy facilities in relation to proposed removal of blanket levy exclusion; and
 - i. **Set out** examples of waste-to-energy with differing inputs and outcomes for consideration.
 - c. **Oppose** proposed change to the role of the Minister for the Environment to enable Minister to direct territorial authorities to do a particular activity through the WMMPs, in the absence of clearer justification for this proposal and/or full funding by central government so as to avoid circumvention of local decision-making with regards to rate increases.
 - d. **Support** proposed changes to compliance and enforcement; and
 - i. **Seek clarification and engagement** on system design as it relates to bylaw enforcement.
 - e. **Largely support** compliance changes as they relate to mismanaged waste (including cost recovery and compensation).

- i. **Recommend** retention of low-level fines and an increase to the maximum infringement fine.

Waste disposal levy

Consultation questions 4 and 5 – expansion of local government levy scope

7. Hutt City Council does not support the proposed scope of options that would be eligible for levy funding without significant changes and clarification.
8. The burden of planning for and operating waste collection and management services in a take-make-and dispose economy currently falls on councils and ultimately residents across the country. Broad expansion of the options for levy spending to activities with little or no connection to reducing this burden is likely to undermine the levy function. This is of particular concern in a time of rising costs and constrained budgets, when some councils will easily be tempted to divert levies to purposes other than waste management and minimisation. The government should be mindful of unintended consequences such as redirection of funding away from diverting organic waste from landfills, which is critical for meeting council and government emission reduction targets.

Purpose of the levy

9. The purpose of a levy is to raise funds from a group or activity and earmark this funding for costs that relate to that activity or a relevant function, as opposed to a general tax for wider use.¹ This is the basis for raising the waste levy on disposal and ring fencing it for waste minimisation actions. Over time, levy funding may reduce as diversion increases and disposal decreases.
10. The proposed expansion of levy spending options for local government would be in addition to an already expanded scope for central government levy spending. This includes options to spend levy funds on some projects that are not required to relate directly to waste (including for example,

¹ LDAC, Legislation Guidelines 2021 Edition, paragraph 17.2.

activities that reduce environmental harm or increase environmental benefits).

Inconsistent planning and reporting requirements

11. Reducing the burden of waste on disposal facilities, households and the environment requires long term planning and sustained actions. It is unclear whether the expanded options for levy funding would be subject to the same planning and consultation requirements currently undertaken for the development of a WMMP. This planning, and the current levy reporting requirements provide important certainty, transparency and accountability to communities.

Need to ringfence funding for waste minimisation spending, and limit broader spending from levy funds

12. Existing landfill capacity across the Wellington Region is under significant pressure and effective waste minimisation is urgent and fundamental to community and environmental health. This is particularly important where it reduces the need for further landfill locations or alternative disposal.
13. Any expansion of the scope of options for levy spending that does occur beyond waste minimisation should be limited by legislation to a minor proportion of the local government levy spend, with requirements to ringfence funding for waste minimisation actions to support effective diversion.

Specific feedback on proposed options for permitted levy expenditure

14. Option a) *Activities that promote or achieve waste minimisation, in accordance with and as set out in the territorial authorities' Waste Management and Minimisation Plan*
 - a. The current WMMP for Wellington extends out to 2029 and is supported by clear strategy and long-term planning. Many of the actions and targets require funding certainty to support crucial progress. Care needs to be taken to ensure that this status quo approach is not undermined if funding is diverted to other projects and activities outside of the scope of waste minimisation.

- b. Sufficient and certain funding for staffing resource for many Councils is also required as a minimum to support WMMP actions, as supported in the Consultation Document through the 80:20 levy distribution proposal.
- c. Some expansion of scope or additional clarity would be useful for activities such as education programmes that cover waste and other environmental issues to support better consumption patterns and lower waste impacts. Projects such as these that have a large waste minimisation component, but also other behaviour change, and sustainable resource use objectives would usefully be captured squarely under a WMMP with clear levy eligibility as a waste minimisation project overall.

15. Option b) *Costs associated with managing emergency waste*

- a. Any provision for emergency waste from the levy funding would need to be planned for and set aside as a contingency to ensure that it does not undermine planned expenditure for committed actions for waste minimisation.
- b. This expansion also overlaps significantly with the existing provision for central government to spend their levy portion on "funding local authorities to manage emergency waste and to repair or replace waste management and minimisation infrastructure damaged by an emergency". Further clarity is needed on the interface of this funding and how it will be triggered by an emergency declaration and accessible to local authorities.
- c. Consideration could also be given to focusing the option for local government spending on waste minimisation in this area in emergencies (for example recovery of construction and demolition waste). This could work alongside the central government levy portion contribution to managing waste and infrastructure repair.

16. Option c) *Activities that provide for the remediation of contaminated sites and vulnerable landfills*

- a. This should only apply for legacy sites that at least pre-date the introduction of the levy in 2009. All recent and current disposal

activities or contaminating activities should have reserves for remediation costs already and should not be eligible for levy spending to clean up or remediate those sites.

- b. Levy funding should not be available for monitoring and general maintenance of closed landfills that is likely already required and undertaken under consenting requirements. However, step change improvements and remediation would be more appropriate for funding eligibility, including for example gas destruction and capture at closed landfills.

17. Option d) *Compliance, monitoring and enforcement of mismanaged waste*

- a. Enabling levy spending on compliance, monitoring and enforcement of mismanaged waste is consistent with the changes proposed to bring the Litter Act responsibilities into the same piece of legislation.
- b. However, as discussed above, clear requirements must be set to ensure the proportion of levy spend on this is limited to ensure that waste minimisation remains the priority for levy spending.

18. Option e) *Activities that reduce environmental harm or increase environmental benefits*

- a. It is not appropriate to expand the levy spend options this broadly unless strong limitations are in place to ensure planning and spend reporting is accountable and transparent and clearly linked to reducing resource use and the resulting waste or emissions.
- b. Relying on a decision-making framework as proposed is likely to be too high level and out of step with the clearer WMMP requirements that apply to waste actions funded from the same levy.

Consultation question 6 – Waste-to-energy exclusion

19. The removal of a blanket exclusion for applying the levy to waste to energy facilities should be subject to consideration on the appropriate differentiation (via regulations) between the different waste to energy facilities. This is to ensure that this change does not lead to unintended policy outcomes, such as reducing the incentive to utilise the technologies to divert waste or recover resources. For example:

- a. Facilities such as anaerobic digestors for food or green organics that have a more renewable feedstock as well as output materials with beneficial use should not be subject to the levy. Ideally, the destruction of valuable nutrients should be avoided altogether in a circular approach to resource recovery.
- b. Single streams of waste materials that can displace fossil fuels such as coal should also be considered for levy exemptions or reductions where there is no other beneficial use of that material currently. For example, treated timber co-incineration at Golden Bay Cement.
- c. Any facilities receiving unsorted or municipal solid waste feedstock that would accept and treat the same waste as landfills could be subject to the levy as the facility would receive similar waste, destroy waste without producing recoverable materials, have potentially significant externalised environmental and health impacts that are not yet tested in the New Zealand regulatory context and may displace renewable energy sources.

Clarifying the roles and responsibilities in the waste legislation

Consultation question 17

20. Hutt City Council does not support the proposal to enable the Minister to direct territorial authorities to do a particular activity through the WMMPs (in addition to current powers to amend, add or omit provisions where a WMMP is inadequate).
21. The justification for such a change is not clearly set out in the Consultation Document. Policy direction including mandates are already set by Central Government, as are waste strategies to which Councils must have regard to when developing WMMPs. These levers could be strengthened, if necessary, without going as far as directing specific activities in a WMMP.
22. WMMP activities are funded from the local government portion of the levy and developed in consultation with local communities. Care needs to be taken not to undermine this process of accountability and support building from key stakeholders. Councils and their ratepayers already struggle under the burden of frequent unfunded mandates which add to or can supersede

the careful consideration of rates funding decisions by locally-elected representatives.

Compliance and data regime, and cost recovery for waste removal

Consultation question 21

23. Hutt City Council supports improvements to compliance tools and sanctions. Additional clarity would be useful on how the proposed tier system and other tools may better support effective council bylaw enforcement. Waste bylaws can span many activities including multi-unit development (MUD) waste provision requirements and kerbside rubbish and recycling compliance.

24. The nature of enforcement and compliance challenges in these bylaws can differ greatly depending on the regulation activity. For example, the impact of an infringement fee or caution for an individual that has created litter issues may differ greatly to a MUD developer that fails to comply with an approved waste plan.

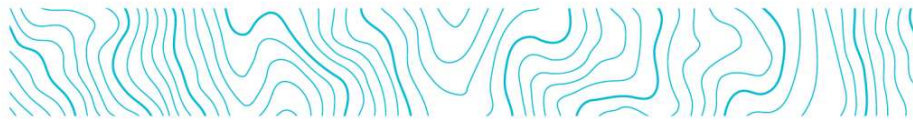
25. Hutt City Council looks forward to seeing further detail on the amended framework once established and would like to see engagement with councils where appropriate as the specifics of these matters are developed.

Consultation questions 32 and 35

26. Hutt City Council supports the proposal that infringement fees (monies recovered) remain with the issuing authority as it is now under the Litter Act 1979.

27. There is some concern about the proposed compliance framework. Currently an infringement fine of \$100 is appropriate for illegal bag use, or small-scale littering, however the proposal speaks about "*low level disciplinary action, such as formal warnings for infringements*". It is preferred that current provisions not be diluted, and that an infringement fine is still appropriate for small scale offending. Hutt City Council also supports the proposed tiered infringement system responding through the fine levels to repeat offenders that offend multiple times within a defined period.

28. There is currently a limit on the maximum infringement fine that authorities can issue, being \$400. In some instances of illegal littering, the amount of litter deposited is very large, e.g. small truck load. The cost of collecting and disposing the litter is often well above the maximum fine. It is submitted that the maximum infringement fine be increased to at least \$1000, for litter dumping of say more than 4 large bags.
29. An alternative could be the ability for authorities to cost recover for their costs, without the need for a formal court prosecution, and court order. Cost recovery should still be in addition to the maximum fine. The Consultation Document includes reference to proposals to enable sufficient cost-recovery provisions for CME and clean-up and potential compensation, if the littering and/or dumped waste causes environmental harm. These changes would support deterrence, and we look forward to seeing more detail in the legislation on how these tools would work



Addendum

Date:	14 July 2025
Director:	Alison Geddes Director, Environment & Sustainability
Author:	Andred Saker Senior Advisor, Resource Recovery
Authorised by:	Joern Scherzer Head of Waste, Climate & Resource Recovery
Subject:	FURTHER INFORMATION RE: EDL ASBESTOS DESTRUCTION PILOT AT THE SILVERSTREAM LANDFILL

Purpose

This paper provides responses to your concerns raised in the [previous memo submitted on 30 September 2025](#); namely:

- the implications of full, partial or non-funding, and
- further details around the impact of the funding contribution on Council's waste levy funds – especially with regard to current and future Waste Management and Minimisation Plan (WMMP) projects.

Please note that the memo referred to above has been incorrectly dated and should instead refer to the 30 June memo (attached as Document 15).

Options Table

The table below provides a precis of the funding options available and their implications:

Fund Option	Implications
Full funding	• Outcome: Immediate commencement of project planning and mobilisation. • Timeline Impact: No delay; preparation and development of trial can begin as scheduled. • Strategic Advantage: Position Council and Silverstream Landfill as national leaders in asbestos treatment innovation. Maximises opportunity for early access to commercial-scale rollout
Partial funding (shortfall of \$50k for co-funding)	• Outcome: EDL seeks top-up funding from aligned commercial partners or regional stakeholders. • Timeline Impact: 6 to 9-month delay expected to secure co-investment; project remains high priority within EDL's R&D pipeline but there are risks of not securing funding
Partial funding (shortfall of up to \$100k for co-funding)	• Outcome: EDL applies for competitive co-funding (eg government grants) or enters consortium negotiations. • Timeline Impact: 12 to 15-month delay anticipated due to application lead times and stakeholder alignment. EDL may maintain technical activity in parallel to reduce future ramp-up time, but there are risks of not securing funding.
No funding	• Outcome: EDL must reprioritise internal resources to focus on other funded projects. The project may be discontinued indefinitely should HCC provide no funding, or the trial may relocate to another council region with stronger co-investment potential. • Timeline Impact: 18-month, or longer, delay expected while full alternative funding is sourced. Project may not be conducted at Silverstream landfill.

Waste Levy Funds

The funding contribution from Council would come out of Council's waste levy funds.

The funding contribution amounts to about 15% of Council's annual waste levy share it receives from the Ministry for the Environment (\$2M+) and hence the contribution represents a relatively small share of the overall funding pot.

In addition, Council has also saved up over \$900,000 in its ring-fenced waste levy reserve fund (unspent funds from previous years), which means that, should the proposed Food and Green Organics Collection Service change go ahead, Council has already saved up the majority of funding it would require to enable the bin rollout (\$1.6M).

Overall, providing the funding contribution for the trial **will not** adversely affect the Climate, Waste and Resource Recovery team's ability to deliver on the WMMP projects currently underway or planned.

Moreover, the funding contribution **will not** negatively impact on rates as waste levy funds are ring-fenced.

Appendices

Appendix 1: [Silverstream Asbestos Pilot Trial Funding Risks](#)

For ease of reference, the document linked above is attached as Document 18.

Silverstream Asbestos Pilot Trial - Funding Risks

EDL has developed a proposal to carry out a pilot trial at Silverstream Landfill, focused on the treatment of asbestos and asbestos-containing materials (ACMs). Using its pilot-scale MCD system, the trial aims to demonstrate an effective and scalable solution for asbestos destruction. The goal is to validate the technology's ability to operate at landfill-relevant throughput rates, providing a foundation for future commercial-scale deployment.

The proposal is currently under review by the Hutt City Council (HCC). Should HCC choose to partially fund or not fund the pilot trial, this would directly impact the project's timeline and delivery. The financial support sought is critical to maintaining momentum and enabling timely deployment. Without the requested funding, it would be challenging to initiate this project under standard commercial terms. Securing an alternative partner would likely take considerable time, given the inherent complexities and risks associated with handling and treating asbestos.

The following scenarios outline potential delays based on varying funding outcomes:

1. Full Funding from HCC

- Outcome: Immediate commencement of project planning and mobilisation.
- Timeline Impact: No delay; preparation and development of trial can begin as scheduled.
- Strategic Advantage: Positions HCC and Silverstream Landfill as national leaders in asbestos treatment innovation. Maximises opportunity for early access to commercial-scale rollout.

2. Partial Funding from HCC (Minor Co-Funding Gap, < \$50,000)

- Outcome: EDL seeks top-up funding from aligned commercial partners or regional stakeholders.
- Timeline Impact: 6 to 9-month delay expected to secure co-investment.
- Mitigation: Minimal disruption; project remains high priority within EDL's R&D pipeline.

3. Partial Funding from HCC (Moderate Co-Funding Gap, > \$50,000)

- Outcome: EDL applies for competitive co-funding (e.g., government grants) or enters consortium negotiations.
- Timeline Impact: 12 to 15-month delay anticipated due to application lead times and stakeholder alignment.
- Mitigation: EDL may maintain technical activity in parallel to reduce future ramp-up time.

4. No Funding from HCC

- Outcome: EDL must reprioritise internal resources to focus on other funded projects. The project may be discontinued indefinitely should HCC provide no funding.
- Timeline Impact: 18-month, or longer, delay expected while full alternative funding is sourced.

EDL may consider relocating the trial to a different council region with stronger co-investment potential. This would result in lost opportunity for HCC to lead New Zealand's first asbestos pilot using a novel treatment approach.

Memorandum

Chief Executive

Director	Alison Geddes Director, Sustainability and Environment
Author	Andred Saker Senior Advisor, Resource Recovery
Reviewed by	Jörn Scherzer Head of Climate, Waste & Resource Recovery
SUBJECT	WASTE LEVY FUNDING CONTRIBUTION FOR ASBESTOS TREATMENT DEMONSTRATION AT SILVERSTREAM LANDFILL

Purpose

This memorandum seeks your approval to provide ring-fenced waste levy funding of \$365,000 to Environmental Decontamination Limited to undertake a practical demonstration of their asbestos treatment technology at the Silverstream Landfill.

Executive Summary

A waste levy funding contribution of \$365,000 to Environmental Decontamination Limited (EDL) would enable a practical demonstration of their asbestos treatment technology to proceed at the Silverstream Landfill, in line with Council's wider approach to supporting opportunities to recover resources from the construction and demolition waste stream.

EDL's technology has been validated internationally and offers a safe, viable and innovative means of permanently neutralising the harmful fibres in asbestos and asbestos-containing materials (ACMs) and transforming them into reusable commodities.

A successful practical demonstration may lead directly to the development of a commercial asbestos and ACM processing facility in Lower Hutt, in the context of efforts to improve the recovery of construction and demolition

(C&D) waste. This could position Silverstream Landfill as a hub of national significance in waste innovation.

The practical demonstration aligns with Local Action #11 of Council's Waste Management and Minimisation Plan 2023-29 and complies with section 32 of the Waste Minimisation Act 2008.

The practical demonstration would also support Council's circular economy, climate change and economic growth aspirations.

The proposed funding contribution represents around 15% of Council's annual waste levy allocation and can be made without adversely impacting the delivery of other planned waste minimisation projects or affecting rates.

Officers recommend approving the funding contribution to enable the practical demonstration to proceed without delay.

Recommendation(s)

That you approve a waste levy funding contribution of \$365,000 to EDL to undertake a practical demonstration of their asbestos treatment technology at the Silverstream Landfill.

Note that EDL are available to present on the technology and proposed demonstration if desired.

Background/Context

The Problem:

The Wellington region is currently serviced by three Class 1 municipal landfills: Silverstream, Southern, and Spicer.

Silverstream Landfill is the largest by tonnage and receives approximately 155,000 tonnes of mixed waste annually. With ongoing development, the Landfill is expected to last another 25 years.

Maximising resource recovery opportunities is critical to prolonging the life of the Silverstream Landfill and thus delaying the need to build a new landfill in Lower Hutt or the Wellington region in the future.

Construction and Demolition (C&D) waste is a significant waste stream for landfills across Aotearoa New Zealand and is estimated to make up about 69% of all waste to levied disposal facilities (class 1-4 landfills) ([MfE C&D Baseline Report, 2025](#)).

<https://environment.govt.nz/assets/publications/aste/ew-ealand-onstruction-and-Demolition-aste-aseline-and-Tracking-Methodology-report.pdf>

The tonnage of C&D waste entering the Silverstream Landfill is difficult to quantify, however the most recent Solid Waste Analysis Protocol undertaken in early 2022 estimated that C&D waste: (a) made up 22% of general waste at the landfill tip face, and (b) was the largest single activity source at the Transfer Station accounting for 47% of waste by tonnage.

A relatively small but recalcitrant (persistent and hazardous) waste stream that falls under the broader C&D waste umbrella is asbestos and asbestos containing materials (ACMs).

Asbestos is a naturally occurring group of six fibres that have been used historically for their strength, fire resistance and insulating properties in the building and construction industry.

When disturbed, the fibres can be released into the air and inhaling them can cause serious health problems, including lung cancer, mesothelioma and other lung/respiratory conditions.

Although the amount of asbestos and ACMs received at Silverstream landfill is relatively low compared to other waste streams, and asbestos disposal does not result in the generation of methane, asbestos and ACMs present a significant legacy issue due to their:

- Persistence in the environment
- Toxicity to human health
- Cumulative impact on landfill airspace.

Typically, Silverstream Landfill receives approximately 2,000 to 5,000 tonnes of asbestos or material containing asbestos per year (based on the last three years of data).

The handling of Asbestos and ACMs waste is a highly specialised and regulated industry. Only licensed practitioners with the appropriate expertise and equipment can safely remove, transport and dispose of the waste. The disposal of asbestos and ACMs at the Silverstream Landfill is confined to purpose-built cells.

The Solution:

EDL is a New Zealand owned and operated research & development company based in Auckland that has been operating in the waste sector for the past 20 years.

EDL is well known in the New Zealand and the global waste sector. They have collaborated with the following organisations:

- United Nations Development Programme
- United States Department of Defence
- United States Environmental Protection Agency
- Global Environment Facility
- University of Auckland
- Ministry of Primary Industries.

EDL strive to develop viable technologies to destroy or neutralise recalcitrant waste streams and transform them into safe, reusable commodities with commercial applications.

The current focus of EDL is to commercialise their globally patented, mechanochemical process that converts asbestos and ACMs into an inert, amorphous powder.

This powder can be safely reused as a filler in low carbon “green” concrete, thus creating a circular, value-added product from a traditionally hazardous waste stream.

Figure 1: Example of amorphous powder from the mechanochemical process



The innovative mechanochemical technology involves accelerating hundreds of ball bearings up to extremely high velocities inside a reactor where the ensuing high momentum collisions destroy the asbestos fibres and render them non-hazardous.

Figure 2: Utilising the mechanical energy of high-velocity ball bearings within specialised reactors



The Practical Demonstration

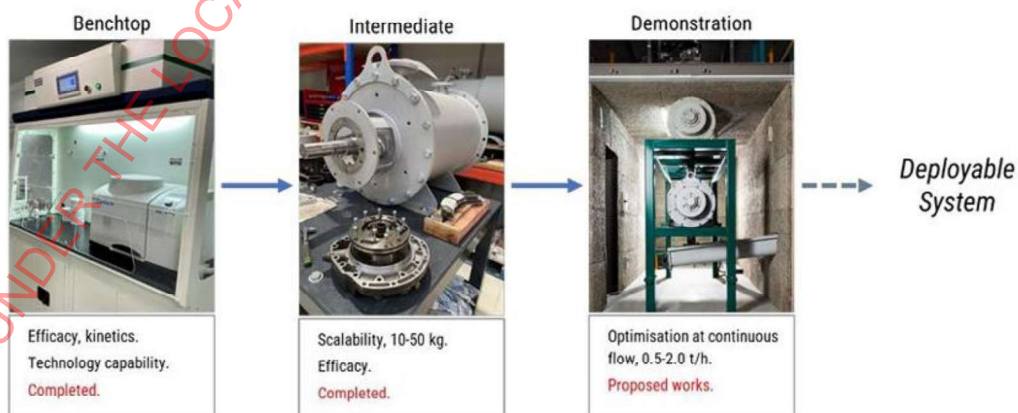
The mechanochemical technology has been validated by world class laboratories and in field experiments, including in the United States.

However, a practical demonstration of the mechanochemical technology in an operational environment is required before the technology can be scaled up to a commercial level.

The practical demonstration will involve installing two modified 40-foot containers to accommodate the plant & equipment required for the demonstration in a dedicated area at the Silverstream Landfill.

The plant and equipment will not operate continuously over the period of the practical demonstration but rather intermittently when different loads of asbestos and ACMs are tested and the outputs sent to the United States for laboratory analysis.

Figure 3: EDL's route to commercialisation



The relationship between Council and EDL was fostered after representatives from the Waste Management Institute of New Zealand advised Council officers that EDL were seeking to collaborate with a Council that owned a landfill to demonstrate their technology.

In May 2024, a [Memorandum of Understanding \(MoU\)](#) was signed between EDL and Council to enable a 6 to 12-month practical demonstration to begin at the Silverstream Landfill in early to mid-2025.

For ease of reference, the MoU mentioned above is attached as part of Document 21.

The \$5 million cost of the practical demonstration was to be jointly funded by EDL and the UK Government's Nuclear Decommissioning Authority.¹

However, the Nuclear Decommissioning Authority withdrew funding as part of a suite of cost-cutting measures by the UK Government in early 2025. This withdrawal resulted in EDL suspending the practical demonstration until such time as the shortfall could be addressed.

In exploring alternative funding options, EDL engaged with the Ministry for the Environment regarding support from the Waste Minimisation Fund. The Ministry for the Environment advised that funding from the Waste Minimisation Fund is currently earmarked for industrial scale waste infrastructure projects and that applications involving pre-commercial projects were unlikely to succeed with the current investment priorities.

However, the Ministry for the Environment did express an interest in supporting a commercial asbestos and ACM processing facility – subject to a successful practical demonstration of the technology.

The Opportunity for Council

The UK government's decision to withdraw funding has resulted in a unique opportunity for Council to intercede and fund the shortfall.

Funding the shortfall could unlock strategic, environmental, and potential economic benefits that could follow from a successful practical demonstration and subsequent commercial development.

EDL have advised Council that a successful practical demonstration may lead directly to the development of a world-class commercial asbestos and ACM treatment facility at or near Silverstream Landfill.

¹ The funding to date has been to design, build and test the specialised equipment for the practical demonstration.

The Silverstream Landfill would be the ideal location for a commercial asbestos and ACM plant given the Landfill's existing resource consent framework, proximity to major urban centres and accessibility to transport networks.

A commercial plant could serve Lower Hutt, the Wellington region and the Lower North Island.

By supporting the practical demonstration, Council would:

- Proactively address a hazardous C&D waste stream.
- Complement Council's other waste diversion initiatives, including other C&D waste reduction projects and initiatives.
- Position Silverstream Landfill as a genuine leader at the cutting-edge of waste innovation.

EDL have provided a detailed [proposal](#) for the asbestos treatment practical demonstration with the funding shortfall covered by Council.

For ease of reference, the proposal mentioned above is attached separately as document 14.

The practical demonstration would initially process asbestos and ACMs, but the versatile nature of the mechanochemical technology means it can be easily adapted to process contaminants such as persistent organic pollutants (POPs)² and Perfluoroalkyl and Polyfluoroalkyl substances (PFAS).³

POPs and PFAS are some of the most difficult and harmful contaminants known to the international waste community. Waste contaminated with these substances has also been disposed at Silverstream in the recent past, such as PFAS contaminated soil from the Ohakea airbase.

If the demonstration results in the development of a commercial plant, then this would complement the potential Soil and Aggregate Recycling Facility (SARF) that is currently under investigation in a collaboration between Council and Fulton Hogan.

² Persistent Organic Pollutants (POPs) are toxic chemical substances that persist in the environment, bioaccumulate through the food web and pose risks to human health and ecosystems.

³ Polyfluoroalkyl Substances (PFAS) are a group of synthetic chemicals used in industrial and consumer products for their resistance to heat, water, and oil. PFAS are highly persistent in the environment and have been linked to a range of adverse health effects

The SARF would process high volume, low contamination waste soils and aggregates, whereas the EDL commercial plant would treat low volume, high contamination materials.

Together, these facilities could establish Silverstream Landfill as a national waste innovation hub, supporting both environmental leadership and regional economic development.

Moreover, representatives from the C&D industry have advised Council officers that not having a safe and viable means of disposing of asbestos, ACMs and other recalcitrant waste streams could inhibit future infrastructure development in the Wellington region.

Figure 4: Example of an overseas SARF



Benefits of the Investment

The benefits of a commercial asbestos and ACM plant, if built, are summarised below.

Environmental Benefits:

- Reduced greenhouse gas emissions from avoiding landfill expansion (construction work) and reducing the transport of waste to distant or offshore facilities.
- Avoided biodiversity loss associated with future landfill development.
- Conservation of landfill airspace for residual waste that cannot be diverted or recovered.
- Reduced handling and landfilling of harmful and toxic materials.
- Less pollution discharged into soil, air and water systems.

- Tangible implementation of circular economy principles through material recovery and reuse.

Council Benefits:

- Deferred capital expenditure by delaying the need for new landfill cell construction or new disposal solutions.
- Opportunity for Hutt City Council to host a nationally significant asbestos and ACM treatment facility.
- Potential to generate new revenue streams through gate fees from regional and national asbestos and ACM waste accepted for treatment.
- Opportunities to collaborate with research institutions on applied innovation in waste treatment, materials science and clean technology.
- Strengthened alignment with the Council's climate action and sustainability commitments.
- Supports delivery of Local Action #11 in Council's Waste Management and Minimisation Plan.

Broader Benefits:

- Opportunity for local businesses to grow and upskill in support of EDL's specialised supply chain.
- Creation of local market opportunities through the reuse of EDL's inert byproducts (e.g. green concrete fillers).
- Potential for new product lines or resale markets based on recovered outputs.
- Licensing or franchising potential of the technology to other jurisdictions or councils.
- Educational opportunities for schools and universities to engage with practical sustainability initiatives.
- Promotes Lower Hutt as a national hub for clean technology, environmental innovation, and sustainable industrial leadership supporting talent attraction and further investment.

Source of Funding

The funding contribution from Council would come out of Council's waste levy funds.

The funding contribution amounts to approximately 15% of Council's annual waste levy share received from the Ministry for the Environment (\$2M+) and hence represents a relatively minor share of the overall funding pot.

Council has also saved up over \$1.5M in its ring-fenced waste levy reserve fund (unspent funds from previous years), meaning that should the FOGO service go ahead, Council has already saved up most funding required to enable the bin rollout (\$1.6M).

Providing the funding contribution for the practical demonstration will not (a) adversely affect the Climate, Waste and Resource Recovery team's ability to deliver on projects currently underway or planned, or (b) negatively impact on rates as waste levy funds are ring-fenced for waste minimisation purposes.

Section 32 of the Waste Minimisation Act 2008 stipulates that territorial authority waste levy funds must be spent *(1) on matters to promote or achieve waste minimisation; and (2) in accordance with its waste management and minimisation plan.* <https://www.legislation.govt.nz/act/public/2008/89/en/latest/#DLM1154603>

Funding the practical demonstration at Silverstream Landfill aligns with the Waste Management and Minimisation Plan Local Action #11 to "Investigate current, new and emerging technologies and/or approaches that support the future of waste disposal." [Pg. 43]

For ease of reference, the Waste Management and Minimisation Plan mentioned above is attached as part of Document 6.

Investment Options

The table below provides a precis of the investment options available and their implications:

Table: investment options and implications

Investment Option	Implications
Full funding (\$365,000)	- Outcome: Immediate commencement of project planning and mobilisation. - Timeline Impact: No delay; preparation for the practical demonstration can begin as scheduled.

Investment Option	Implications
	Strategic Advantage: Position Council and Silverstream Landfill as national leaders in asbestos treatment innovation. Maximises opportunity for early access to commercial asbestos and ACM plant at or near Silverstream Landfill.
Partial funding (shortfall of up to \$50k)	- Outcome: EDL seeks top-up funding from aligned commercial partners or other regional stakeholders. - Timeline Impact: 6 to 9-month delay expected to secure co-investment; project remains high priority within EDL's R&D pipeline but there are risks of not securing funding.
Partial funding (shortfall of up to \$100k)	- Outcome: EDL applies for competitive co-funding (e.g. government grants) or enters consortium negotiations. - Timeline Impact: 12 to 15-month delay anticipated due to application lead times and stakeholder alignment. EDL may maintain technical activity in parallel to reduce future ramp-up time, but there are risks of not securing funding.
No funding	- Outcome: EDL must reprioritise internal resources to focus on other funded projects. The project may be discontinued indefinitely should Council provide no funding, or the practical demonstration may relocate to another council region with stronger co-investment potential. - Timeline Impact: 18-month, or longer, delay expected while full alternative funding is sourced. Practical demonstration may not be conducted at Silverstream landfill.

Risks Associated with Investment

Financial Risk to Council

In light of potential financial risks, officers commissioned independent consultancy Abbot Consulting to undertake due diligence on EDL. The due diligence report made the following recommendation:

For ease of reference, the due diligence report mentioned above is attached as part of Document 21.

"This due diligence review process has provided no alarms or concerns regarding the initiation of a partnerships trial approach as suggested and recommends that Council proceed with this trial as proposed." [pg. 4]

Potential financial risks can be mitigated by adopting a staged approach to making payments to EDL subject to the successful completion of certain milestones:

- 50% of the total cost (\$182,000.00) to be released at the commencement of the project to cover initial costs.
- 30% of the total cost (\$109,000.00) to be released upon delivery of equipment to the Silverstream Landfill site.
- 20% of the total cost (\$73,000.00) upon delivery and acceptance of final report to Council.

Reputational Risk

There is a possibility of negative publicity for the Council if the practical demonstration is unsuccessful.

This risk is inherent with the demonstration of any new technology. However, the risk has been partially mitigated by undertaking independent due diligence, which found no concerns with proceeding to the practical demonstration phase.

In particular, the due diligence report: (a) cited validation of EDL's technology by world-class laboratories from different countries, and (b) recognition and/or endorsement of the technology in respected international publications and research journals. *For ease of reference, the due diligence report mentioned above is attached as part of Document 21.*

In June 2025 EDL won the Waste Management Institute of New Zealand excellence award for the most sustainable and innovative waste disposal initiative in New Zealand. <https://www.wasteminz.org.nz/conference/awards-for-excellence-2025>

Operational Risks

The handling and processing of asbestos and ACMs carries inherent health and safety risks. These risks have been proactively mitigated through a collaborative approach involving:

- EDL as the expert lead for all safe handling, containment, and treatment procedures for asbestos and ACM in accordance with regulatory and industry requirements.
- Tonkin & Taylor as the technical consultancy appointed by Council to support the management of the Silverstream Landfill including all projects, activities and monitoring & compliance work.
- Waste Management NZ as the contracted landfill operator, providing day-to-day oversight of site operations in coordination with EDL's delivery and operations team.

The details required to facilitate the safe and efficient organisation of the practical demonstration are encapsulated in the original [MoU](#) that was signed between Council and EDL in May 2024.

Resource management risks have been minimised by Tonkin & Taylor submitting an [Outline Plan](#) that was [approved](#) by Council's resource consents team on 12 December 2024.

Procurement Risks

EDL is the world leader of mechanochemical technology and is the only known company in the world that can deliver the practical demonstration.

A [tender exemption](#) enabling EDL to be directly sourced has been endorsed by the Procurement team.

Consultation

In developing this memorandum, the resource recovery team have engaged with the following business units:

- Business & Economy
- Procurement
- Legal

For ease of reference, the Outline Plan mentioned above is attached as part of Document 15 and the MoU is attached as part of Document 21.

People Implications

The practical demonstration will be resourced and managed entirely by EDL employees.

As such, any wellbeing and workforce considerations will be the responsibility of EDL and subject to their own policies, practices and procedures.

Financial Implications

If approved, the funding contribution will come from Council's levy funds, which are currently used to fund a range of waste minimisation projects, initiatives and activities.

Partial funding of the practical demonstration will result in a protracted or indefinite delay of the practical demonstration while EDL source additional funding to cover the shortfall.

Legal Implications

The use of waste levy funds for the purposes of the practical demonstration is consistent with [section 32 of the Waste Minimisation Act 2008](#).

<https://www.legislation.govt.nz/act/public/2008/89/en/latest/#DLM1154603>

The use of Silverstream Landfill for the practical demonstration is consistent with the Landfill's existing resource consent framework as described in the [Outline Plan](#) and [approved](#) by Council's Resource Consents team.

For ease of reference, the Outline Plan mentioned above is attached as part of Document 15.

Technology and Privacy Implications

The mechanochemical process that underpins the EDL technology is commercially sensitive and is protected by New Zealand and International patents to guard against intellectual property theft.

The [MoU](#) includes confidentiality/non-disclosure provisions to help safeguard proprietary information, trade secrets and other potentially sensitive information associated with EDL's technology.

EDL have confirmed they will provide Council with data, results and other information relating the practical demonstration, which may have to be withheld under [section 7\(2\)\(b\)\(ii\) of the Local Government Information and Meetings Act 1987](#) if disclosure would prejudice commercial interests.

For ease of reference, the MoU and due diligence report mentioned above is attached as part of Document 21.

Climate Change Implications

There are emissions associated with undertaking the practical demonstration, but they are not considered significant.

As noted previously, a potential future commercial asbestos and ACM plant in Lower Hutt could achieve emission savings by avoiding the need to dispose of recalcitrant waste streams to landfill (avoided landfill air space construction) or transporting waste to distant and/or international processing facilities.

Furthermore, a commercial asbestos and ACM plant located at the Silverstream Landfill could fully operate on electric power due to Council's recent investment in a heavy-duty EV charging hub onsite.

Health, Safety and Security Implications

The [MoU](#) requires EDL to provide Council a comprehensive health and safety plan for approval to safeguard the ongoing health and safety of all parties associated with the practical demonstration.

For ease of reference, the MoU mentioned above is attached as part of Document 21.

The demonstration plant and equipment have been designed in such a way that physical handling of raw asbestos and ACMs by people is not required.

Communication and Engagement

Council has been providing regular updates on the intended practical demonstration through committee papers to the Climate Change and Sustainability Committee.

Next steps

Note that EDL are available to present on the technology and proposed demonstration to you.

If you approve the funding contribution, the following steps will occur:

A contract between EDL and Council will be signed giving effect to the funding contribution.

EDL have confirmed that once funding has been received, the demonstration plant and equipment would be transported, installed and commissioned at Silverstream Landfill over the next few months.

Council officers will liaise with EDL and Waste Management NZ to ensure that all facets of the practical demonstration will run as smoothly and efficiently as possible.

Attachments

There are no attachments to this paper.

RELEASED UNDER THE LOCAL GOVERNMENT OFFICIAL INFORMATION AND MEETINGS ACT 1987

12 December 2024

Hutt City Council
c/- Tonkin and Taylor

s7(2)(a)

s7(2)(a)

s7(2)(a)

Senior Consultant Planner
@urbanedgeplanning.co.nz
Our reference: RM240326

Dear Hutt City Council,

Outline plan decision for undertaking a trial asbestos destruction programme at Silverstream Landfill located at 21A-C Reynolds Bach Drive, Stokes Valley (Section 7 Survey Office Plan 461420)

I have considered your outline plan for works in accordance with the purpose of HCC 7 in the District Plan being sanitary landfill at Silverstream Landfill. No changes are requested.

The following report sets out the details of the proposed works and the reasoning for the above decision.

THE PROPOSAL

As set out in s176A of the RMA the applicant has provided information with respect to the requirements of the Act. These relate to the follow matters:

- *the height, shape, and bulk of the public work, project, or work; and*
- *the location on the site of the public work, project, or work; and*
- *the likely finished contour of the site; and*
- *the vehicular access, circulation, and the provision for parking; and*
- *the landscaping proposed; and*
- *any other matters to avoid, remedy, or mitigate any adverse effects on the environment.*

Hutt City Council as the Requiring Authority are proposing to undertake a trial asbestos destruction programme at Silverstream Landfill. It is proposed to install and use a Mechanochemical Destruction (MDC) Reactor to break down asbestos fibres.

The proposed works will include:

- Installation of three container building/structures with dimensions of 6.06m (length) x 2.44m (width) x 2.89m (height) which will contain the MCD technology. These containers will be placed adjacent to each other, in a block.
- Minor earthworks for the levelling and compaction of the site prior to installation of the container structures.
- Operation and use of the MCD reactor to break down asbestos fibres.

- Access to the site will continue to be provided off Reynolds Bach Drive. Vehicles will use the existing roads onsite where possible to access the top of the landfill and the asbestos disposal cell area. No new manoeuvring or parking areas are proposed for the works.

The location of the proposed containers is shown in Figure 1 below.

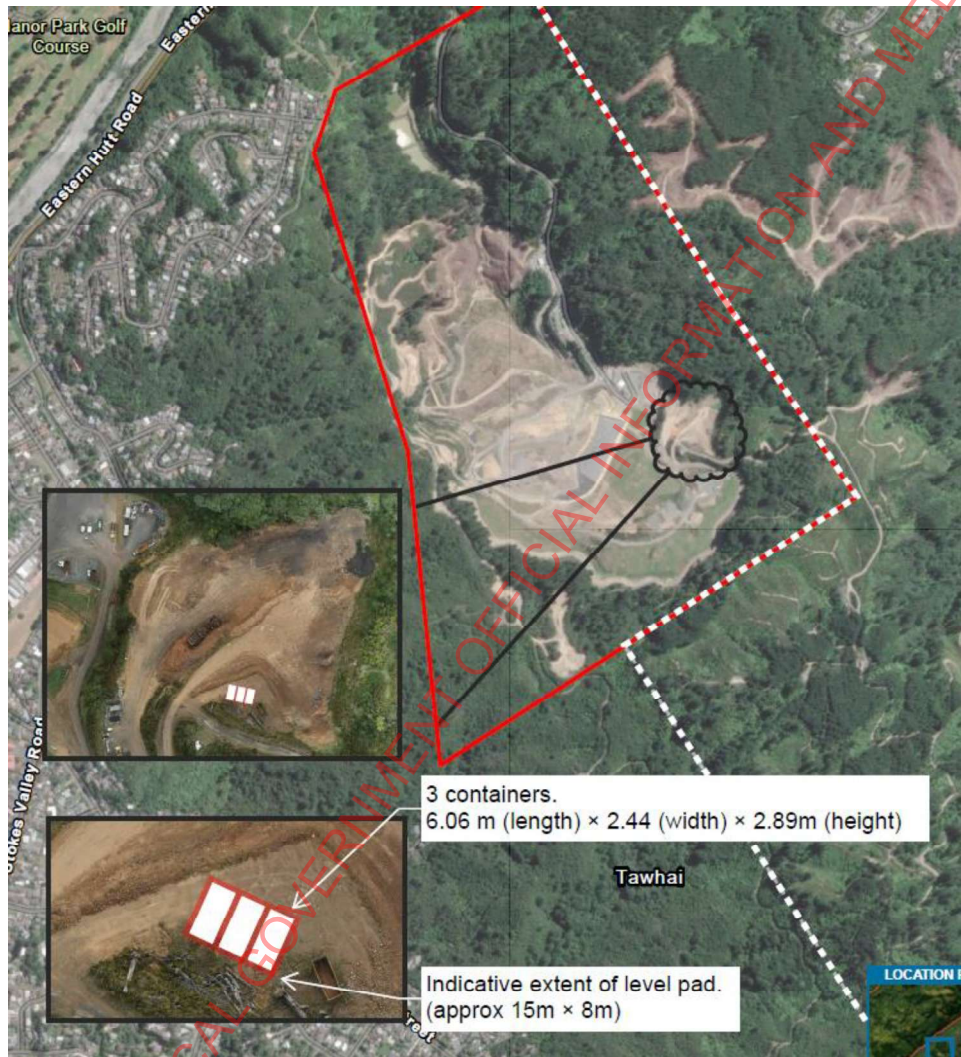


Figure 1: Location of the proposed containers. Source: Application.

Consent under the National Environmental Standard For National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health is not required as the designation had been given effect to before the NES was enacted in 2011. An existing designation prevails over a NES unless the designation lapses or is altered and there have been no changes to the design. It is further noted that, as per Section 1.3 of the application:

The entire Silverstream Landfill site is listed on the Greater Wellington Regional Council Selected Land Use Register (File No. SN/03/002/02). The proposed works are located in the eastern borrow area of the site which has only previously been used to obtain material to support landfill activities on the site and therefore not subject to Hazardous Activities and Industries List (HAIL)

activities. As such, we do not consider that the National Environmental Standard for Assessing and Managing Contaminants in Soil (NES – Soil) to Protect Human Health applies to proposed works.

SITE DESCRIPTION

The works will take place wholly within Section 7 Survey Office Plan 461420 which has the addresses 21A-C Reynolds Bach Drive, Stokes Valley. The site has been an operational landfill since the 1970s. The landfill operation is set out in stages as described in section 2.2 of the application:

- Stage 1 is the original landfill that operated at the head of the gully from the 1970s to 1998;
- Stage 1A sits above stage 1 and was constructed between 1998 and 2009. Stage 1A has a clay liner and leachate collection system. Filling in stage 1A has ceased but this area is still used for disposal of special waste, such as asbestos; and
- Stage 2 is the main area of filling down gully of stage 1 and 1A. Stage 2 consists of a fully lined landfill, designed with a geo-synthetic plus clay lining system.

On 22 September 2023, an outline plan was accepted under RM230222 to expand the asbestos disposal operations at the landfill. On 5 October 2023, an outline plan was accepted under RM230203 for enabling works to develop phase 3 of stage 2 of the landfill.

The District Plan states the designation applies to Lot 1 DP 27329 which does not match the Record of Title 626430 for the site as Section 7 Survey Office Plan 461420. In reviewing the Record of Title and gazette notice, the third schedule of the 2013 notice identifies the land set apart for a disposal facility which includes a 94.2-hectare property described as Part Lot 1 DP 27329 shown as Section 7 Survey Office Plan 461420. The below figures (see figure 2 and 3) show the boundaries of the designation and the area of Section 7 Survey Office Plan 461420 in alignment. Therefore, it can be considered the works will take place within the bounds of the designation boundaries.

The underlying zoning of the site is Passive Recreation Activity Area. The National Grid Corridor Line is located along the western extent of the site, linking to the Haywards Electric Substation on the western side of SH2, near the Haywards Interchange. The site is located on the boundary of Hutt City Council jurisdiction where it adjoins Upper Hutt City Council.

The south-west corner of the site (approximately 95,000m²) is subject to Significant Natural Resource 50 which is Stokes Valley Bush and has the following attributes as described in chapter 14E of the District Plan:

Lowland forest on hill country, containing the only Pukatea forest remnant in the region. Bird species include Whitehead. Common Green Gecko, and Kotukutuku plant species.

There are no other relevant notations or site-specific provisions in the District Plan.

The site is subject to a statutory acknowledgement area and was referred to Ngāti Toa Rangatira and Taranaki Whānui on 24 October 2024. At the time of writing this report, no feedback on the application had been received.

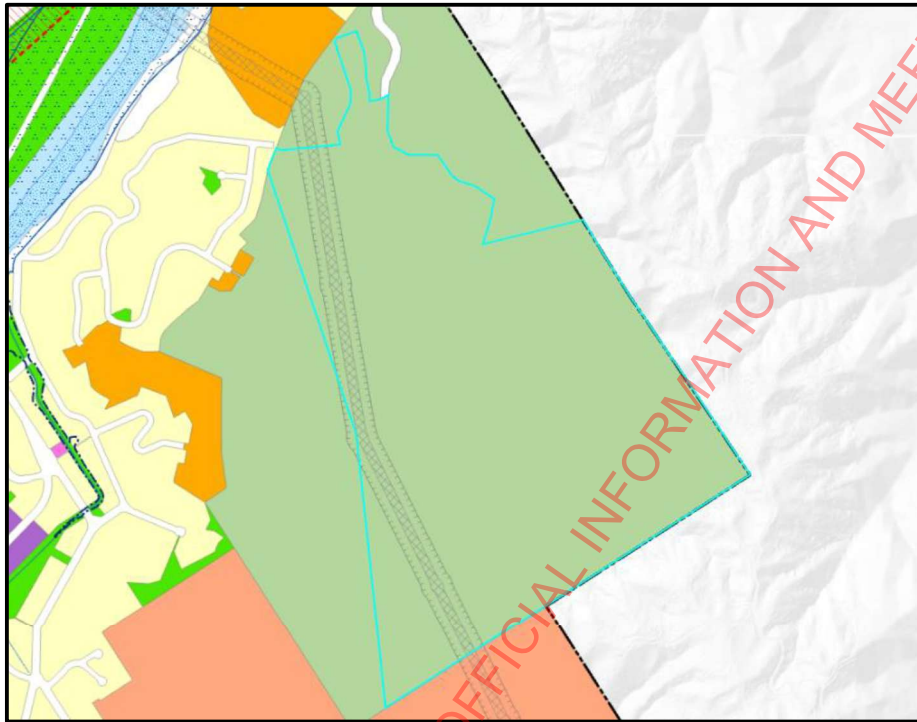


Figure 2: District Plan map with property outline in blue. Source: <https://maps.huttcity.govt.nz/HuttCityMapsViewer>

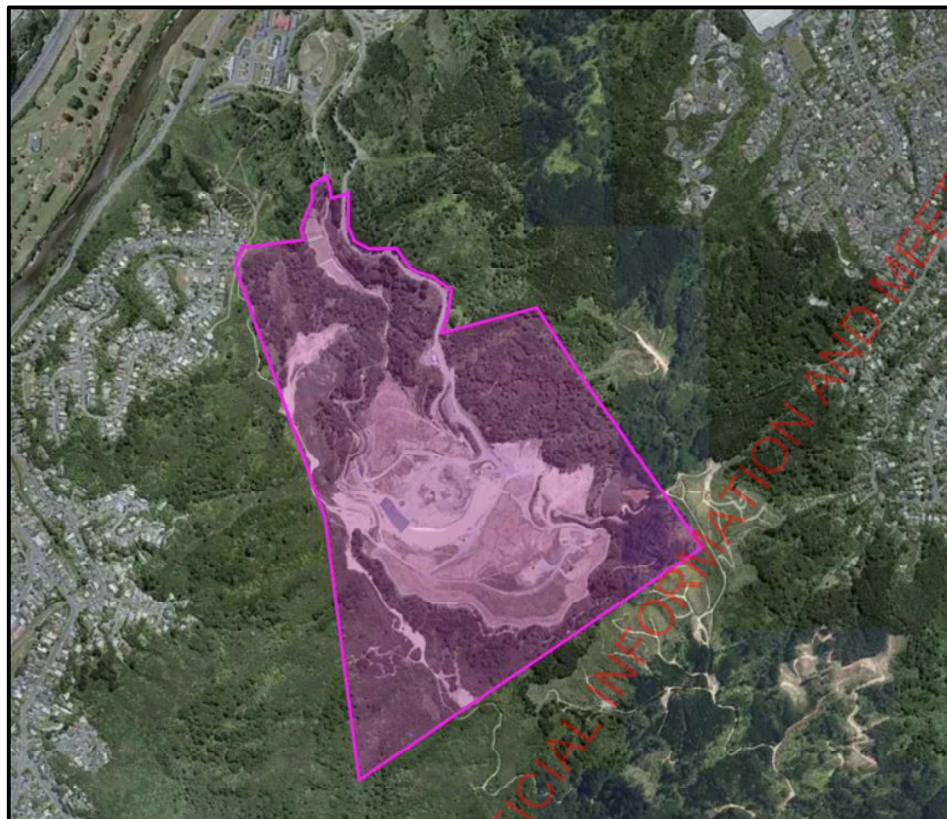


Figure 3: LINZ property search of Section 7 SO Plan 461420. Source <https://lrs.linz.govt.nz/search/titles/626430>

OUTLINE PLAN/EFFECTS ASSESSMENT

The matters that council should consider is the information outlined under s176A including the extent of the environmental effects of the proposed works informed by any relevant conditions of the designation. There are no conditions in the District Plan for designation HCC 7 which is for the purposes of sanitary landfill (Silverstream).

Section 176A of the act requires the council to consider any environmental effects resulting from the work contained in the outline plan.

The effects I have identified are:

- Earthworks effects
- Hazardous substances/contamination effects
- Construction effects
- Noise and vibration effects
- Visual effects
- Cultural effects

Earthworks effects

The applicant has outlined the following in their email dated 10 December 2024: *We have attached a brief Erosion and Sediment Control Plan (ESCP) to support the Outline Plan prepared for the proposed EDL works at Silverstream Landfill. The extent of the building footprint for the proposed container structures is 60m². Any earthworks undertaken will be minor and limited to the building footprint and immediate surrounding area. In the wider scheme of the Silverstream Landfill site, which is an operating landfill and borrow site, the proposed plan clarifies and contextualises the options for managing stormwater noting that these will feed into the wider stormwater network. There is also an existing full ESCP to manage stormwater over the wider landfill site.*

The ESCP provided by the applicant outlines that the proposed earthworks area will be graded to channel any stormwater towards the existing overland flow path to the existing decanting earth bund (DEB), after which it will outflow to the stormwater network. The DEB is part of the existing erosion and sediment control methods for the Silverstream Landfill as a whole. Given these methods, combined with the scale of the site and distance of the location of the proposed earthworks from the boundaries of the site, it is considered that any potential adverse effects associated with earthworks will be acceptable.

Hazardous substances/contamination effects

The applicant has advised (in Section 4.1.6.2) of the application that there is an existing Asbestos Management Plan (AMP) pertaining to the site, which was prepared for previous asbestos relating works on the site including the acceptance, handling and disposal of asbestos. As per Section 4.1.6.2 of the application:

The AMP is required under the:

- *Health and Safety at Work (Asbestos) Regulations 2016.*
- *Work Safe Approved Code of Practice for the Management and Removal of Asbestos (2016).*
- *Waste MINZ 'Waste industry guidelines to manage the collection, receipt, transport and disposal of asbestos waste (2019).*

The existing AMP is an operational document that sets out the practices and procedures to be implemented by Waste Management to protect human health when receiving and disposing of asbestos material onsite. This includes:

- *Disposal in a special waste location.*
- *Personnel protective equipment.*
- *Excluding unauthorised access and signage.*
- *Unloading procedures (Hi-ab or hand unloading); and*
- *Air monitoring.*

It is considered that adherence to the AMP (which meets requirements of the relevant regulations and standards) will ensure that any potential adverse hazardous substances/contamination effects are acceptable.

Construction effects

In addition to the discussion of earthworks effects above, given the small scale of the construction required to facilitate the MCD Reactor, it is considered that any additional noise and vehicle movements are unlikely to be discernible from the general operation of the existing landfill and will therefore be acceptable.

Noise and vibration effects

The applicant has outlined the following with regard to noise and vibration: *The operation and use of the MCD Reactor may result in adverse noise and vibration effects. However, as proposed works are fully contained within the landfill site and are not located in close proximity to sensitive activities (residential), potential noise and vibration effects will be minimal.*

It is further noted that as a designated site the activity is not required to meet the noise limits of the underlying District Plan zone but it is reasonable to expect noise from the MCD Reactor may be different to noise typically generated by the landfill. In any respect the nearest residential properties (which are more sensitive to noisy activities and vibration) are located on Wyndham Road (within Upper Hutt) to the east of the site of the MCD Reactor which have approximately 750m separation which provides a buffer for these properties.

It is also noted that the landfill management plan addresses noise, noting the below section of this plan that landfill operation and construction will meet NZS6803:1999 (replaced NZS6803P:1984). Therefore, the noise and vibration effects from the proposed works are considered acceptable.

4.17 Noise

The Landfill's design, construction and operating procedures incorporate measures specifically aimed at mitigating excessive noise impacts from the operation, and ensuring compliance with NZS6801:1991 Methods of Measuring Noise and NZS6802:1991 Assessment of Noise in the Environment. To achieve this, appropriate and well-maintained machinery will be used at the Landfill.

It has been shown that use of well-maintained machinery has a marked effect on noise and all machinery at the site will be regularly inspected and monitored to ensure that operation of faulty or inappropriate machinery is avoided. During construction periods, all contractors at the site will be required to use only machinery which ensures that work complies with the requirements of NZS6803P:1984.

Visual effects

The proposed container structures are small in height and area and are well setback from the nearest residential property, which is located approximately 750m away. Due to their small extent, they will not be readily visible on the landscape as viewed from the wider environment. It is considered that any visual effects will be acceptable.

Cultural effects

The site is subject to a statutory acknowledgement for Ngāti Toa Rangatira and Taranaki Whānui. The statutory acknowledgement appears to be associated with a stream that runs through the site that discharges to Te Awa Kairangi as shown on the image below.

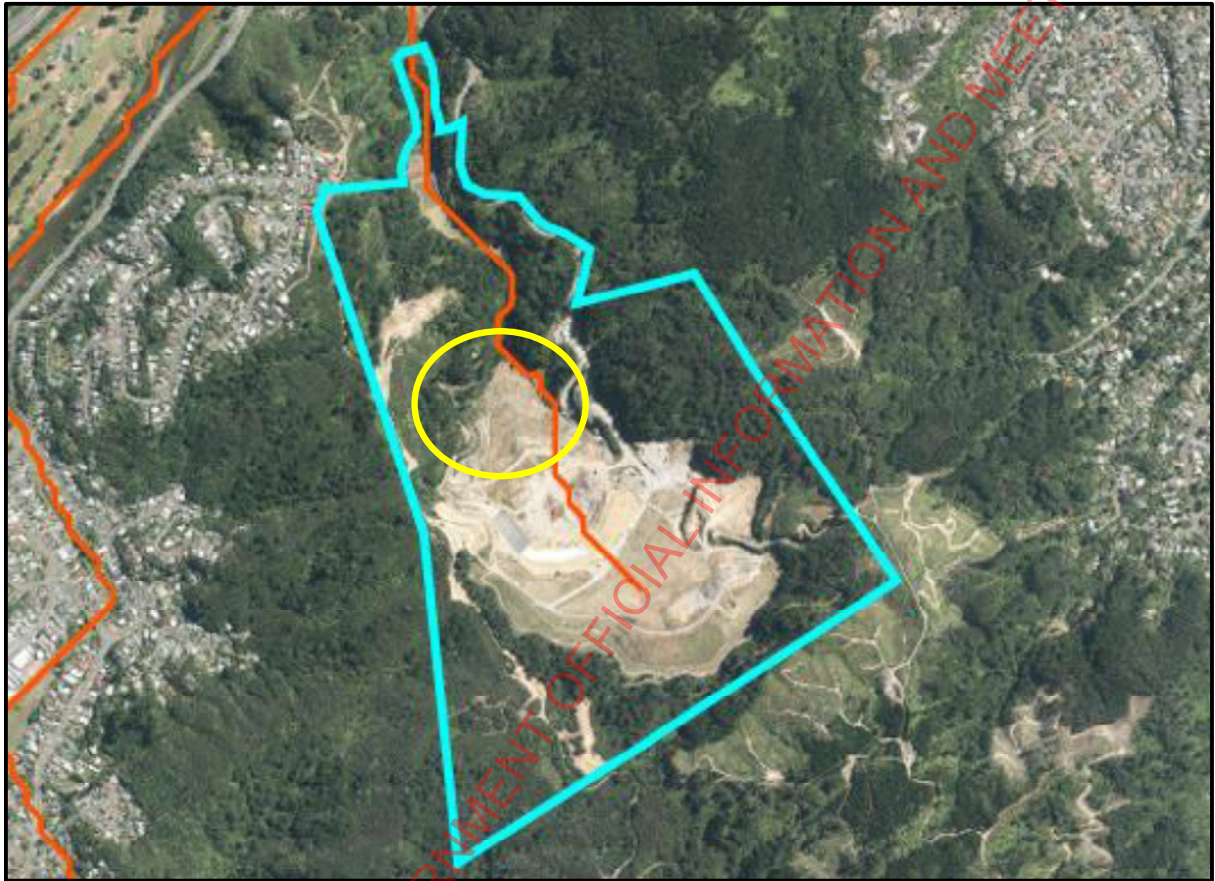


Figure 5: Statutory acknowledgement shown in red and broad indication of area of works in yellow.

Notice of the outline plan was provided on 24 October 2024 to Ngāti Toa Rangatira and Taranaki Whānui and a response hadn't been received at the time of writing this report (11 December 2024). As noted in the earthworks assessment above, the RA has prepared a site-specific erosion and sediment control plan to manage effects such as runoff into the stream. These measures will manage the impacts of the works on the waterbody that is of significance to tangata whenua.

Conclusion

The proposed works are consistent with the designation of the site and the overall environment effects are considered acceptable.

NOTES

There may be bylaws relevant to your proposal that may require separate council approval before you start site works. A full list of the bylaws can be found at www.huttcity.govt.nz. You should not start any building work until you get a building consent.

Please note that this outline plan relates to the application as lodged with the council. Any changes to your proposal may require a new outline plan and payment of another application fee.

Yours sincerely,

s7(2)(a)

s7(2)(a)

Consultant planner for HCC

Peer reviewer:

s7(2)(a)

s7(2)(a)

Consultant Resource Consents Planner

Delegated authority for approval:

s7(2)(a)

Anna Martin
Resource Consents and Compliance Manager

Application lodged: 23 October 2024

Fee paid: 27 November 2024

Application approved: 12 December 2024

Working days to process: 36

S37 extension days: 19

**Memo****To:** Alison Geddes, Director, Environment & Sustainability**CC:** Procurement, Jörn Scherzer, Aviva Stein**From:** Andred Saker, Senior Advisor, Resource Recovery**Date:** 14/6/2025**Security level:** In Confidence**Exemption to tender for EDL Pilot****Endorsed By:**

Jörn Scherzer Head of Climate, Waste &
Resource Recovery

s7(2)(a)

Date 30/6/2025

Fortune Tlapi Head of Procurement

s7(2)(a)

Date 15/06/2025**Action:**

Based on the reason(s) outlined in this memo, please approve this exemption to a competitive tender process for the EDL asbestos treatment pilot at the Silverstream Landfill.

I, Alison Geddes (appropriate DFA Holder) approve the recommended approach as outlined in this memo.

Signature_____
Date**Comments:**

Purpose:

1. The purpose of this memo is to seek an exemption from going to an open market tender for the proposed EDL asbestos treatment pilot at the Silverstream Landfill.

Background

2. The class 1 Silverstream Landfill is owned by Hutt City Council and is one of a limited number of landfills in the North Island of New Zealand that accept asbestos and asbestos containing materials (ACMs) for disposal.
3. The disposal of asbestos and asbestos containing materials is problematic at Silverstream Landfill and other landfills due to the hazardous nature of the waste and the significant volumes/tonnages involved.
4. Environmental Decontamination Limited ("EDL") is a New Zealand owned and based R&D company that have been developing contaminant remedial technology for the past 20 years.
5. The technology has been validated in laboratories by world class institutions in the USA and Europe, but a practical demonstration (i.e. a pilot) is required before it can be scaled up to process industrial tonnages of asbestos and ACMs.
6. The proposed pilot will consist of installing two specially modified 40-foot containers that will house the plant & equipment required for the pilot in the borrow area of the Silverstream Landfill.
7. The proposed pilot was jointly funded by EDL and the UK Government's Nuclear Decommissioning Authority and according to figures released by EDL and has cost approximately \$5 million to date.
8. The Nuclear Decommissioning Authority withdrew funding as part of a suite of cost-cutting measures by the UK Government in early 2025 resulting in the pilot being suspended.
9. The Council is proposing to fund the shortfall to enable the proposed pilot to continue and realise the significant benefits to Council and Lower Hutt city that a pilot and subsequent industrial plant could bring.

Reasons for a Direct Source Approach

10. The EDL technology involves a complex mechanochemical process to neutralise the harmful molecular structure of asbestos fibres and results in the production of an inert, amorphous powder that has significant reuse potential as a filler in the cement industry.
11. The advantages of using a mechanochemical process to destroy asbestos fibres instead of other processes is that it does not require expensive industrial applications of heat, pressure and/or chemical catalysts to achieve the same outcome.
12. The technology was first trialled by EDL in Johannesburg in 2015 and has since then evolved to the point where a successful pilot at the Silverstream Landfill will act as the precursor for an industrial size plant.

13. The value of the technology comes not only from the suite of global patents but more importantly from the cutting-edge nature of the plant and the knowledge/experience required to treat asbestos and ACMs using the mechanochemical process.
14. This value means that EDL are world leaders in the mechanochemical destruction of asbestos and ACMs and therefore the only company globally that can offer this technology at a pre-industrial level at present.
15. The proposed pilot will only treat relatively minor tonnages of asbestos and ACMs, but an industrial plant located in Lower Hutt city has the potential to significantly reduce the amount of local, regional and potentially national asbestos and ACMs being disposed of at landfill.

Financial Commitment:

16. The Council is proposing to fund the \$365,000.00 shortfall left by the UK Government by using funds from the waste levy in accordance with the our current [Waste Management and Minimisation Plan \(https://www.huttcity.govt.nz/services/rubbish-and-recycling/waste-management-and-minimisation-plan-wmmp\)](https://www.huttcity.govt.nz/services/rubbish-and-recycling/waste-management-and-minimisation-plan-wmmp)
17. If approved, the Council will enter a contract to undertake a 6–12-month pilot of their asbestos treatment technology at the Silverstream Landfill and will include provisions that directly and indirectly benefit Council and Lower Hutt city.

Recommendation

18. It is recommended that, for the reasons outlined in this memo you approve the direct sourcing of this contract to EDL for the purposes of undertaking a pilot of their asbestos treatment technology at the Silverstream Landfill.



Climate Change and Sustainability Committee

21 August 2025

Report no: CCASC2025/4/249

Update on solid waste management and minimisation work streams

Purpose of Report

1. This report consolidates information on the status of Council's solid waste management and minimisation initiatives.
2. Detailed and regular information on the ongoing development, operation and performance of the Silverstream Landfill is covered in a separate report to the Hutt Valley Services Committee. The latest update is available in [report number HVSC2025/4/93 from 22 August 2025](#).

Recommendation

That the Committee receives and notes the update on various waste management and resource recovery matters.

Implementation of Wellington Region Waste Management and Minimisation Plan 2023-2029 (WMMP)

3. WMMP implementation by officers of the Wellington Region councils continues, including through regional projects. To provide the Committee with a regular progress update on the projects underway or planned to meet the Hutt City Council local actions under the WMMP, an updated project dashboard is shown in **Appendix 1**.

Strengthening the Wellington Region Waste Forum R3 project

4. Hutt City Council recently hosted the Wellington Region Waste Forum at the Dowse Art Museum. This was a successful event with 85 attendees from across Councils, NGOs and the waste industry. Speakers from Nonstop Solutions, Fillgood, Enviroschools, BRANZ, Ministry for the Environment, WM New Zealand and Tonkin & Taylor spoke on the theme of *Lifting the Lid on Waste – Turning Insights into Action*.

5. One of the new large side-loader electric trucks was available for viewing during the event on the Dowse Square, with a view to encouraging other councils and organisations to consider going electric.
6. The next Forum will be hosted by Porirua City Council in February 2026.

Tikanga Māori waste minimisation initiative support

7. Officers have commenced scoping a new project to support the delivery of Action 1 in the Local Action Plan, aligned with the WMMP. The objective of this project is to: *"Provide support to local iwi groups and/or other organisations that provide tikanga Māori perspectives on waste minimisation initiatives."* Initial discussions have been held with Kāhui Mana Whenua to explore opportunities for partnership and to shape the direction of this project.

Battery Recycling

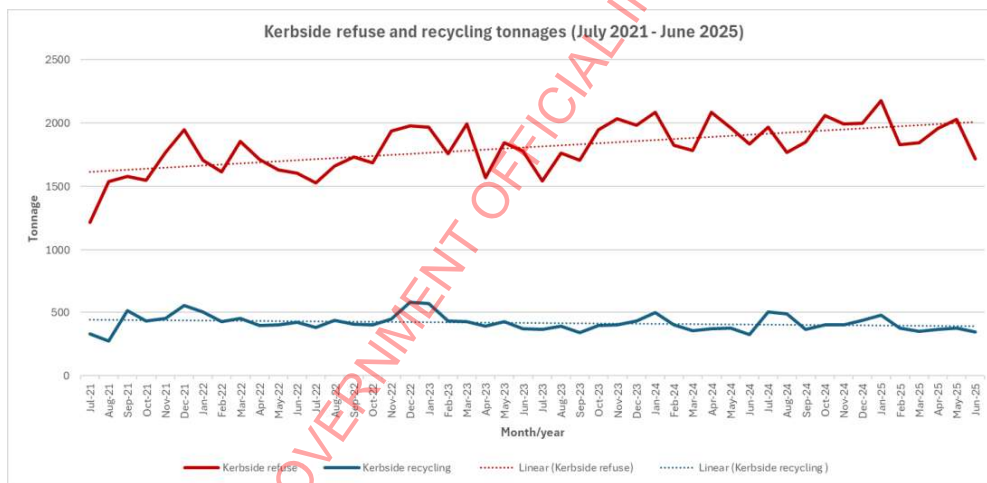
8. Battery recycling collection is scheduled to commence in September 2025. As of 21 August 2025, deliveries and staff inductions are being coordinated, and designs aligned with the Too Good To Waste campaign are being finalised.
9. An example of the near-final design of the collection units is shown below, with an indication of approximate scale also:



Silverstream Landfill capacity and Future of Residual Waste Disposal Project

10. It was highlighted in the WMMP that the region's three main landfills (Southern, Spicer and Silverstream) have limited lifespans over the coming decades. Based on recent waste disposal volumes, Silverstream Landfill has a remaining life of about 24 to 29 years, depending on the settlement of the waste.

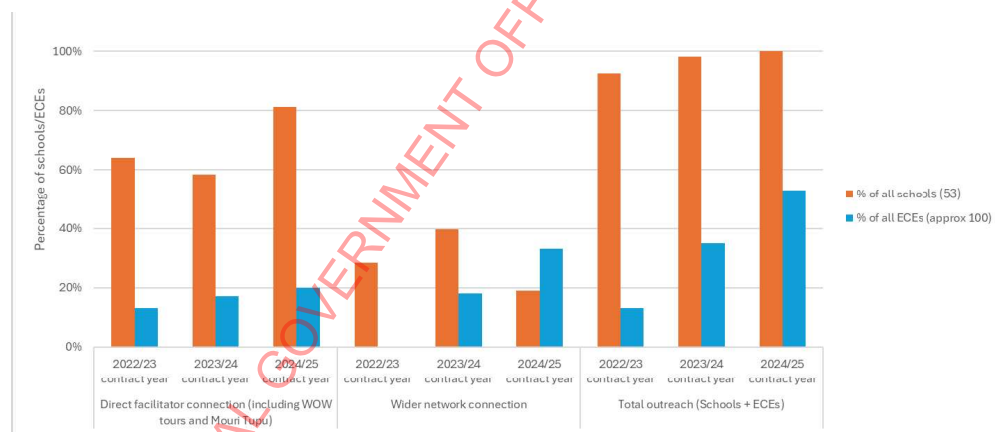
11. However, the landfill's remaining life can lengthen or shorten, depending on the amount of waste received and this can be driven by a range of factors. For example, [Spicer landfill in Porirua may close by 2035](#), and possibly as early as 2030, which is likely to result in a step-change increase in the amount of waste received at Silverstream instead.
12. To protect and extend the lifespan of Silverstream Landfill, it is important to increase recovery of resources, particularly organic waste and construction and demolition waste, advocate for effective policy changes (eg increased producer responsibility), and support local businesses and communities to move towards a more circular economy. At the same time, safe residual waste disposal and treatment options will continue to play a role in managing materials that cannot be avoided, reused, recycled, or recovered.
13. Looking at our household waste behaviour in Lower Hutt shows that more tools are needed to decrease the amount of kerbside waste heading to landfill, as kerbside waste is still increasing (see graph below), and this is in part due to the lack of diversion options. For example, as noted in the report presented to the [Long-Term Planning Subcommittee \(LTPAP2025/1/36\)](#) in February 2025, on average and by weight, over 50% of the refuse bin content surveyed consists of food and green organic waste.



14. As noted in the dashboard in Appendix 1 attached to the report, Council is leading on a regional project under the WMMP to undertake an options analysis of future residual waste disposal options from 2035 onwards. This project is currently at the data collection and analysis stage.
15. This is a complex project that requires considerable data collection and analysis to support high level modelling and estimates on waste volumes and regional landfill capacity. The project report (once completed) would also likely operate as a living document that requires review and updating as the waste, resource recovery and disposal technology landscape changes over the next decade.
16. It is worth noting that this is not a decision-making project that would commit Councils to any option, but rather is intended to get a better understanding of what the challenges and opportunities are for the future of waste in the region.

Enviroschools

17. Enviroschools is a nationwide programme supported by the Toimata Foundation and a large network of regional partners. Schools and early childhood centres (ECEs) commit to a sustainability journey, where tamariki/students connect with the environment, then act locally to achieve sustainability-related outcomes in association with their communities.
18. There are currently over 1,652 enviroschools throughout Aotearoa New Zealand, involving over 400,000 tamariki/students and 20,000 teachers and/or staff. Significantly, over 80% of regional and local councils are delivery partners for the Enviroschools programme.
19. Council signed a three-year contract with Toimata Foundation in 2022 to deliver an expanded Enviroschools programme, including the World of Waste (WoW) tours to tamariki/students in Lower Hutt. The aim of the contract was to have some form of Enviroschools engagement with all schools and ECEs in Lower Hutt.
20. The figure below provides data on the increasing level of outreach to schools and ECEs achieved during the three years of the contract. Direct facilitator connection refers to a situation where the school or ECE has committed to either the full or partial Enviroschools programme. A network connection means the school or ECE has opted to be part of the Enviroschools network, participating in events and using resources where appropriate, but not committing to the full programme.



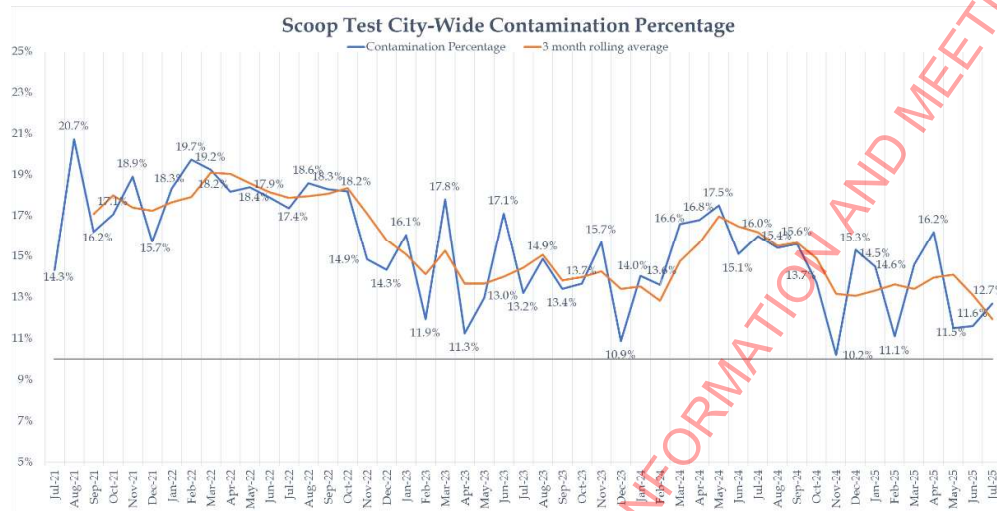
21. Due to central government funding changes, the Toimata Foundation is no longer able to hold contracts for the Enviroschools Programme in the Wellington Region. Still, it will continue to provide national-level support and administration for the Programme. As such, the eight local councils from the Wellington region and the Greater Wellington Regional Council met on 7 August 2025 to discuss short- and long-term options for the delivery of the Enviroschools programme in the region. Officers will report back on the outcome of this process.

Construction and Demolition Waste Diversion Pilot Project

22. Construction and Demolition waste (C&D waste) is a significant waste stream at landfills in the Wellington Region. It has negative implications for landfill airspace, carbon emissions and the promotion of a circular economy.
23. For Silverstream Landfill, the best available data is from a Solid Waste Analysis Protocol (SWAP) undertaken in early 2022. The SWAP found that approximately 21% of the loads surveyed and 10% of the loads by weight (equivalent to 243 tonnes per week) from both the transfer station and the tip face combined originated from construction or demolition activities.
24. The resource recovery team have been exploring options for C&D waste diversion in the Wellington region. To date, the availability of viable diversion pathways has been limited by inadequate processing infrastructure and restricted access to end markets.
25. The Commercial C&D Waste Solution Pilot Project (Pilot) has been established to pilot an interim pathway to divert C&D waste from Silverstream Landfill whilst more permanent C&D waste infrastructure is developed in the Wellington region.
26. The Pilot involves the transportation of C&D waste from the landfill to the resource recovery company Central Environmental in the Manawātū District.
27. An external supplier will supply the C&D waste and transport it to Silverstream Landfill, where it will be temporarily stockpiled and compacted before transportation by Central Environmental to their plant outside Fielding.
28. Central Environmental will then process the items/materials and either return the outputs to their original manufacturer or to other consignees for reuse and/or recycling.
29. The pilot will involve about ten hook bins (30 cubic metres) of C&D waste, and is expected to have the following benefits:
 - a. Testing the logistics that underpin the pathway from the Silverstream Landfill to Central Environmental in Fielding.
 - b. Establishment and fostering of relationships with industry partners that may assist with post-project efforts to divert C&D waste.
 - c. An understanding of whether diverting small-scale tonnages of C&D waste from the Silverstream Landfill can be scaled up to medium-to-large scale tonnages.
30. Work is underway with Tonkin + Taylor to prepare a site at Silverstream Landfill for the project, and officers expect to begin transporting C&D waste to Central Environment in the next few months.

Kerbside recycling contamination

31. Contamination has reached a new low, based on three-monthly average dropping to 11.9%, with monthly results of 11.5%, 11.6% and 12.7% for May, June and July 2025 respectively.



32. As part of our comprehensive programme to reduce contamination, work is currently focused on designing the next phase of targeted behaviour change. This will involve refreshing assets from previous campaigns and addressing problem items such as soft plastic and food waste, as well as getting practical communications into our communities.

Kerbside service electrification

33. Over the next six months, eight more large EV side-load trucks will join the fleet servicing Lower Hutt residents, replacing the current diesel trucks. It is likely that some of these new trucks will also utilise the new Heavy EV Charging Hub at Silverstream landfill.
34. Note that one of the new trucks will be on display at the *Electrify the Hutt* expo on 4 October 2025.

Climate Change Impact and Considerations

35. The matters addressed in this report have been considered in accordance with the process set out in Council's Climate Change Considerations Guide.
36. Minimising waste, diverting recyclables from landfill, and recovering reusable materials (such as the potential addition of C&D diversion opportunities, diverting biosolids, etc.) contribute to a more circular economy. These activities reduce the need to extract further resources from the environment and the associated energy use.

Consultation

37. Not applicable

Legal Considerations

38. Not applicable

Financial Considerations

39. There are no current financial considerations.

Appendices

No.	Title	Page
1↓	Appendix 1 - LAP Project Dashboard	53

Author: Jessica Hayman
Senior Advisor Waste - Planning and Strategy

Reviewed By: Jörn Scherzer
Head of Climate, Waste and Resource Recovery

Approved By: Alison Geddes
Director Environment and Sustainability

Appendix 1. Summary of WMMP Local Action Plan Programme Dashboard

There are currently 18 projects actively underway to meet the actions outlined in the WMMP (2023-2029), and six that have been started but are on hold due to team capacity or external uncertainty outlined in the programme summary below. Note that projects that have been reported as completed in a previous dashboard are not included. Also not included are projects that are not due to start within the next 12 months (eg bylaw review).

Name	LAP Action	Regional/Local?	Stage	Project Description	Project type	Subject matter	Reach/Community impact	Project impact	Project update
Bylaw Implementation (C&D waste)	Action 9	Local Project	In progress	Implementation of the bylaw requirement to have waste management and minimisation plans for new developments over \$2M in value.	Operational	Compliance	Medium	High Weight	C&D bylaw implementation planning is continuing, with regular meetings with regional officers to ensure regional consistency. HCC has taken the lead role for this regional project, with the first step being working with stakeholders to create a template for waste minimisation plans that meet the bylaw provisions and planning for regional and local comms and engagement.
Kerbside - Contamination reduction	Action 19	Local Project	In progress	Officers are collaborating with a behaviour change agency to create a targeted campaign aimed at reducing contamination.	Comms/engagement	Kerbside	High	High Weight	Work with the behaviour change agency EightyOne continues to support targeted engagement and refreshed use of existing assets and graphics. Currently, this includes designing a FAQ asset for use by property managers, hubs and library staff and other points of contact in the community that households may turn to for advice or clarification.
FOGO kerbside collection and processing	Action 12	Sub-regional Project	In progress	Plan and implement a potential new kerbside FOGO service and identify a suitable processing solution.	Operational	Organics	High	High Weight	On 7 August 2025 Wellington City Council's Environment and Infrastructure Committee agreed to continue with the joint WCC/HCC procurement process for a regional FOGO processing solution. The final Stage 4 of the procurement process could commence in October 2025. The process will enable HCC to confirm the costs of the processing solution, and this will inform Hutt City Council's decision in 2026 on whether to implement the proposed service.
Future of residual waste	Action 11	Regional Project	Planning	Undertake an investigation to assess the regional flow of waste and the current and future infrastructure and services required to manage known and future residual waste streams (including disposal or alternatives). HCC leads this regional project.	Policy	Research	Low	High Weight	Data discussion meetings have been held with three of eight councils with the remainder scheduled over the next few weeks. Data collection and analysis will follow, aiming to have the initial findings by end of September.
Soil and aggregate recycling	Action 12	Local Project	In progress	Collaborate with partners to potentially develop a soil and aggregate recycling facility at Silverstream Landfill.	Operational	Contaminated Soil	Medium	High Weight	We continue to await their advice on next steps, noting there are concerns about progressing the project in the current uncertain economic climate. However, HCC has requested further information on expected soil volumes in relation to Te Wai Takamoni o Te Awa Kairangi – Riverlink, which may provide more certainty to Fulton Hogan for their investment decisions.
EDI soil remediation trial	Action 12	Sub-regional Project	On hold	The company EDI has proposed a trial of a technology to neutralise recalcitrant soils (eg contaminated with asbestos).	Operational	Contaminated Soil	Medium	High Weight	Following the withdrawal of UK Government funding for the trial, HCC investigated alternative funding options to enable the trial to still go ahead. A preferred option has been identified, with HCC co-funding the trial, albeit with decisions yet to be made. If approved, trial could commence as early as October 2025.
C&D commercial solution	Action 13	Sub-regional Project	In progress	Investigate and implement diversion pathways for commercial C&D waste.	Operational	C&D	Medium	Medium Weight	HCC is working with stakeholders to prepare Silverstream Landfill for a trial diversion pathway to a recovery facility in the Manawatu. This is an interim solution while the Porirua processing facility progresses under the subregional project. We are currently working with Tonkin + Taylor to prepare the site at Silverstream, and expect to begin transporting C&D waste to Central Environment in the next few months.
Minimising Event Waste	Action 2	Local Project	In progress	Establish and embed a process with internal and external stakeholders to minimise waste and litter at community events over 1000 attendees.	Operational	Events	Medium	Medium Weight	A trial with Nonstop Solutions to partner with event organisers to ensure best practice waste management and minimisation for community events has now come to a close. The team is working on options for continuing to support large events, as well as options for expanding support to minimise waste at smaller events.
Silverstream resource recovery improvements	Action 4	Local Project	In progress	Identify and implement transfer station and Zero Waste Hub improvements to increase diversion of recoverable materials.	Operational	Resource recovery	Medium	Medium Weight	In order to inform the addition of new waste streams for diversion (eg plate glass, native timber, tyres), an evaluation of the site was undertaken. More detailed design work on a changed layout is under way, to inform decisions on how the waste streams can be managed operationally.
Business waste audits	Action 4	Local Project	Not started	Offer and deliver audits to engaged businesses as part of business engagement plan	Comms/engagement	Business	Medium	Medium Weight	Not yet started.
Business engagement	Action 4	Regionally Coordinated	Not started	Develop a business engagement plan consistent with agreed regional approach.	Comms/engagement	Business	Medium	Medium Weight	Not yet started.
SR3 Contaminated soil	Action 12	Regional Project	On hold	Lead on regional project to investigate the quantum, source, degree of contamination, and fate of contaminated soil from around the region and identify opportunities to support diversion from landfill disposal.	Policy	Contaminated Soil	Low	Medium Weight	On hold due to team capacity constraints, planned to continue in early 2026.
Treated timber diversion research	Action 11	Local Project	On hold	Research diversion opportunities for treated (and untreated) timber.	Operational	Research	Low	Medium Weight	Trial continues to be on hold while discussions around regional and industry co-funding options are explored.
Tikanga Māori Initiative(s)	Action 1	Local Project	Planning	Provide support to local iwi groups and/or other organisations that provide tikanga Māori perspectives on waste minimisation initiatives.	Operational	Various	Medium	Medium Weight	The Resource Recovery team is actively working with the Council's Kahui Mana Whenua group to identify opportunities for partnership for Lower Hutt based Tikanga Māori initiatives related to circular economy.
Litter reduction campaign	Action 18	Local Project	In progress	Implement city-wide campaign on litter and illegal dumping.	Comms/engagement	Litter	Medium	Medium Weight	Work is underway by EightyOne to develop a behaviour change campaign focused on litter and illegal dumping. In parallel, officers have procured an organisation to plan and carry out additional events to support World Clean Up Day 2025 on 20 September 2025.

* Projects related to Actions 1 and 17 are delivered through contracts delivered by external providers and are treated as business as usual (EnviroSchools contract, Sustainable Coastlines contract).

** Project weight is calculated from a weighted formula that includes 'priority', 'diversion potential', 'reach', and 'budget'.

Appendix 1. Summary of WMMP Local Action Plan Programme Dashboard

There are currently 18 projects actively underway to meet the actions outlined in the WMMP (2023-2029), and six that have been started but are on hold due to team capacity or external uncertainty outlined in the programme summary below. Note that projects that have been reported as completed in a previous dashboard are not included. Also not included are projects that are not due to start within the next 12 months (eg bylaw review).

Organisational behaviour change	Action 2	Local Project	In progress	Implement waste minimisation initiatives internally (at Laing's road administrative building) and across council facilities.	Internal	Behaviour change	Low	Low Weight	Results from a waste audit at Laings Road admin building were analysed; work is under way to implement some changes (eg internal recycling infrastructure to be improved).
R3 Waste Forum	Action 6	Regional Project	In progress	Provide Secretary and Treasurer support for the Forum and maximise the effectiveness of the Waste Forum.	Comms/engagement	Events	Medium	Low Weight	HCC successfully delivered the Waste Forum event in July, with 85 attendees from other councils, industry, consultancies, and community groups.
Stormwater treatment trial	Action 18	Local Project	On hold	Trial a Downstream Defender unit to capture gross pollutants, litter, and fine contaminants in stormwater to provide baseline data for waste and pollutants entering waterways, and for a proof of concept to improve stormwater quality.	Operational	Litter	Medium	Low Weight	In light of the establishment of the new water agency in July 2026, there is significant uncertainty on implementation costs and how this project could be delivered in a timely manner, and whether the new agency has the ability to support it if a Downstream Defender was installed. In light of a lack of team capacity, the project has been put on hold and may be cancelled.
Site remediation	Action 21	Local Project	In progress	Identify and implement remediation options for closed landfills.	Operational	Research	Medium	Low Weight	A consent application is under development, for remediation work at the closed Eastbourne landfill (eg top up cap, repair drains, etc), engagement with GWRC is scheduled for September 2025.
Battery Recycling	Action 2	Local Project	In progress	Investigate options, and if viable implement, accessible battery collection for recycling on Lower Hutt residents.	Resource Recovery	Resource recovery	Medium	Low Weight	The rollout of battery recycling is scheduled to commence in September 2025. Deliveries and staff inductions are currently being coordinated, and final design work is underway to ensure the collection units align with the Too Good To Waste campaign.
Central government advocacy	Action 10	Local Project	In progress	Central government advocacy opportunities are approached from a regional perspective or local perspective, if and when appropriate.	Comms/engagement	Various	Low	Low Weight	No relevant advocacy undertaken since last update.
Embedding waste reduction in procurements	Action 3	Local Project	Not started	Create and implement a policy for reducing waste in contracts and services procured across HCC.	Internal	Waste minimisation	Low	Low Weight	Not yet started.
Additional zero waste hub	Action 12	Local Project	On hold	Investigate options for a potential additional Zero Waste Hub facility, including working with existing resource recovery partners to expand operations.	Operational	C&D	Medium	Low Weight	Scoping on this project is on hold due to team capacity.
CRD single-use transition engagement	Action 4	Local Project	On hold	Work to transition Lower Hutt CRD to a single-use free city, with a primary focus on eliminating disposable coffee cups and supporting reuse.	Comms/engagement	Waste minimisation	Medium	Low Weight	On hold due to team capacity.

* Projects related to Actions 1 and 17 are delivered through contracts delivered by external providers and are treated as business as usual (EnviroSchools contract, Sustainable Coastlines contract).

**Project weight is calculated from a weighted formula that includes 'priority', 'diversion potential', 'reach', and 'budget'.

Update on solid waste management and minimisation work streams

Briefing Note

Chief Executive

Director	Allison Geddes Director, Sustainability and Environment
Author	Jörn Scherzer Head of Climate, Waste & Resource Recovery
SUBJECT	REQUEST FOR APPROVAL TO SUPPORT EDL DEMONSTRATION AT SILVERSTREAM LANDFILL WITH WASTE LEVY FUNDING

Purpose

To recap on Environmental Decontamination Limited's (EDL) proposed asbestos treatment demonstration at Silverstream landfill, and to seek your approval to provide ring-fenced waste levy funding support of \$365,000.

Comment

EDL is a New Zealand owned and operated research & development company that has proposed to conduct a demonstration of an asbestos treatment technology at Silverstream landfill. The project would support Council's circular economy, climate change and economic growth aspirations.

In May 2024, a Memorandum of Understanding (MoU) was signed between EDL and Council to enable a 6 to 12-month practical demonstration of the technology to begin at the Silverstream Landfill in early to mid-2025.

The cost of the practical demonstration was to be jointly funded by EDL and the UK Government's Nuclear Decommissioning Authority. However, the Nuclear Decommissioning Authority withdrew funding as part of a suite of cost-cutting measures by the UK Government in early 2025. This withdrawal resulted in EDL suspending the practical demonstration until such time as the shortfall could be addressed.

Environmental Decontamination Limited's demonstration project could still go ahead with funding support from Hutt City Council (HCC). With that context in

mind, you were provided with their proposal, and a memorandum with an assessment on the potential benefits to Council and Lower Hutt. This also included information on how various risks can be managed, and the potential return on investment for Council should the demonstration result in a commercial plant at the site. An independent due-diligence report was also commissioned, which did not raise any concerns.

The full list of documents is as follows (these are also attached as appendices to this briefing note):

- Original MoU between HCC and EDL from May 2024
- EDL proposal from June 2025
- Memorandum from July 2025
- Due diligence report from Mark Abbot Consulting from June 2025
- Supplementary: funding breakdown and what HCC pays for, supplied in August 2025
- Supplementary: information on the potential return on investment to HCC

EDL executive officers also presented their proposal to you on 16 September 2025.

In order to enable decision making, key considerations are as follows:

Return on investment considerations: EDL has presented some options for how HCC could receive a return on its investment of \$365,000. While contingent on the establishment of a commercial plant in the event that the demonstration is successful, this could include repaying the upfront HCC contribution and/or delivering savings for Te Wai Takamori o Te Awa Kairangi (RiverLink) project and/or creating long-term revenue generation potential for HCC.

Procurement considerations: A tender exemption enabling EDL to be directly sourced has been endorsed by HCC's procurement team.

Financial considerations: HCC's funding support is from the use of waste levy funds, which is consistent with section 32 of the Waste Minimisation Act 2008 and Local Action #11 of Council's Waste management and Minimisation Plan 2023-29. The funding contribution amounts to approximately 15% of Council's annual waste levy share received from the Ministry for the Environment (\$2M+) and hence represents a relatively minor share of the overall ring-fenced

funding available. A staged approach would be utilised, with funding provided on delivery of milestones.

Legal considerations: The use of Silverstream Landfill for the practical demonstration is consistent with the Landfill's existing resource consent framework.

Health and safety: The MoU requires EDL to provide Council a comprehensive health and safety plan for approval to safeguard the ongoing health and safety of all parties associated with the practical demonstration.

Recommendation(s)

That you approve a waste levy funding contribution of \$365,000 to EDL to undertake a practical demonstration of their asbestos treatment technology at Silverstream Landfill.

Next steps

If you approve the funding contribution, the following steps will occur:

In collaboration with HCC's legal team, a formal contract between EDL and Council will be finalised to give effect to the funding contribution in tranches and in relation to key deliverables. The agreement will incorporate key expectations for EDL to demonstrate the steps they have undertaken to establish a commercial plant, for the event that the demonstration is successful.

Note that EDL have confirmed that once the first tranche of funding has been received, the demonstration plant and equipment will be transported, installed and commissioned at Silverstream Landfill.

Acceptance

s7(2)(a)

(signature)

Name: Alison Geddes

s7(2)(a)

(signature)

Name: Jo Miller

23/10/2025

s7(2)(a)

+ supportive

Position: Director Environment &
Sustainability

Position: Chief Executive

Date:

Date

Attachments

- Original MoU between HCC and EDL from May 2024
- EDL proposal from June 2025
- Memorandum from July 2025
- Due diligence report from Mark Abbot Consulting from June 2025
- Supplementary: funding breakdown and what HCC pays for, supplied in August 2025
- Supplementary: information on the potential return on investment to HCC

MEMORANDUM OF UNDERSTANDING



Executive Summary

1. This Memorandum of Understanding (MoU) formalises the arrangement between the Hutt City Council and Environmental Decontamination (NZ) Limited (EDL) with respect to a prospective trial at the Silverstream Landfill of EDL's novel waste treatment and remediation technology.

Introduction

2. The Hutt City Council is proactively seeking ways of reducing waste disposed of at the Silverstream Landfill – especially contaminated soil, which is a significant waste stream into the Landfill. EDL is seeking a suitable location to undertake a trial of their technology to process asbestos containing materials (ACMs) and remediate/decontaminate contaminated soil. The use of the Silverstream Landfill is an ideal location for the trial given the availability of land, contaminated soil, and proximity to an operational landfill. Furthermore, the Silverstream Landfill has resource consent to receive, handle, and dispose of the target materials.

Background

3. Environmental Decontamination (NZ) Limited ("EDL") is a New Zealand-based company committed to finding solutions to hazardous wastes, including ACMs, contaminated soils, and chemical stockpiles. The company has developed and patented a mechanochemical process that breaks the chemical bonds that are found in many recalcitrant contaminants that are commonly found in soils that have been impacted by industrial use. The same technology can also be used to transform carcinogenic ACMs into inert powders. The Hutt City Council ("the HCC") is the territorial authority responsible for the city of Lower Hutt. HCC is the owner of the Silverstream Landfill ("the Landfill") – a class 1 (municipal) landfill located at the northern extremity of the city's boundaries. The Landfill is the largest in the Wellington Region and receives approximately 150,000 tonnes of waste annually. A significant portion of the approximated 150,000 tonnes of waste disposed of at the Landfill annually is contaminated soil from infrastructure projects from within the Wellington Region and beyond. This portion has increased exponentially over the last 24 months resulting in consequential landfill pressures that could prematurely suspend landfill operations. Silverstream Landfill also receives significant volumes of ACMs which could be diverted from the landfill, provided a technological solution can be developed.

Nature of Trial

4. The 6-to-12-month trial involves the installation of a modified 20-foot container that accommodates EDL's trial technology – i.e. plant and other equipment etc. on a yet-to-be determined site within the Landfill precinct. The technology uses mechanochemical means to physically break the molecular bonds that hold contaminant particles together. The trial will focus on ACMs, soil containing asbestos, POPs, and PFAS but other contaminants may also be investigated during the trial. It is envisaged that the tasks and operations that underpin the trial will be undertaken directly by EDL employees, but this does not preclude the use of sub-contractors as and when required.

Proposed Operation

Set-Up Process:

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5. The steps required for set-up include:



Note: The HCC and WMNZ would need to review and approve any EDL Health & Safety and Environmental Plans prior to the commencement of any trial – for e.g. details on how EDL intend to manage airborne asbestos fibres etc.

Operational Process:

6. The daily/weekly/monthly tasks include:



Site Location

7. Selection of a suitable site for the modified 20-foot container within the Landfill precinct will be by mutual agreement between the HCC, EDL, Waste Management (New Zealand) Ltd, Leach & Co Ltd and LMS Energy. Waste Management (New Zealand) Ltd ("WMNZ") is the HCC contractor responsible for the day-to-day landfill operation. Leach & Co ("LC") is the HCC contractor responsible for the installation and maintenance of landfill infrastructure, for e.g. roading, landfill lining, earthworks etc. LMS Energy ("LMS") is the HCC contractor responsible for the landfill gas extraction infrastructure and associated power plant. Liaison with LMS is only required if the potential site is proximate to any gas extraction infrastructure. The main factors likely to impact site selection include:

- Accessibility for installation of container and delivery/removal of soils
- Practicality in terms of landfill and EDL operations
- Non-interference with planned and current landfill infrastructure.

Power Supply

8. The only areas in the Landfill precinct that have power are the kiosk/weighbridge and the landfill administrative buildings. These areas are located near the entrance to the Landfill and would not be suitable for EDL's modified 20-foot container. EDL would therefore need an external petrol or diesel generator(s) if power is required at the container. The sourcing, storage and upkeep of the generator(s) will be the responsibility of EDL. As subsequently noted in the MoU, cell phone coverage beyond the kiosk and administration building is haphazard.

Health & Safety

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9. The Landfill is an inherently dangerous place. All EDL employees and sub-contractors involved in the trial will need to undergo full induction with WMNZ and then comply with all health and safety regulations and directives issued by them (including attendance at compulsory meetings and adherence to their Covid 19 vaccination policies). EDL is expected to provide their own health and safety policies, practices, and procedures specific for the tasks and operations associated with the trial. Any EDL health and safety plans for the trial as per paragraph 5 will need to assess the known risks and hazards for the duration of the trial. The hazards must also have controls in place based on the General Workplace Regulations 2016 and acknowledge (but not be limited to) the following aspects of the trial:

- Physical controls: what signage and/or other physical controls such as electrical isolation devices, gates and/or fences etc. are required for the site.
- Training: for EDL employees or subcontractors: what specific training requirements are required to ensure that all tasks and operations associated with the trial are undertaken safely and efficiently.
- PPE requirements: what personal protective equipment (PPE) is required whilst onsite and how will any specific health and medical conditions be addressed during the trial.
- Induction: along with the WMNZ inductions, what are EDL's induction processes for sub-contractors or visitors to the site.
- Responsibilities: what are EDL's responsibilities for any sub-contractors or visitors to the site and how will they fulfil their own health and safety obligations and those of WMNZ, for example, emergency evacuation of the site, reporting a hazard to WMNZ etc.

Access to Site

10. The main access to the Landfill is via Reynolds Bach Drive. Most areas within the Landfill precinct can then be accessed by internal roading networks. An arrangement will be made between EDL and WMNZ to enable unrestricted access for EDL staff during the Landfill's standard hours of operation¹ to enter the Landfill and transit to the site. Most of the internal roading is gravel and undulating – and therefore access can be difficult in wet weather. As such, it is recommended that EDL use a 4WD vehicle for the trial to ensure access to the site in all weather conditions. A separate arrangement will have to be made with WMNZ if afterhours access to the site is required by EDL.

Obtaining ACMs, Contaminated Soil and Other Target Materials

11. The nature of the trial means that EDL will need access to various waste materials e.g., ACMs, soils. Requests for particular types of contaminated soil, for example soil contaminated with Asbestos, should be directed ahead of time to the HCC. In particular, the requests should include:
- Type of material needed.
 - The type of contamination required.
 - How much material is required and how it should be delivered.
 - When the material needs to be delivered.

¹ 7.30 am to 5.00 pm Monday to Saturday; 8.30 am to 4.30 pm on Sundays and Public Holidays.

The HCC will then liaise with WMNZ and Tonkin + Taylor ("T + T"), whom are the HCC's contractors for overseeing the Landfill and providing engineering and environmental services, to fulfil the request. However, direct engagement between EDL and WMNZ and T + T can take place if such an approach is more practical and there is no need for the HCC to coordinate actions. The same or similar process is expected for contaminated soils that have been processed by EDL and need to be deposited back to the Landfill. The above process in which contaminated soil is procured from the Landfill is based on the proviso that EDL will require soils approximately once a month. A more detailed process including cost-recovery provisions will be required if deliveries and removals of contaminated soil are expected to be weekly. As the Landfill receives applications for the disposal of contaminated soil on a case-by-case basis, particular types of soil may not be available at the Landfill when requested or there may be no pending applications for that type of soil. The Ministry for the Environment has strict rules around recording volumes of waste entering the Landfill. To enable HCC to comply with these rules, EDL will need to retain detailed chain of custody documentation recording volumes of contaminated soil processed, the source of that soil and the fate at the end of the process. Any contaminated soil entering the landfill permanently must have been weighed on the weighbridge at the kiosk either before or after processing by EDL.

Landfill Operations

12. The Landfill is an important part of Lower Hutt and the Wellington Region's infrastructure and operations run continuously throughout the day, 364 days a year. It is extremely important that disruptions to daily operations involving WMNZ, other contractors and landfill users are minimised. To that end, all EDL staff involved in the trial must follow all relevant and applicable landfill standard operating procedures (SOPs) from either the HCC or contractors and not interfere with daily operations unless strictly necessary. This includes complying with all traffic management plans, odour control plans, bird/wildlife management plans, dust suppression procedures etc. Discussions with T + T, WMNZ and L&C closer to the trial start date will identify which SOPs are likely to apply to the trial and associated activities.

Resource Consent

13. The Landfill is consented to undertake the full breadth of landfill operations. Part of the Resource Consent is to manage discharges in the most effective and environmentally friendly way. EDL will need to contact T + T if they expect or happen to be in a position where any land, air or liquid discharge is required to ensure that any such discharge occurs in a compliant manner or that additional consents are obtained from the applicable consenting agency.

Container Movements

14. It is expected that once the modified 20-foot container and associated plant and/or equipment, for e.g. the power generator, has been installed at the selected site, there will be no further movement during the trial. However, if the preferred site is no longer suitable for whatever reason after the commencement of the trial, EDL will need to reach out to the HCC and an alternative site in the Landfill precinct will need to be found.

Security

15. The kiosk and administration building(s) are the only areas in the Landfill that are covered by CCTV and are alarmed (alarm is monitored). Vehicle access to the Landfill is controlled by a gate prior to the kiosk. EDL would need to invest in their own security systems if additional security is required at the site. Reliable cell phone coverage and ethernet internet connectivity are limited to the kiosk and the administration building.

Costs

16. Both EDL and the HCC will bear their own expenses in relation to the trial. For clarification, the HCC are not seeking rent or leasing expenses from EDL. For EDL, these costs include (but are not limited to):

- Vehicle(s).
- The Outline Plan to ensure congruency with Landfill's Resource Consent
- Obtaining any discharge consents (if required).
- Provision of the modified 20-foot container and trial plant/equipment.
- Transport of the container and trial plant/equipment to and from the site (includes PPE).
- Site preparation above and beyond a flat, gravel area.
- Signage and other physical controls (if required).
- Power generator(s) and relevant connections.
- Plant/equipment set-up and commissioning.
- Security above and beyond current arrangements.
- Contaminated soil delivery and removal if more than once a calendar month.
- Contaminated soil delivery if sourced from applicant (refer to paragraph 11).
- Plant/equipment/waste removal and disposal (if required)
- Site remediation (if required)

For HCC, these costs include (but are not limited to):

- Project management, coordination and administration costs

Facilities/ Amenities

17. WMNZ will make available the use of the administration building which includes a meal room with standard kitchen facilities, toilets and showers for use by EDL employees when required. EDL may choose to install their own "portaloos" and/or portable meal room closer to trial plant/equipment.

Intellectual Property / Confidentiality

18. All Intellectual Property (IP) owned prior to the trial and developed by EDL during the trial will remain the property of EDL. However, EDL may decide to share the results of the trial with the HCC.

19. In relation to EDL's plant and equipment, HCC agrees:

- i. Not to copy, reverse engineer or manufacture the equipment of EDL.
- ii. Not allow any third party to carry out the actions in clause (i) above.
- iii. To allow the trade secret, operating know-how and Intellectual Property associated with EDL equipment to be known only by those employees of HCC involved with the anticipated project.

20. Each party (Receiving Party) must always keep confidential and secure, and not exploit or otherwise misuse, all Confidential Information of the other party (Disclosing Party). The Receiving Party may only disclose and use Confidential Information of the Disclosing Party to the extent:

- i. Necessary to perform this Agreement and on a "need-to-know" basis only.
- ii. Authorised in writing by the Disclosing Party.
- iii. Required by law; or
- iv. The information is, or becomes, public with the authority of the Disclosing Party and without breach by the Receiving Party of these provisions or any other confidentiality obligation.

Termination of MoU

21. Both the HCC and EDL may withdraw from this MoU at any time before or during the trial. Any disagreements should be settled in good faith to the mutual satisfaction of the involved parties, but where this has not been achieved after repeated attempts, the HCC disputes resolution policy/process will apply. If EDL decide to withdraw from the trial before the designated end date, they will have up to 21 days to remove the modified container and all other plant/equipment and waste items/materials from the site.

Contacts

22. The following contacts apply:

Andred Saker s7(2)(a)	Senior Advisor, HCC Director & Chief Scientist, EDL	s7(2)(a)
	Landfill Manager, WMNZ Principal Environmental Engineer, T + T Leach and Co	

Appendices

23. The following appendices are attached to this MoU:

- Aerial view of Silverstream Landfill
- Hutt City Council disputes resolution policy

Confirmation

Signed..... s7(2)(a) Date..... 23/5/24
Geoff Roberts (on behalf of Hutt City Council)
 Manager, Waste and Resource Recovery

Signed..... s7(2)(a) Date..... 24/05/2024
 s7(2)(a) (on behalf of Environmental Decontamination (NZ) Ltd)
 Director & Chief Scientist

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Proposal for Asbestos Destruction Pilot Trial

Prepared by: Environmental Decontamination (NZ) Limited
For consideration: Hutt City Council
Date: 27th June 2025

Environmental Decontamination (NZ) Limited

E s7(2)(a) @edl-tech.com

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1. Executive Summary

Environmental Decontamination (NZ) Limited (EDL®) is a New Zealand-based company that has developed proprietary its mechanochemical destruction (MCD®) technology designed to treat recalcitrant contaminants that pose significant risks to human health and the environment. This innovative technology is both registered and patented across multiple global jurisdictions, including Asia, Africa, the Americas, Europe, and Australasia.

With established expertise, infrastructure, and operational capacity, EDL is well positioned to design, construct, and implement viable MCD systems to support the proposed asbestos destruction pilot trial. The research programme will be conducted at the Silverstream Landfill, where EDL can draw on a team of onsite MCD specialists, including scientists, engineers, and project managers, as well as a range of fit-for-purpose plant and equipment. EDL's unique expertise and technological solutions ensures the delivery of outcomes that align with council objectives, environmental standards, and broader urban sustainability goals.

Through deployment of EDL's pilot-scale MCD system, the project aims to demonstrate a scalable and effective solution for the destruction of asbestos and asbestos-containing materials (ACM). It is anticipated that the trial will validate the technology's ability to operate at throughput rates appropriate for landfills such as Silverstream, laying the foundation for future commercial-scale applications.

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2. Overview of the Asbestos Problem

Environmental Decontamination (NZ) Limited (EDL) is an innovation-driven company that continues to pioneer the large-scale treatment of asbestos and asbestos-containing materials (ACMs) using our patented mechanochemical destruction (MCD) systems. Refer to Section 3 Technology Description for a detailed breakdown of the underlying treatment process. At EDL, we are focused on achieving the best possible results for human health and the environment, while utilising cutting-edge scientific concepts to address the complexities and challenges associated with ACM degradation.

For decades, asbestos was widely used across industrial, commercial, and consumer sectors due to its exceptional physical and chemical properties, including heat resistance, high tensile strength, flexibility, and chemical inertness. In the construction industry, ACMs were especially valued for their superior thermal and electrical insulation properties.

However, despite its utility, the health risks associated with asbestos exposure became increasingly evident by the 1970s. Research into occupational exposure revealed that inhaling asbestos fibres could cause severe respiratory diseases, including mesothelioma, asbestosis, and lung cancer. This prompted regulatory action, with restrictions beginning in the 1980s and most developed nations banning asbestos use by the 1990s, except in specific, unavoidable circumstances such as power stations.

Despite strict regulation associated with the use, removal, and disposal of ACMs, approximately 100,000 people are estimated to die annually from diseases related to asbestos exposure globally. This is due to the presence of asbestos in the existing building stock globally. In other words, any building built before the 1990s is likely to contain asbestos in one form or another (e.g., cladding, insulation, roof tiles, pipes). Buildings consisting of ACMs pose significant risk due to aging infrastructure from ongoing weathering, in addition to the clear risks associated with demolishing or decommissioning, as well as ongoing risk associated with subsequent disposal / treatment.



Figure 1. Closeup of raw chrysotile asbestos.

One of the long-term ramifications of ACM disposal at landfill or storage facilities is the creation of legacy issues that need to be dealt with in the future, rather than suitably treating the immediate problematic asbestos waste with practical, efficient, and sustainable technologies. Diversion of ACM away from landfill presents a unique opportunity to treat and even repurpose asbestos waste streams. EDL has demonstrated the effectiveness and adaptability of the MCD technology to treat a range of contaminants on a large-scale over the last 20 years. Major projects include the treatment of ACM, obsolete pesticides, banned chemical stockpiles, and highly contaminated soil.

EDL are seeking to develop a technical and commercial case for our Mechanochemical Destruction (MCD) technology to treat asbestos and ACM materials typically disposed of at landfills. EDL's inhouse expertise and knowledge will be directly leveraged for this asbestos destruction pilot trial, forming part of the overall capability to establish a new technological approach for treating asbestos and ACMs derived from demolition waste, currently disposed of at landfill facilities.

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3. Technology Description

EDL is a New Zealand based company that has developed the MCD technology for the treatment of recalcitrant contaminants which pose a threat to human health and the environment. This technology has been registered and patented in Asia, Africa, America, Europe, and Australasia.

EDL has substantial infield experience, which includes large scale clean-up of soils contaminated with persistent organic pollutants (POPs). Over the past 20+ years, the MCD process has demonstrated its effectiveness and adaptability by destroying a range of contaminants on a large-scale, including ACM, obsolete pesticides, and contaminated soil. Initial pilot and full-scale projects focused on using MCD to degrade organic contaminants in soil, with more recent trials investigating asbestos and emerging organic contaminants.

3.1 Fundamentals of the MCD Treatment Process

MCD, or high energy ball milling (HEBM), has recently gained traction in the waste management sector due to its ability to effectively destroy asbestos fibres with no requisite for toxic solvents, extreme temperatures, harmful additives, or high pressures, which collectively make processing more expensive and complex. To provide a holistic understanding, the fundamental theoretical principles of MCD are discussed below, thereby explicating the rationale behind utilising HEBM as an ACM treatment technology.

Mechanochemistry is an established scientific field which explores the physical and chemical transformation of substances that have been mechanically stressed. The mechanisms involved in mechanochemical transformations tend to be complex and dissimilar to reactions observed in other remediation processes (e.g., thermal, photochemical, chemical oxidation).

MCD provides the immense, indiscriminate mechanical force required to drive chemical reactions, resulting in deformations and an array of intramolecular and intermolecular alterations. The ball-to-ball and ball-to-surface collision points are the major regions of chemical reaction initiation. The reactions induced at the collision point include material fracture, radical formation, electron transfer, and electron sharing which can result in the formation and, in the case of the proposed study, the amorphisation of strong crystalline structures.

While heat is generated under ball milling conditions, it was ruled out in early mechanochemistry research as the primary reaction initiation mechanism due to the abundance of empirical evidence showing the progression of mechanochemical reactions at incredibly low temperatures (e.g., 77 K). Rather, the formation of surface radicals and matrix defects by strong mechanical activation (e.g., grinding, ball milling) are the main reaction initiators and propagators.

For asbestos and ACM subjected to MCD conditions, mechanical activation leads to material fracture and the creation of highly reactive surfaces, with the end-product being an inert powder that is amenable to reuse for construction applications. Several international research groups have published MCD research related to the degradation of asbestos and ACM by HEBM. A summary of literature research findings is attached as Appendix A.

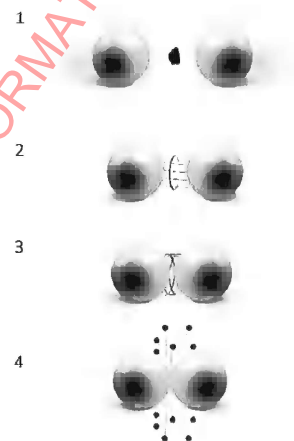


Figure 2. MCD Collision Profile: 1) High Velocity Impact; 2) Elastic Deformations; 3) Plastic Deformations; 4) Fracture.

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3.2 Preliminary Pilot-Scale MCD Trials (2015 & 2016)

Using the MCD technology, initial pilot-scale ACM amorphisation trials were conducted in 2015 and 2016. The work was carried out by EDL at an existing landfill site operated by EnviroServ Waste Management (EnviroServ) in Johannesburg, South Africa. This site was selected for logistical purposes, as it was already an excellent source for a variety of ACMs.

These initial pilot scale trials can be divided into three discrete investigations, based on their overall objectives and reactor development:

- 2015 Pre-Trial - preliminary investigation carried out by EDL and EnviroServ.
- 2015 Trial - EDL explored the scalability potential of the MCD technology to treat ACM; in other words, can we replicate degradation results observed in the laboratory trials as described in the literature.
- 2016 Trial - EDL used the results and outcomes from the 2015 trial to further develop the testing methodology and enhance the reactor system.

Tauw Group BV Netherlands (Tauw) collaborated with EDL as an external consultant during the 2015 and 2016 trials, to determine whether the MCD process is an appropriate technology for the treatment of asbestos and ACM. As an experienced consultancy firm and specialists in waste management, Tauw were able to provide an onsite specialist technician to independently verify and validate the MCD process and carry out an appropriate sampling procedure.

The conclusive outcomes of the 2015 and 2016 pilot trials reveal rapid neutralisation and destruction of fibrous asbestos in cement-bound materials can be achieved using EDL's MCD technology. A complete breakdown of these initial pilot trials is provided in Appendix B.

3.3 Technology Maturity

The proposed technological solution for the effective treatment of ACM has achieved the requisite maturity, or technology readiness level, for demonstration. Evidence to support this postulation is two-fold: (1) based on positive results from previous fundamental and applied research at benchtop scale; and (2) previous demonstrated capability of EDL's MCD technology to destroy ACM and other types of recalcitrant organic pollutants at pilot- and full-scale.



Figure 3. Past MCD works. A) MCD setup in San Francisco, USA (2008). B) Full-scale operation Mapua, New Zealand (2004). C) MCD setup at a former military airbase in Bien Hao, Vietnam (2012).

In addition to the progression of laboratory research activities, the MCD technology has been effectively deployed at pilot, demonstration, and full-scale for a range of hazardous waste streams over the last 20 years, typically targeting soil contaminated with POPs (e.g., polychlorinated biphenyls, obsolete pesticides, polychlorinated dibenzodioxins). Permanent and mobile MCD systems are shown above.

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Ongoing R&D over this time has led to the development of several generations of vibratory and stirred ball mills, with the latest 5th generation of the MCD system proposed for use in the ACM treatment pilot project.

The maturity of the MCD technology as essentially field-ready systems is well-established, in addition to the verification of concepts which underpin ball milling asbestos as a destructive treatment technique. Therefore, EDL has existing capability and capacity to readily design, prepare, and institute viable MCD systems for the proposed pilot trial. The proposed research programme will take place at the Silverstream Landfill, where the project will benefit from onsite MCD specialists (e.g., scientists, engineers, project managers) and access to a variety of necessary equipment. Following the successful outcomes of the proposed works, it is envisaged that the MCD technology will be one of a handful of validated field-ready techniques capable of effectively treating asbestos and ACM.

3.4 Third-Party Technology Validation

EDL is actively undertaking, and has previously delivered, a wide range of development projects across bench-scale, pilot-scale, and full-scale levels to address complex waste streams. These projects demonstrate the progressive validation of our technologies under varying conditions and scales, typically validated or assessed by third parties (e.g., governmental agencies, independent experts, large international consultancies). A breakdown of select technology assessments and validated projects is provided below.

3.4.1 Select Past Projects

Bureau KLB - Asbestos Treatment Technologies

A thorough evaluation, including a technology readiness assessment of the MCD technology, was undertaken as part of a Dutch Government-commissioned technology review entitled *"On the lookout for practical sustainable options for asbestos waste treatment"*, performed by Bureau KLB in 2018. The focus of the review was the recycling or treatment of non-radioactive ACM derived from demolition activities.

The KLB review included four comprehensive assessment parameters: technology readiness level, distance to market, sustainability aspects, area of application.

The KLB review concluded that the MCD technology has a TRL of 8-9 for asbestos and ACM. KLB also stated that the distance to market of the MCD technology was relatively small: *"the technique is proven on a pilot/semi-industrial scale and has also proved to be effective for other (organic) contaminants. While the pretreatment demands are strict (dimensions of crushed ACM and moisture content) ...the installation has a short construction time."* It is envisaged that the operation of the MCD technology for asbestos and ACM would lead to a positive business case.

Significant sustainability aspects were also defined in the KLB report, which inherently results in positive impacts for the treatment of asbestos and ACM: (1) simplicity and robustness of the process; (2) complete fibre destruction; (3) reusability of the end-product; (4) relatively low energy consumption for the treatment process; (5) relatively simple environmental control techniques; and (6) modularity/mobility of the installation.

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United Nations Development Programme - Dioxin Treatment Trial in Vietnam

In 2012, EDL successfully completed a United Nations Development Programme (UNDP)-funded technology demonstration at the Bien Hoa airbase in Vietnam, one of the country's most heavily dioxin-contaminated sites linked to historical Agent Orange use. The trial involved the mechanochemical treatment of approximately 100 tonnes of highly contaminated soil, with an average concentration of polychlorinated dibenzo-p-dioxins (PCDDs) measured at 30,000 ppt TEQ, and a range spanning from 5,000 to 120,000 ppt TEQ. The independent evaluation report, attached, confirmed the effectiveness of EDL's proprietary MCD® technology in achieving significant contaminant reduction and recommended the approach for broader deployment in remediating dioxin-contaminated soils and other persistent organic pollutant (POP)-impacted materials globally. The successful outcomes of this project were later acknowledged in the USAID-commissioned Environmental Assessment for Bien Hoa, dated 3 May 2016, further reinforcing the international recognition of EDL's capability to address complex legacy contamination through innovative, non-combustion treatment technologies.

US EPA Interim Guidance Report on the Destruction and Disposal of PFAS

The US Environmental Protection Agency released its 2024 update on the Destruction and Disposal of PFAS, a key federal guidance document that reviews the state of science and technology for managing these highly persistent contaminants. Among the evaluated technologies, the report includes ball milling as a promising emerging method for PFAS destruction. Notably, EPA scientists partnered with EDL to conduct a case study investigating the mechanochemical degradation of PFAS using EDL's proprietary ball milling technology. This collaboration provided direct experimental data and validated performance insights, contributing to the broader scientific understanding of PFAS treatment methods. EDL's involvement in this official US federal publication affirms the credibility, relevance, and international recognition of its mechanochemical expertise in tackling complex environmental contaminants.

CONCAWE Report: PFAS Soil Treatment Processes - A Review of Operating Ranges and Constraints

EDL contributed to the EU-Commissioned CONCAWE report in 2024, showcasing its pioneering application of ball milling technology in the effective destruction of PFAS, alongside other POPs. This contribution underscored EDL's role in advancing sustainable solutions for environmental challenges posed by these hazardous substances, highlighting the efficacy and versatility of mechanochemical processes in waste treatment and remediation strategies.

3.4.2 Select Current Projects

US DoD Scaling up PFAS Destruction in Soil using MCD

EDL is currently executing a 2.5-year research and development programme fully funded by the United States Department of Defense (US DoD) through its Environmental Security Technology Certification Program (ESTCP). The primary objective of this project is to demonstrate the scalability and field applicability of EDL's proprietary MCD technology for the destructive treatment of PFAS in highly contaminated soils.

This R&D programme includes a comprehensive feasibility study encompassing both technical and commercial aspects, with the aim of validating the mechanochemical process under

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conditions representative of large-scale remediation. This effort also involves detailed process optimisation to enhance treatment efficiency and cost-effectiveness, generating critical data to support future implementation of MCD in full-scale remediation projects across US DoD sites. The project reflects the growing recognition of MCD as a viable and sustainable non-thermal solution for addressing persistent PFAS contamination in complex environmental matrices.

MPI Mussel Shell Valorisation

Since 2021, EDL has been advancing a waste-to-value initiative aimed at transforming waste mussel shells into high-purity ground calcium carbonate (GCC) through our proprietary MCD technology. This high-efficiency grinding process enables the conversion of hard mineral wastes into micron-scale powders suitable for commercial use. Co-funded by the Ministry for Primary Industries (MPI), the project supports New Zealand's circular economy goals by offering a sustainable alternative to landfill disposal and creating a renewable, non-mined material. The successful completion of Phase 1 provided clear proof-of-concept, confirming the technical viability of producing GCC from mussel shell waste.

The project has since progressed to Phase 2, also supported by MPI through the Sustainable Food and Fibre Futures (SFFF) fund. This phase focuses on refining the full end-to-end process, including optimisation of the MCD grinding process, evaluation of supporting systems, product performance testing, and market viability studies. Detailed engineering design is also underway to support the development of a commercial-scale processing facility. Successful delivery of Phase 2 will pave the way for plant deployment at an appropriate location and set the foundation for market acceptance of this sustainable waste solution.

3.5 Industry Recognition

WasteMINZ Award for Excellence 2025

EDL was awarded the WasteMINZ Award for Excellence 2025 in the category of Most Sustainable / Innovative Waste Disposal Initiative for our pioneering work in harnessing the potential of mechanochemistry to address complex waste challenges. Our approach offers a safe, efficient, and sustainable solution for treating hazardous materials—eliminating persistent pollutants and converting waste into valuable resources. By applying advanced mechanochemical processes, EDL delivers scalable and cost-effective alternatives to traditional disposal methods, significantly reducing environmental impact while promoting circular economy outcomes.

Royal Society of Chemistry, Award for Best Paper 2023

EDL was received the Royal Society of Chemistry's Outstanding Paper Award for 2023 in Environmental Science: Advances. Our research article was recognised for its innovative use of ball milling to address PFAS contamination in soil and AFFF concentrates. Collaborating with experts from the University of Auckland and the USEPA PFAS Innovative Treatment Team, including Prof Jon Sperry, Dr Cameron Weber, Dr Erin Shields, and Dr Andrew Whitehill.

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4. Proposed Pilot Trial

With significant expertise developing novel and effective solutions for complex waste streams, EDL proposes to conduct a targeted pilot trial for asbestos and ACM at HCC's Silverstream Landfill located in the Wellington Region. The high-level objectives of this work will be two-fold:

- Determine the configuration of an MCD treatment plant, focusing on the number of continuous flow cascading reactors required to achieve designated treatment goals.
- Perform a feasibility study to establish CAPEX / OPEX requirements for a full-scale operational plant to be implemented at the Silverstream Landfill.

Successful trials to date have been completed at bench-scale and intermediate pilot-scale. Therefore, EDL intends to deploy a single or dual MCD reactor system, which will be operated in semi-continuous and continuous mode. It is important to note that EDL has already been granted permission from the local authority to conduct this trial. No further consenting is required at this time.

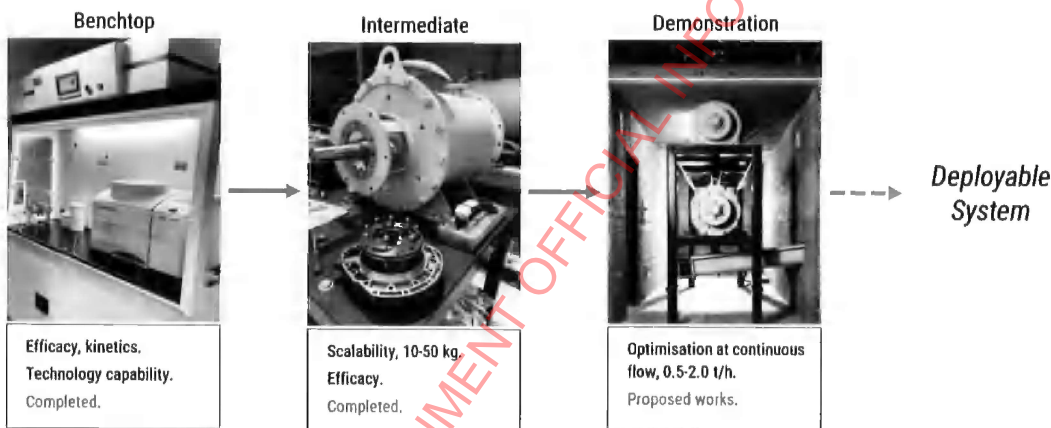


Figure 4. Various scales of EDL's MCD devices.

4.1 Technical Approach

The proposed validation project will comprise six major tasks:

1. **Develop and finalise demonstration trial plan.** Finalise the scope, objectives, and methodology for the validation trials. This includes confirming test parameters, treatment objectives, health and safety protocols, and performance metrics, in consultation with project partners and stakeholders.
2. **Equipment preparation and acquisition of ACMs.** Prepare all necessary equipment, including calibration, upgrades, or modifications to the mechanochemical plant. Secure and characterise one target cementitious ACM to ensure representative and compliant trial conditions. It is envisaged that up to 1 tonne of ACM will be treated as part of the proposed trials.
3. **Plant installation and commissioning.** Install the mechanochemical pilot treatment system at the designated site. Commissioning activities will verify system functionality, ensure safety compliance, and establish baseline operating conditions ahead of pilot trials.

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4. **Pilot trials and sample analysis.** Conduct pilot-scale treatment trials on ACMs using defined parameters. Collect samples before and after treatment, dispatch them for independent laboratory analysis, and assess data to evaluate treatment efficacy, and compliance with regulatory thresholds.
5. **Plant decontamination.** Upon completion of trials, the plant will undergo thorough cleaning and decontamination. This ensures safe handling, prevents cross-contamination, and prepares the system for future use at Silverstream or relocation.
6. **Data analysis and reporting.** Document and report on all trial activities, results, and findings. The final report will include performance assessments, compliance outcomes, operational learnings, and recommendations for commercial-scale implementation.

While there may be some overlap between these tasks, they will be seen as discrete components with their own respective objectives. The development of the demonstration plan described below is based on EDL's ~20 years' experience of scaling up the MCD technology to address complex waste issues. Relevant stakeholders that will be consulted during the development works include WorkSafe, Ministry for the Environment, and the Environmental Protection Agency.

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5. Schedule of Tasks

It is envisaged that the MCD trial programme will take up to 9 months to complete, from the development of the demonstration plan to final reporting. Major project tasks are shown in Table 1.

Table 1. Project Gantt chart.

Task	Month								
	1	2	3	4	5	6	7	8	9
1. Develop and finalise demonstration trial plan	■	■							
2. Equipment preparation and acquisition of ACMs	■	■	■						
3. Plant installation and commissioning				■					
4. Pilot trials and sample analysis					■	■	■		
5. Plant decontamination								■	
6. Data analysis and reporting							■	■	■

The reports to be completed and submitted to HCC are outlined below.

- Demonstration Plan: a draft version of the plan will be submitted to HCC prior to the commencement of major technology validation activities. Time will be allocated for review and potential amendments.
- Technical Report: a draft version of the final report will be submitted to HCC at the closure of the project timeline. The report will then be finalised following HCC's review, with amendments made as necessary.

In addition to providing above reports in accordance with best practice for a technology demonstration, EDL will disseminate data, progress updates, and learnings every 1-2 months via meetings which may be suitable for online platforms (e.g., Microsoft Teams, Zoom).

5.1 High Level Cost Breakdown

The total cost for this R&D programme is estimated to be \$979,000.00, of which \$365,000.00 is sought as a contribution from HCC. Company salaries equating to \$135,000.00 will be contributed in-kind by EDL. Utilisation of EDL's R&D facility in Auckland, New Zealand will facilitate the progression of the research programme, especially in terms of fabrication and assembly of unique MCD apparatus for trials.

EDL requests that HCC's total cost be spread across the 9-month timeline of the project, as outlined below:

- 50% of the total cost (\$182,000.00) to be released at the commencement of the project to cover costs related to equipment preparation, subcontractors, and overall project management.
- 30% of the total cost (\$109,000.00) to be released upon delivery of equipment to the Silverstream Landfill site.
- 20% of the total cost (\$73,000.00) upon delivery of final report.

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6. Expected Outcomes

Utilising EDI's pilot MCD system, it is envisaged that the outcomes of the project will sufficiently profile a scalable technological solution for the destruction of asbestos and ACM at requisite throughput rates that are relevant to landfill sites, like Silverstream. The major outcome of this work will be the technological development of MCD as a nonthermal destruction technique that can indiscriminately destroy asbestos / ACM received by landfills.

Furthermore, the MCD technology may be applied to other priority areas upon the completion of the proposed investigation, including the destruction of PFAS in AFFFs, spent sorbents containing PFAS, complex liquid wastes, and other hazardous wastes.

6.1 Benefits

The benefits below not only relate to the proposed pilot trial, but also to a plant either at or proximate to the Silverstream Landfill that is capable of processing industrial tonnages of asbestos or ACMs.

Potential Environmental Benefits

- Reduction in greenhouse gas emissions through the diversion of waste from disposal pathways.
- Lower emissions associated with landfill operations and the deferral of new landfill development.
- Enhanced biodiversity outcomes through the long-term avoidance of landfilling.
- Preservation of limited landfill capacity for truly non-recoverable residual waste.
- Decreased handling and disposal of hazardous or harmful substances to landfill.
- Less environmental pollution due to reduced release of contaminants.
- Reduced transport-related emissions by eliminating the need to ship complex waste streams to distant or offshore facilities.
- A practical demonstration of circular economy principles in action.

Potential Council Benefits

- Deferred or reduced capital expenditure associated with future landfill development.
 - Postponement of costs related to identifying and establishing new waste disposal solutions.
 - Potential for councils to generate additional revenue by applying gate fees to waste streams that might otherwise be diverted.
 - Partnerships with universities and research institutions can drive applied research in waste innovation, materials science, and clean technologies—potentially unlocking new commercial opportunities.
 - Reinforces leadership in sustainability, climate action, and the transition to a resilient regional economy.
- Creates avenues for constructive public engagement and community support.

~~CONFIDENTIAL~~***Potential City Benefits***

- Potential for Lower Hutt to have a world-leading asbestos / ACM treatment plant.
- Opportunities for local businesses to gain revenue and hire skilled labour due to the specialised supply chain required by EDL.
- Opportunities for local businesses to harness the unique capabilities offered by EDL and their technology.
- The recovery of potentially valuable outputs from the EDL process could enable the creation of local resale markets or establish new product lines.
- Local organisations have an option to dispose of harmful waste sustainably.
- Byproducts from the EDL process could be used by other nearby industries to create circular economy linkages.
- Educational opportunities for schools, universities and other institutions to see sustainable development technology in action.
- Rebranding Lower Hutt as a hub for green technology, industrial innovation and environmental leadership - thereby supporting tourism, talent attraction and further investment.

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Appendix A

Literature - Mechanochemical Treatment of Asbestos

While the focus of most academic MCD research has historically been directed toward treating organic pollutants, several research groups have published work related to the degradation of asbestos and ACM by HEBM. The research described herein was led by Plescia, Colangelo, Trapass and Gock.

Centrifugal and planetary ball mills are commonly utilised in laboratory benchtop scale research. Generally, the target asbestos or ACM is placed into a jar containing a designated number of ball bearings. The jar and balls can be composed of various materials depending on the application. Common composition materials include stainless steel, hardened steel, zirconium oxide, silicon nitride, and agate. The jar containing the asbestos or ACM and ball bearings is secured into the ball milling device and operated at high speeds to rapidly pulverise the matrix.

There is a considerable amount of evidence at the laboratory scale that fibrous asbestos can be completely transformed into an amorphous powder by mechanochemical milling. The most notable trials were carried out at the Italian National Research Council (Consiglio Nazionale delle Ricerche, CNR).

Plescia et al. (2003). Mechanochemical treatment to recycling asbestos-containing waste. Waste Management 23.

This work has been recognised as the benchmark for scientific evidence supporting the concept that mechanochemical milling can lead to the total destruction / amorphisation of asbestos in cementitious waste as well as friable asbestos. The central idea behind this work was the phenomenon that mechanochemical treatment of crystalline substances can lead to an extremely high degree of amorphisation and phase change, generally seen in thermal reactions exceeding 1,000°C. An interesting observation as mechanochemical processes generally do not exceed 150°C-170°C at operational scales relevant to this work.

Plescia and colleagues' employed phase contrast microscopy (PCM) and scanning electron microscopy (SEM) to show that no asbestos fibres remained between 4-12 minutes of milling, depending on the type of asbestos. X-ray diffraction (XRD) analysis of the post-milled powders also revealed the absence of diffraction peaks characteristically seen in asbestos samples. Cumulative analytical results from PCM, SEM, and XRD tests verify that ACM can be transformed to non-carcinogenic amorphous powders.

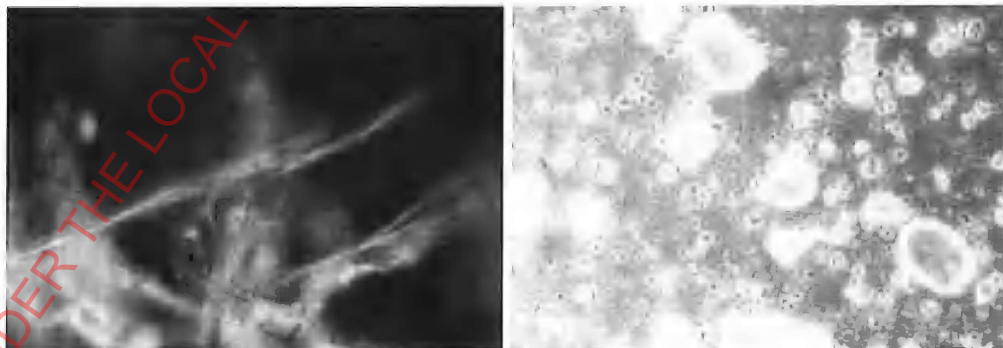


Figure 5. Phase contrast microscopy of ACM before milling (left) and after milling (right). Plescia et al., 2003.

Plescia and colleagues postulated the commercial viability of mechanochemical milling for ACM, as opposed to thermal treatment: "[Analytical results] for all waste samples confirm the possibility to

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use mechanochemistry as a fast and economic process for asbestos treatment." They go further by concluding that "the mechanochemical process can be successfully applied to [ACM] on an industrial scale."

Colangelo et al. (2011). Treatment and recycling of asbestos-containing waste. Journal of Hazardous Materials 195.

In 2011 Colangelo colleagues replicated the 2003 Plescia study and went on further to test the suitability of recycling post-milled powders to make up the mineral component in building materials. This paper provides strong evidence demonstrating that asbestos-free milled powders are suitable for use in a variety of civil engineering applications, specifically cements and mortars.

The main reasons that milled powders are appropriate for reuse in cements and mortars are: (1) suitable chemical and mineralogical composition; (2) superior mechanical performance of mortars containing milled powders; (3) accelerated initial hydration kinetics, related to curing time; (4) and a high degree of powder fineness suggests it can be used as artificial aggregate for specialised applications.

While Colangelo and coworkers also demonstrated that mechanochemical milling of ACM can lead to amorphous powders, they additionally showed that the resultant powders can be utilised as valuable cement and mortar additives; outperforming other mineral additives currently used in industry. Their closing statement expresses the promise of mechanochemical treatment of ACM and its recyclability: "This study leads to the conclusion that powders obtained through the high energy milling of asbestos-cement waste are asbestos-free and can be profitably recycled in the field of building materials."

Trapasso et al. 2012. Asbestos waste carbonation: a new asbestos treatment with CO2 recovery. Crete 2012: 3rd International Conference on Industrial and Hazardous Waste Management.

Trapasso and coworkers extended CNR's research by showing that the treated ACM can be used for carbon capture: *"The paper reports a new preparation process of materials made of magnesium oxide, magnesium hydroxide and magnesium carbonate starting from materials containing asbestos from natural sources (serpentine with chrysotile, ophiolites with amphiboles and asbestos of serpentine) through the use of mechanochemical high-energy mills. In the work we discuss the aspects related to the materials to be used, the mechanical activation parameters and the carbonation system in order to optimize the process and reduce the treatment costs. The method identified leads to the preparation of precursor materials usable in many chemical carbon dioxide capture process and as absorbent and dehydrating materials."*

The findings of the CNR laboratory trials were qualitatively confirmed by Auckland University of Technology (AUT) in 2015. These trials were able to replicate the CNR results using similar milling conditions. Rapid destruction was achieved, showing 100% asbestos amorphisation of ACM products (deteriorated wall panels in this case).

Gock et al. 1994. Verfahren zur Aufbereitung von faserstoffhaltigen Materialien. (Translation: Method for processing fibrous materials). German Patent No. 4332031.

A German patent from 1994 describes a process for the mechanochemical treatment of fibrous material, namely asbestos. This method was briefly described in a minerals engineering paper from 2009, which included a picture of the mechano-thermal pilot plant.¹² A vibratory mill was used to

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destroy asbestos fibres, while the thermal treatment aspect of the process is not discussed in any detail. While the results were extremely positive and material reuse was demonstrated, this patent was cancelled in 2002 due to non-payment of the annual fee. No additional or more recent information can be garnered following the termination of the patent.



Figure 6. Mechano-thermal asbestos pilot plant using a vibratory ball mill from the mid-1990s.

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Appendix B

MCD of ACM: 2015 and 2016 Pilot-Scale Trials

Using the MCD technology, pilot-scale ACM amorphisation trials were conducted in 2015 and 2016. The work was carried out by EDL at an existing landfill site operated by EnviroServ Waste Management (EnviroServ) in Johannesburg, South Africa. This site was selected for logistical purposes, as it was already an excellent source for a variety of ACMs.

These initial pilot scale trials can be divided into three discrete investigations, based on their overall objectives and reactor development:

- 2015 Pre-Trial - preliminary investigation carried out by EDL and EnviroServ.
- 2015 Trial - EDL explored the scalability potential of the MCD technology to treat ACM; in other words, can we replicate degradation results observed in the laboratory trials as described in the literature.
- 2016 Trial - EDL used the results and outcomes from the 2015 trial to further develop the testing methodology and enhance the reactor system.

Tauw Group BV Netherlands (Tauw) collaborated with EDL as an external consultant during the 2015 and 2016 trials, to determine whether the MCD process is an appropriate technology for the treatment of asbestos and ACM. As an experienced consultancy firm and specialists in waste management, Tauw were able to provide an onsite specialist technician to independently verify and validate the MCD process and carry out an appropriate sampling procedure.

2015 Pre-Trial Overview

In May 2015, EDL and EnviroServ carried out a basic milling procedure to degrade ACM using a single reactor MCD setup. This trial was conducted to establish if any asbestos amorphisation occurred in the MCD reactor, and if so, to what extent.

Selected samples were sent to SGS South Africa (Pty) Ltd in Johannesburg. SGS are a specialist environmental testing laboratory, certified to carry out asbestos testing. Each sample was analysed by SEM coupled with energy dispersive x-ray (EDX) spectroscopy for asbestos presence and identification.

2015 Pre-Trial Results

Analytical results for the 2015 MCD pre-trial are outlined in Table 2, while a brief explanation of the results is provided below. A copy of the analytical transcript is attached as Appendix B.

Table 2. 2015 Pre-Trial Results.

	Run 1	Run 2
Before MCD	AFD	AFD
After MCD	NAFD	NAFD

Notes:

1. NAFD = No Asbestos Fibres Detected. AFD = Asbestos Fibres Detected.

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SEM / EDX analysis did not detect any residual asbestos fibres in both treated samples. This shows that fibrous asbestos was transformed into amorphous powder. Furthermore, SEM results indicate the total amorphisation of asbestos fibres going through the MCD process. Agglomerates can also be observed in the SEM photos. These agglomerates were made up of extremely fine particles, which was also observed in later trials.

2015 Trial Overview

In line with the pre-trial, the overall experimental procedure was relatively straightforward, allowing for rapid analysis of samples and quick summation of results. Standard operating conditions were determined from EDL's past experience with the MCD technology, as well as comprehensive analysis of health and safety protocols for working with asbestos.

Two types of ACM were subjected to the MCD process. ACM Type 1 originated from roof sheeting and ACM Type 2 comprised of building panels. The composition of these ACMs are shown in Table 3 below.



Figure 7. 2015 trial setup at EnviroServ's landfill site in Johannesburg, South Africa.

Table 3. 2015 ACM Sample Composition.

	Chrysotile (%)	Crocidolite (%)	Origin
ACM Type 1	10 – 15	0.1 – 2	Roof Sheeting
ACM Type 2	10 – 15	5 - 10	Building Panel

Notes:

1. Percentage of asbestos type in ACM, given as proportion of total ACM mass (m/m).

It was imperative that the reactor was sufficiently prepared prior to feeding ACM through the MCD process. The reactor speed was set to an optimum rate and pre-heated to 140°C - 150°C with silica sand. Resultant silica discharge was weighed to ensure all silica was expelled from the reactor.

Crushed ACM (less than 10 cm in length) was then fed into the reactor inlet. The reactor's outlet valve was flushed with the treated material immediately before collecting samples in approved glass jars. Samples were collected every 15 minutes for up to 60 minutes. 5 trial runs were conducted in total.

Selected samples were sent to RPS Laboratories in the Netherlands. RPS is a specialist asbestos testing laboratory, certified by the Accreditation Council (NEN-EN-ISO / IEC 17025). Each sample was analysed by SEM coupled with EDX spectroscopy for asbestos presence and identification.

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2015 Trial Results

Analytical results for the 2015 MCD pilot trial are outlined in Table 4, while a brief explanation of the results is provided below. A copy of the analytical transcript is attached as Appendix C.

Table 4. 2015 Trial Results.

	Run 1	Run 2	Run 3	Run 4	Run 5
ACM Type	1	1	2	1	1
ACM Mass (kg)	9.20	9.25	10.0	10.0	20.0
0 - 15 mins	NA	NA	NA	NA	NA
15 - 30 mins	NA	NA	NA	NA	NA
30 - 45 mins	NA	NA	NA	NA	NA
45 - 60 mins	AFD	AFD	AFD	AFD	AFD
60 - 90 mins	-	-	-	NA	NA
90 - 120 mins	-	-	-	NA	NA

Notes:

1. NA = Not Analysed.
2. NA/D = No Asbestos Fibres Detected. AFD = Asbestos Fibres Detected.

Only the 45-60 minute samples were sent for analysis, in order to obtain indicative results quickly. SEM / EDX results revealed that fibrous asbestos destruction between 80.0% and 99.3% was taking place within the reactor. While some asbestos fibres were detected in the sample matrices, there was a significant reduction in the overall percentage (wt%) of remaining asbestos fibres in the samples.

Further analysis of the 45-60 minute samples revealed that crocidolite fibres were not detected in Runs 1, 3, and 4; indicating 100% destruction of crocidolite fibres in these 'Runs'. Furthermore, the overall percentage of chrysotile asbestos had decreased from 10-15% to 0.1-2% in all samples. Inadequate processing / mixing or cross-contamination may have led to the observed results.

SEM photos showed that large asbestos fibres remained after going through the reactor. This is a clear indication that some fibres are not being subjected to the milling process and were likely accumulating at the collection valve where no balls can collide with matrix particles.

Mechanical operating issues prevented further trial runs. Subsequently, it was envisaged that the reactor system would be inspected and modified for later trials. This work would be done to enhance ACM destruction.

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2016 Trial Overview

The major variations between the 2015 and 2016 trials were a result of continuous development of the MCD reactor for asbestos degradation, as well as development of the operating method.

The basic 2015 trial procedure outlined above remained the same for the 2016 trial, except for the amendments summarised below:

- A bespoke reactor closing cap was made to cover the cavity left after the return auger system was removed from under the discharge valve.
- A discharge drum was added for dust-free sample collection.
- An infeed drum with sliding gate valve for easy loading was added. This appendage for loading only. It was appropriately sealed when the reactor was in operation.
- A ball valve was installed adjacent to the infeed. A ½ inch outlet was piped through a water container bubble system. This was done as a precaution to aid ventilation if needed.
- The most significant change was simulating a multi-reactor (or stacked) system. This was done by collecting the discharged material and manually returning the treated ACM to the infeed, to be processed again. Samples for analysis were taken before returning the treated material to the infeed drum. This was done in 15-minute intervals.
- An inert mineral additive (ADD1) was added to the treated material in the collection drum before re-entering the reactor via the infeed drum. The amount of additive was different in each of the runs, ranging from 0 - 20% (wt%).

General maintenance was also carried out. This included replacement and bedding of gland packing and examining reactor integrity.



Figure 8. Discharge drum (top left); crushed ACM (bottom left); infeed drum (right).

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Again, two types of ACM were subjected to the updated MCD process. ACM Type 3 originated from cement piping and ACM Type 4 comprised of cement roofing. The composition of these ACMs is shown in Table 5 below.

Table 5. 2016 ACM Sample Composition.

	Chrysotile (%)	Crocidolite (%)	Origin
Re-Run	0.1 - 2	0.1 - 2	Treated 2015 ACM
ACM Type 3	10 - 15	2 - 5	Cement Piping
ACM Type 4	10 - 15	2 - 5	Roof Sheeting

Notes:

1. Percentage of asbestos type in ACM, given as proportion of total ACM mass (m/m).

In total, 4 trial runs were carried out in 2016, including a re-run of material from the 2015 trial. This 're-run' comprised of treated ACM from Run 1 and Run 2 of the 2015 trial. Selected samples were sent to SGS South Africa (Pty) Ltd in Johannesburg. SGS is a specialist environmental testing laboratory, certified to carry out asbestos testing. Each sample was analysed by SEM coupled with EDX spectroscopy for asbestos presence and identification.

2016 Trial Results

Analytical results for the 2016 MCD pilot trial are outlined in Table 6, while a brief explanation of the results is provided below. A copy of the analytical transcript is attached as Appendix D.

Table 6. 2016 Trial Results.

	Re-Run	Run 1	Run 2	Run 3
ACM Type	Re-Run ACM	3	3	4
ACM Mass (kg)	10	10	10	10
0 - 15 mins	NA	AFD	AFD	AFD
15 - 30 mins	NAFD	NAFD	AFD	AFD
30 - 45 mins	NAFD	NAFD	NAFD	NAFD

Notes:

1. NA = Not Analysed.
2. NAFD = No Asbestos Fibres Detected. AFD = Asbestos Fibres Detected.

SEM / EDX analysis did not detect any residual asbestos fibres in all of the 30-45 minute samples. This shows that all fibrous asbestos is transformed into amorphous powder by 45 minutes; or in other words, all asbestos is degraded after flowing through 3 MCD reactors. The addition of the inert additive

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appears to have significantly increased degradation of residual asbestos fibres. Further testing is required to evaluate the effect and necessity of additives.

Total amorphisation occurred at different time intervals. The 'Re-run' and 'Run 1' samples returned no traces of asbestos fibres in the 15-30 minute samples. The samples which revealed the presence of asbestos fibres ('Run 1' 0-15 minutes; 'Run 2' and 'Run 3' 0-15 and 15-30 minutes) may have a lower asbestos concentration, however EDL could not quantitatively measure exactly how much asbestos remained.

SEM photos clearly show the total amorphisation of asbestos fibres going through the MCD process, demonstrating the effectiveness of MCD in 100% fibrous asbestos destruction.

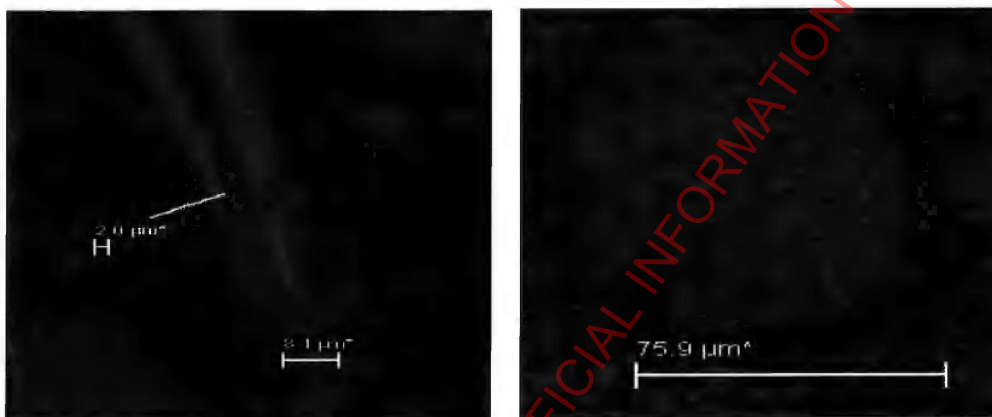


Figure 9 SEM of representative 'Run 4' matrix. 0-15 minute sample (left) and 30-45 minute sample (right). Complete amorphisation is achieved by simulated multi-reactor MCD trial.

Discussion: Pilot-Scale Development

The waste industry is continuously exploring pathways to develop technological solutions and innovative recycling options for asbestos challenges related to demolition waste containing vast amounts of ACMs. EDL's MCD process presents an attractive recycling technology, capable of completely degrading ACM into an inert by-product that can be reused in civil engineering applications, such as the mineral component of cementitious building materials.

Published research in high energy milling has always been at the laboratory scale, with promising results showing rapid asbestos amorphisation. EDL's MCD process demonstrates the first trial to provide evidence showing that the same degree of asbestos amorphisation can be scaled up.

The results outlined in this section demonstrate the suitability and effectiveness of EDL's MCD reactor technology for the degradation of asbestos in a variety of ACM. Although this body of research was carried out at a pilot scale capacity, the capabilities of scaling up the process have been well established by EDL's previous experience and knowledge with full scale soil decontamination work.

The fundamental milling parameters and conditions in the 2015 trial were chosen to achieve high asbestos destruction rates. However, engineering issues were encountered, leading to the modification of the MCD reactor and adjustment of methodology for the 2016 trial. This process development and mill tuning stage proved successful: no asbestos fibres were detected in the 30-45 minute samples of all the 'Runs' in the 2016 trial.

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The two major contributing factors which led to the increased rates of degradation in the 2016 trial were: (1) simulating a multi-reactor system, and (2) the addition of a naturally occurring inert additive to the ACM matrix. However, additional testing is required to assess the overall effectiveness of additives and the underlying mechanism.

Simulating a multi-reactor system had the obvious advantage of increasing the exposure of the ACM matrix to the high energy destructive environment within the reactor mill. This was an ideal procedural adjustment, as a multi-reactor (or stacked) system is a more realistic representation of a real-world operational plant. EDL estimates that 90% of asbestos degradation would take place in the first reactor, with subsequent reactors treating residual asbestos fibres which can be hard to treat.

The addition of the inert additive in the 2016 trial also led to enhanced degradation rates. This trial demonstrated that the addition of the inert additive increases the energetic environment within the MCD reactor. The fractured additive surfaces, which occur because of multiple ball-to-surface collisions within the reactor, create reactive sites which can transfer relatively large amounts of energy to asbestos fragments. This process ultimately leads to the breakdown of asbestos' crystalline structure. The final breakdown products for the degradation of ACM are the inert mineral constituents which make up ACM, with no fibrous morphology.

Conclusion: Pilot-Scale Development

The objectives of these trials were to assess the capabilities of the MCD process in degrading asbestos, and to demonstrate its scalability to effectively recycle asbestos and ACM as an appropriate technological solution. Furthermore, it was EDL's aim to link published laboratory scale experiments with the pilot scale trials carried out in 2015 and 2016. To EDL's knowledge, this is the first investigation to successfully replicate and validate published ACM degradation data at a scale potentially capable of meeting the demands of industry.

Although the 2015 trial 'Runs' did not realise the full destructive ability of MCD, it effectively informed on future modifications to the reactor and amendments to the overall procedure, in order to achieve enhanced amorphisation. The 2015 trial also revealed potential sources of cross-contamination and developed EDL's understanding of how ACM travels through the reactor.

Taking outcomes of the 2015 trial into consideration, modifications and adjustments were implemented for the 2016 trial. The results were extremely positive: total asbestos amorphisation was observed in all of the 'Runs' of the 2016 trial. ACM exposure to the destructive environment within the reactor was achieved by simulating a multi-reactor system. A naturally occurring inert material was also added in various concentrations to provide highly reactive surfaces after fracture. Cumulatively, these changes led to complete ACM degradation within 45 minutes for all samples.

The conclusive outcomes of the 2015 and 2016 pilot trials demonstrate that complete and rapid amorphisation of fibrous asbestos in cementitious materials can be achieved using EDL's MCD technology. In addition, asbestos degradation rates are significantly enhanced by using a (simulated) multi-reactor system, as well as exploiting the reactivity of the milled additive.

This body of work has summarised the fundamental research and development EDL are conducting in its continuous advancement of the MCD technology for ACM degradation. The outcomes of this work have clarified objectives for future method development and research. Data obtained from this research and information found in the literature show that MCD is a viable degradation method for ACMs.

Memorandum

Chief Executive

Director	Alison Geddes Director, Sustainability and Environment
Author	Andred Saker Senior Advisor, Resource Recovery
Reviewed by	Jörn Scherzer Head of Climate, Waste & Resource Recovery
SUBJECT	WASTE LEVY FUNDING CONTRIBUTION FOR ASBESTOS TREATMENT DEMONSTRATION AT SILVERSTREAM LANDFILL

Purpose

This memorandum seeks your approval to provide ring-fenced waste levy funding of \$365,000 to Environmental Decontamination Limited to undertake a practical demonstration of their asbestos treatment technology at the Silverstream Landfill.

Executive Summary

A waste levy funding contribution of \$365,000 to Environmental Decontamination Limited (EDL) would enable a practical demonstration of their asbestos treatment technology to proceed at the Silverstream Landfill, in line with Council's wider approach to supporting opportunities to recover resources from the construction and demolition waste stream.

EDL's technology has been validated internationally and offers a safe, viable and innovative means of permanently neutralising the harmful fibres in asbestos and asbestos-containing materials (ACMs) and transforming them into reusable commodities.

A successful practical demonstration may lead directly to the development of a commercial asbestos and ACM processing facility in Lower Hutt, in the context of efforts to improve the recovery of construction and demolition

(C&D) waste. This could position Silverstream Landfill as a hub of national significance in waste innovation.

The practical demonstration aligns with Local Action #11 of Council's Waste Management and Minimisation Plan 2023-29 and complies with section 32 of the Waste Minimisation Act 2008.

The practical demonstration would also support Council's circular economy, climate change and economic growth aspirations.

The proposed funding contribution represents around 15% of Council's annual waste levy allocation and can be made without adversely impacting the delivery of other planned waste minimisation projects or affecting rates.

Officers recommend approving the funding contribution to enable the practical demonstration to proceed without delay.

Recommendation(s)

That you approve a waste levy funding contribution of \$365,000 to EDL to undertake a practical demonstration of their asbestos treatment technology at the Silverstream Landfill.

Note that EDL are available to present on the technology and proposed demonstration if desired.

Background/Context

The Problem:

The Wellington region is currently serviced by three Class 1 municipal landfills: Silverstream, Southern, and Spicer.

Silverstream Landfill is the largest by tonnage and receives approximately 155,000 tonnes of mixed waste annually. With ongoing development, the Landfill is expected to last another 25 years.

Maximising resource recovery opportunities is critical to prolonging the life of the Silverstream Landfill and thus delaying the need to build a new landfill in Lower Hutt or the Wellington region in the future.

Construction and Demolition (C&D) waste is a significant waste stream for landfills across Aotearoa New Zealand and is estimated to make up about 69% of all waste to levied disposal facilities (class 1-4 landfills) (MfE C&D Baseline Report, 2025).

The tonnage of C&D waste entering the Silverstream Landfill is difficult to quantify, however the most recent Solid Waste Analysis Protocol undertaken in early 2022 estimated that C&D waste: (a) made up 22% of general waste at the landfill tip face, and (b) was the largest single activity source at the Transfer Station accounting for 47% of waste by tonnage.

A relatively small but recalcitrant (persistent and hazardous) waste stream that falls under the broader C&D waste umbrella is asbestos and asbestos containing materials (ACMs).

Asbestos is a naturally occurring group of six fibres that have been used historically for their strength, fire resistance and insulating properties in the building and construction industry.

When disturbed, the fibres can be released into the air and inhaling them can cause serious health problems, including lung cancer, mesothelioma and other lung/respiratory conditions.

Although the amount of asbestos and ACMs received at Silverstream landfill is relatively low compared to other waste streams, and asbestos disposal does not result in the generation of methane, asbestos and ACMs present a significant legacy issue due to their:

- Persistence in the environment
- Toxicity to human health
- Cumulative impact on landfill airspace.

Typically, Silverstream Landfill receives approximately 2,000 to 5,000 tonnes of asbestos or material containing asbestos per year (based on the last three years of data).

The handling of Asbestos and ACMs waste is a highly specialised and regulated industry. Only licensed practitioners with the appropriate expertise and equipment can safely remove, transport and dispose of the waste. The disposal of asbestos and ACMs at the Silverstream Landfill is confined to purpose-built cells.

The Solution:

EDL is a New Zealand owned and operated research & development company based in Auckland that has been operating in the waste sector for the past 20 years.

EDL is well known in the New Zealand and the global waste sector. They have collaborated with the following organisations:

- United Nations Development Programme
- United States Department of Defence
- United States Environmental Protection Agency
- Global Environment Facility
- University of Auckland
- Ministry of Primary Industries.

EDL strive to develop viable technologies to destroy or neutralise recalcitrant waste streams and transform them into safe, reusable commodities with commercial applications.

The current focus of EDL is to commercialise their globally patented, mechanochemical process that converts asbestos and ACMs into an inert, amorphous powder.

This powder can be safely reused as a filler in low carbon "green" concrete, thus creating a circular, value-added product from a traditionally hazardous waste stream.

Figure 1: Example of amorphous powder from the mechanochemical process



The innovative mechanochemical technology involves accelerating hundreds of ball bearings up to extremely high velocities inside a reactor where the ensuing high momentum collisions destroy the asbestos fibres and render them non-hazardous.

Figure 2: Utilising the mechanical energy of high-velocity ball bearings within specialised reactors



The Practical Demonstration

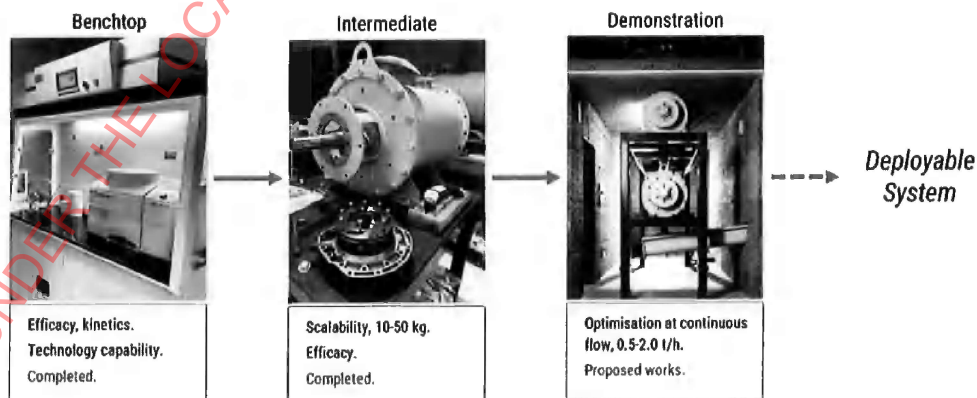
The mechanochemical technology has been validated by world class laboratories and in field experiments, including in the United States.

However, a practical demonstration of the mechanochemical technology in an operational environment is required before the technology can be scaled up to a commercial level.

The practical demonstration will involve installing two modified 40-foot containers to accommodate the plant & equipment required for the demonstration in a dedicated area at the Silverstream Landfill.

The plant and equipment will not operate continuously over the period of the practical demonstration but rather intermittently when different loads of asbestos and ACMs are tested and the outputs sent to the United States for laboratory analysis.

Figure 3: EDL's route to commercialisation



The relationship between Council and EDL was fostered after representatives from the Waste Management Institute of New Zealand advised Council officers that EDL were seeking to collaborate with a Council that owned a landfill to demonstrate their technology.

In May 2024, a Memorandum of Understanding (MoU) was signed between EDL and Council to enable a 6 to 12-month practical demonstration to begin at the Silverstream Landfill in early to mid-2025.

The \$5 million cost of the practical demonstration was to be jointly funded by EDL and the UK Government's Nuclear Decommissioning Authority.¹

However, the Nuclear Decommissioning Authority withdrew funding as part of a suite of cost-cutting measures by the UK Government in early 2025. This withdrawal resulted in EDL suspending the practical demonstration until such time as the shortfall could be addressed.

In exploring alternative funding options, EDL engaged with the Ministry for the Environment regarding support from the Waste Minimisation Fund. The Ministry for the Environment advised that funding from the Waste Minimisation Fund is currently earmarked for industrial scale waste infrastructure projects and that applications involving pre-commercial projects were unlikely to succeed with the current investment priorities.

However, the Ministry for the Environment did express an interest in supporting a commercial asbestos and ACM processing facility – subject to a successful practical demonstration of the technology.

The Opportunity for Council

The UK government's decision to withdraw funding has resulted in a unique opportunity for Council to intercede and fund the shortfall.

Funding the shortfall could unlock strategic, environmental, and potential economic benefits that could follow from a successful practical demonstration and subsequent commercial development.

EDL have advised Council that a successful practical demonstration may lead directly to the development of a world-class commercial asbestos and ACM treatment facility at or near Silverstream Landfill.

¹ The funding to date has been to design, build and test the specialised equipment for the practical demonstration.

The Silverstream Landfill would be the ideal location for a commercial asbestos and ACM plant given the Landfill's existing resource consent framework, proximity to major urban centres and accessibility to transport networks.

A commercial plant could serve Lower Hutt, the Wellington region and the Lower North Island.

By supporting the practical demonstration, Council would:

- Proactively address a hazardous C&D waste stream.
- Complement Council's other waste diversion initiatives, including other C&D waste reduction projects and initiatives.
- Position Silverstream Landfill as a genuine leader at the cutting-edge of waste innovation.

EDL have provided a detailed proposal for the asbestos treatment practical demonstration with the funding shortfall covered by Council.

The practical demonstration would initially process asbestos and ACMs, but the versatile nature of the mechanochemical technology means it can be easily adapted to process contaminants such as persistent organic pollutants (POPs)² and Perfluoroalkyl and Polyfluoroalkyl substances (PFAS).³

POPs and PFAS are some of the most difficult and harmful contaminants known to the international waste community. Waste contaminated with these substances has also been disposed at Silverstream in the recent past, such as PFAS contaminated soil from the Ohakea airbase.

If the demonstration results in the development of a commercial plant, then this would complement the potential Soil and Aggregate Recycling Facility (SARF) that is currently under investigation in a collaboration between Council and Fulton Hogan.

² Persistent Organic Pollutants (POPs) are toxic chemical substances that persist in the environment, bioaccumulate through the food web and pose risks to human health and ecosystems.

³ Polyfluoroalkyl Substances (PFAS) are a group of synthetic chemicals used in industrial and consumer products for their resistance to heat, water, and oil. PFAS are highly persistent in the environment and have been linked to a range of adverse health effects

The SARF would process high volume, low contamination waste soils and aggregates, whereas the EDL commercial plant would treat low volume, high contamination materials.

Together, these facilities could establish Silverstream Landfill as a national waste innovation hub, supporting both environmental leadership and regional economic development.

Moreover, representatives from the C&D industry have advised Council officers that not having a safe and viable means of disposing of asbestos, ACMs and other recalcitrant waste streams could inhibit future infrastructure development in the Wellington region.

Figure 4: Example of an overseas SARF



Benefits of the Investment

The benefits of a commercial asbestos and ACM plant, if built, are summarised below.

Environmental Benefits:

- Reduced greenhouse gas emissions from avoiding landfill expansion (construction work) and reducing the transport of waste to distant or offshore facilities.
- Avoided biodiversity loss associated with future landfill development.
- Conservation of landfill airspace for residual waste that cannot be diverted or recovered.
- Reduced handling and landfilling of harmful and toxic materials.
- Less pollution discharged into soil, air and water systems.

- Tangible implementation of circular economy principles through material recovery and reuse.

Council Benefits:

- Deferred capital expenditure by delaying the need for new landfill cell construction or new disposal solutions.
- Opportunity for Hutt City Council to host a nationally significant asbestos and ACM treatment facility.
- Potential to generate new revenue streams through gate fees from regional and national asbestos and ACM waste accepted for treatment.
- Opportunities to collaborate with research institutions on applied innovation in waste treatment, materials science and clean technology.
- Strengthened alignment with the Council's climate action and sustainability commitments.
- Supports delivery of Local Action #11 in Council's Waste Management and Minimisation Plan.

Broader Benefits:

- Opportunity for local businesses to grow and upskill in support of EDL's specialised supply chain.
- Creation of local market opportunities through the reuse of EDL's inert byproducts (e.g. green concrete fillers).
- Potential for new product lines or resale markets based on recovered outputs.
- Licensing or franchising potential of the technology to other jurisdictions or councils.
- Educational opportunities for schools and universities to engage with practical sustainability initiatives.
- Promotes Lower Hutt as a national hub for clean technology, environmental innovation, and sustainable industrial leadership supporting talent attraction and further investment.

Source of Funding

The funding contribution from Council would come out of Council's waste levy funds.

The funding contribution amounts to approximately 15% of Council's annual waste levy share received from the Ministry for the Environment (\$2M+) and hence represents a relatively minor share of the overall funding pot.

Council has also saved up over \$1.5M in its ring-fenced waste levy reserve fund (unspent funds from previous years), meaning that should the FOGO service go ahead, Council has already saved up most funding required to enable the bin rollout (\$1.6M).

Providing the funding contribution for the practical demonstration will not (a) adversely affect the Climate, Waste and Resource Recovery team's ability to deliver on projects currently underway or planned, or (b) negatively impact on rates as waste levy funds are ring-fenced for waste minimisation purposes.

Section 32 of the Waste Minimisation Act 2008 stipulates that territorial authority waste levy funds must be spent (1) *on matters to promote or achieve waste minimisation; and (2) in accordance with its waste management and minimisation plan.*

Funding the practical demonstration at Silverstream Landfill aligns with the Waste Management and Minimisation Plan Local Action #11 to "*Investigate current, new and emerging technologies and/or approaches that support the future of waste disposal.*" [Pg. 43]

Investment Options

The table below provides a precis of the investment options available and their implications:

Table: investment options and implications

Investment Option	Implications
Full funding (\$365,000)	- Outcome: Immediate commencement of project planning and mobilisation. - Timeline Impact: No delay; preparation for the practical demonstration can begin as scheduled.

Investment Option	Implications
	Strategic Advantage: Position Council and Silverstream Landfill as national leaders in asbestos treatment innovation. Maximises opportunity for early access to commercial asbestos and ACM plant at or near Silverstream Landfill.
Partial funding (shortfall of up to \$50k)	- Outcome: EDL seeks top-up funding from aligned commercial partners or other regional stakeholders. - Timeline Impact: 6 to 9-month delay expected to secure co-investment; project remains high priority within EDL's R&D pipeline but there are risks of not securing funding.
Partial funding (shortfall of up to \$100k)	- Outcome: EDL applies for competitive co-funding (e.g. government grants) or enters consortium negotiations. - Timeline Impact: 12 to 15-month delay anticipated due to application lead times and stakeholder alignment. EDL may maintain technical activity in parallel to reduce future ramp-up time, but there are risks of not securing funding.
No funding	- Outcome: EDL must reprioritise internal resources to focus on other funded projects. The project may be discontinued indefinitely should Council provide no funding, or the practical demonstration may relocate to another council region with stronger co-investment potential. - Timeline Impact: 18-month, or longer, delay expected while full alternative funding is sourced. Practical demonstration may not be conducted at Silverstream landfill.

Risks Associated with Investment

Financial Risk to Council

In light of potential financial risks, officers commissioned independent consultancy Abbot Consulting to undertake due diligence on EDL. The due diligence report made the following recommendation:

"This due diligence review process has provided no alarms or concerns regarding the initiation of a partnerships trial approach as suggested and recommends that Council proceed with this trial as proposed." [pg. 4]

Potential financial risks can be mitigated by adopting a staged approach to making payments to EDL subject to the successful completion of certain milestones:

- 50% of the total cost (\$182,000.00) to be released at the commencement of the project to cover initial costs.
- 30% of the total cost (\$109,000.00) to be released upon delivery of equipment to the Silverstream Landfill site.
- 20% of the total cost (\$73,000.00) upon delivery and acceptance of final report to Council.

Reputational Risk

There is a possibility of negative publicity for the Council if the practical demonstration is unsuccessful.

This risk is inherent with the demonstration of any new technology. However, the risk has been partially mitigated by undertaking independent due diligence, which found no concerns with proceeding to the practical demonstration phase.

In particular, the due diligence report: (a) cited validation of EDL's technology by world-class laboratories from different countries, and (b) recognition and/or endorsement of the technology in respected international publications and research journals.

In June 2025 EDL won the Waste Management Institute of New Zealand excellence award for the most sustainable and innovative waste disposal initiative in New Zealand.

Operational Risks

The handling and processing of asbestos and ACMs carries inherent health and safety risks. These risks have been proactively mitigated through a collaborative approach involving:

- EDL as the expert lead for all safe handling, containment, and treatment procedures for asbestos and ACM in accordance with regulatory and industry requirements.
- Tonkin & Taylor as the technical consultancy appointed by Council to support the management of the Silverstream Landfill including all projects, activities and monitoring & compliance work.
- Waste Management NZ as the contracted landfill operator, providing day-to-day oversight of site operations in coordination with EDL's delivery and operations team.

The details required to facilitate the safe and efficient organisation of the practical demonstration are encapsulated in the original MoU that was signed between Council and EDL in May 2024.

Resource management risks have been minimised by Tonkin & Taylor submitting an Outline Plan that was approved by Council's resource consents team on 12 December 2024.

Procurement Risks

EDL is the world leader of mechanochemical technology and is the only known company in the world that can deliver the practical demonstration.

A tender exemption enabling EDL to be directly sourced has been endorsed by the Procurement team.

Consultation

In developing this memorandum, the resource recovery team have engaged with the following business units:

- Business & Economy
- Procurement
- Legal

People Implications

The practical demonstration will be resourced and managed entirely by EDL employees.

As such, any wellbeing and workforce considerations will be the responsibility of EDL and subject to their own policies, practices and procedures.

Financial Implications

If approved, the funding contribution will come from Council's levy funds, which are currently used to fund a range of waste minimisation projects, initiatives and activities.

Partial funding of the practical demonstration will result in a protracted or indefinite delay of the practical demonstration while EDL source additional funding to cover the shortfall.

Legal Implications

The use of waste levy funds for the purposes of the practical demonstration is consistent with section 32 of the Waste Minimisation Act 2008.

The use of Silverstream Landfill for the practical demonstration is consistent with the Landfill's existing resource consent framework as described in the Outline Plan and approved by Council's Resource Consents team.

Technology and Privacy Implications

The mechanochemical process that underpins the EDL technology is commercially sensitive and is protected by New Zealand and International patents to guard against intellectual property theft.

The MoU includes confidentiality/non-disclosure provisions to help safeguard proprietary information, trade secrets and other potentially sensitive information associated with EDL's technology.

EDL have confirmed they will provide Council with data, results and other information relating the practical demonstration, which may have to be withheld under section 7(2)(b)(ii) of the Local Government Information and Meetings Act 1987 if disclosure would prejudice commercial interests.

Climate Change Implications

There are emissions associated with undertaking the practical demonstration, but they are not considered significant.

As noted previously, a potential future commercial asbestos and ACM plant in Lower Hutt could achieve emission savings by avoiding the need to dispose of recalcitrant waste streams to landfill (avoided landfill air space construction) or transporting waste to distant and/or international processing facilities.

Furthermore, a commercial asbestos and ACM plant located at the Silverstream Landfill could fully operate on electric power due to Council's recent investment in a heavy-duty EV charging hub onsite.

Health, Safety and Security Implications

The MoU requires EDL to provide Council a comprehensive health and safety plan for approval to safeguard the ongoing health and safety of all parties associated with the practical demonstration.

The demonstration plant and equipment have been designed in such a way that physical handling of raw asbestos and ACMs by people is not required.

Communication and Engagement

Council has been providing regular updates on the intended practical demonstration through committee papers to the Climate Change and Sustainability Committee.

Next steps

Note that EDL are available to present on the technology and proposed demonstration to you.

If you approve the funding contribution, the following steps will occur:

A contract between EDL and Council will be signed giving effect to the funding contribution.

EDL have confirmed that once funding has been received, the demonstration plant and equipment would be transported, installed and commissioned at Silverstream Landfill over the next few months.

Council officers will liaise with EDL and Waste Management NZ to ensure that all facets of the practical demonstration will run as smoothly and efficiently as possible.

Attachments

There are no attachments to this paper.

mark abbot consulting

organisational analysis, optimisation and implementation

10 June 2025

Due Diligence

Environmental Decontamination (NZ) Ltd

Consideration for partnership trial to treat Asbestos Containing Materials.

HUTT CITY COUNCIL

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Building capability— —Improving performance

Mark Abbot Consulting Ltd specialises in the development of organisational behaviour and culture - purpose, strategy and its implementation, and the enablement of sustainable enterprises.

We work to support private sector enterprise development and have a long history of local government engagement, including significant procurement assignments; service delivery reviews; governance support; and transformational initiatives.

This review is subject to the disclaimers noted.

s7(2)(a)

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EXECUTIVE SUMMARY

The management and treatment of various waste streams continues to pose issues for landfill operators and processors. These issues manifest themselves in the actual capacity required to contain and manage toxic or harmful materials including the provision for increased containment areas; the additional safeguards and costs needed to receive materials and safeguard the general public; the protracted timeframes for containment, given many of these compounds are not degrading or, if they do, breakdown in such a manner as to cause additional health and safety concerns.

The treatment options for Perfluoroalkyl Substances (PFAS), Persistent Organic Pollutants (POPs), Dioxin, and Asbestos therefore become topical in a landfill or treatment environment that has capacity and expansion challenges; is proximate to neighbouring populations; and is potentially one of a limited number of facilities permitted to receive and dispose of such materials.

Any option to consider the destruction of these contaminants is therefore worthy of assessment and investment, particularly where that assessment includes the neutralisation of the hazard and the application of that neutralised substance to products of reuse and reapplication.

Following preliminary work undertaken by Environmental Decontamination (NZ) Ltd (EDL) and the UK Nuclear Decommissioning Agency, Hutt City Council now has the opportunity to undertake, in partnership with the science-based company, Environmental Decontamination (NZ) Ltd, a trial to treat asbestos waste at its Silverstream Landfill. The applications of the treated and inert product are expected to be suitable for roading aggregate applications, demonstrating circularity of this, currently, toxic waste stream.

The trial investment is anticipated to be approximately NZD365,000, proposed to be funded by a contribution from Council's share of the Waste Levy. Council may consider this to be significant in terms of the application of levy funds and is right to be cautious in their decision-making, however the demonstration of any benefits gained from proving, or even disproving, the resulting technology potentially delivers substantial financial and asset (landfill) benefit far in excess of this project cost.

Naturally, the commercialisation following any trial would be subject to a separate business case and justification in its own right based on asbestos and other toxin treatment; freeing up limited landfill capacity; and reducing serious health and safety risk as a consequence of receiving these materials. For now, the decision is centred on the application of levy funding to a pilot trial and the comfort that Council has in its technology partner, being EDL.

While EDL is a privately held company, access to financial, funding, people and general resourcing information is limited. This due diligence process has relied on publicly accessible data and information; meeting with company representatives; acknowledgement of EDLs activities in the New Zealand waste minimisation sector as industry members of WasteMINZ, being the largest representative body of Aotearoa New Zealand's waste, resource recovery and contaminated land sectors (noting EDL as Award Winners at the 2025 Annual Conference in the category: Most Sustainable / Innovative Waste Disposal Initiative: Harnessing the potential of mechanochemistry for complex waste challenges); and reputational commentary from government funders and partners including Ministry for the Environment and Ministry for Primary Products.

RECOMMENDATION

This due diligence review process has provided no alarms or concerns regarding the initiation of a partnership trial approach as suggested and recommends that Council proceed with this trial as proposed, and as prepared for.

There will be facets of this trial that should be explored and documented prior to initiation, including the ownership of Intellectual Property (EDL) of both technology and trial results, understanding that a Memorandum of Understanding is in place; the relationship of all parties likely to be impacted by this trial, including that of the landfill operator; the timeframe and timelines anticipated as being appropriate to an exercise of this scale; the extent to which Council will use resulting data, and therefore the expectations including timeline of commercialisation if successful in any public relations or media outreach.

From a practical perspective, local authorities have the ability to influence the reduction in waste, and particularly the elimination of the hazards associated with certain waste groups. Funding mechanisms such as the waste levy provide that mechanism for trial and process opportunity which may be difficult in many other commercial settings or disposal providers.

DISCLAIMER

This report has been prepared to provide advice to Hutt City Council (Council or HCC) in the consideration of potentially entering into a trial with Environmental Decontamination (NZ) Ltd (EDL) for the treatment of asbestos waste at Council's Silverstream Landfill.

This overview is not intended to cover any aspects of the technical efficacy or potential success of that trial, after all, that is what the trial itself will uncover.

The intention here is provide commentary, identify concerns or opportunities, for Council to consider in terms of entering into a trial process. The focus, therefore, is on the reputation and history of EDL as a viable and trusted partner in this process.

As a privately held entity, EDL is not required to disclose much information as to its financial wellbeing, history or connections. Information gathered has been obtained via public domain references, where possible, interview meetings with company representatives, and discussions with industry partners.

Council must therefore rely on its own decision-making process in reaching a conclusion as to trial partnership and the benefits of that work.

The result of this review is a recommendation that Council should consider this pilot project as being of relatively low risk and therefore one to proceed with.

While the majority of information contained in this document could be considered accessible in the public domain, there may be items of commercial sensitivity which are best contained within Council and between Council and EDL.

Therefore, the contents of this document, and subsequent business case or findings from this trial, should be considered commercially sensitive and not discoverable through the Local Government Official Information and Meeting Act 1987.

DUE DILIGENCE: ENVIRONMENTAL DECONTAMINATION (NZ) LTD

Background

Since late in 2023, Environmental Decontamination (NZ) Ltd and Hutt City Council have been working collaboratively towards initiating a 6-month trial of technology targeted at decontaminating asbestos and asbestos containing materials.

Initially this trial was contingent on funding to EDL from the UK Nuclear Decommissioning Agency. However, advice that the Agency had withdrawn funding for the trial due to cost-cutting measures in the UK has required HCC to reconsider its funding options in order to support the conclusion of the trial.

Investment

To maintain the impetus of the trial, HCC would be required to invest NZD365,000 to EDL, with this sourced from HCC's accumulated Waste Levy Funds.

This sum is assumed to be fair and reasonable in terms of application to reduce waste and free up capacity at Council's Silverstream Landfill noting a new reduction or treatment method is the target for such funding.

However, in order to ensure appropriateness of consideration and that a thorough decision-making process is covered, HCC is proposing to undertake a more detailed assessment of EDL as a means of further considering this investment, via this assessment.

Process

The following areas have been investigated and considered:

- Financial Health
- Asset Ownership
- Legal and organisational structure
- EDL's business / commercial model
- Reputation within industry and other stakeholders, such as MfE
- Regulatory compliance history
- Health and safety history
- Environmental impact history
- Supply chain integrity
- General operational, including staff and HR policies
- Other matters of interest.

EDL is not a public company and much of this information is not readily available, or accessible in the public domain and will therefore rely on information provided by EDL and its associates.

COMPANY LEGAL STRUCTURE

Company number: 6696153
 NZBN: 9429046586612
 Incorporation Date: 21 Feb. 2018
 Company Status: Registered
 Entity type: NZ Limited Company
 Constitution filed: No
 Annual Return Filing Month: February, last filed 15 February 2025

Ultimate holding company: No

Company addresses:

Registered Office
 Unit 1, 22 Highgate Parkway, Silverdale, Silverdale, 0932 ,
 New Zealand

Address for service:

Unit 1, 22 Highgate Parkway, Silverdale, Silverdale, 0932 ,
 New Zealand

Directors

s7(2)(a)

Appointed: 21 February 2018

s7(2)(a)

Appointed: 6 February 2020

Website: www.edl-tech.com

Industry: M696220 Environmental Consultancy Service – excluding
 laboratory service

Shares: 100
 Held by s7(2)(a)

Environmental Decontamination (NZ) Ltd is a privately held company and therefore not required to declare or publish financial information or accounting reports.

As a privately held entity, EDL is also not required to prepare and have validated by a third party auditor, audited accounts.

THE TRIAL AND BENEFITS TO COUNCIL

History

As noted, since late 2023, EDL and HCC have worked collaboratively towards a 6-month trial of groundbreaking technology to decontaminate asbestos and asbestos containing materials (ACMs). This work was predicated on funding from the UK Nuclear Decommissioning Agency.

However, in early 2025, EDL advised that funding from the UK Nuclear Decommissioning Agency had been withdrawn for the trial due to cost-cutting measures instigated by the UK government.

The Proposed Investment

Council is considering covering the funding shortfall left the UK government. This would be to the extent of a one-off funding grant of NZD365,000 to EDL to be funded from Council's waste levy funds.

Benefits to Council and Wider City

The patented mechanochemical process that underpins EDL's technology has been independently validated by world-class laboratories and this trial of a practical application of the technology in a controlled environment is the precursor to the establishment of an industrial plant capable of processing commercial tonnages of asbestos and ACMs, ideally based at Silverstream Landfill.

To date the trial has reportedly cost EDL and the UK government approximately NZD5 million to develop, build and test the required plant for the trial.

An option now is for HCC to fund the shortfall of NZD365,000 for the trial.

This financial contribution is in conjunction to supplying landfill area and facilities and would result in HCC becoming effectively a partner in the arrangement with the benefit of accessing the outputs and outcomes from the trial, in addition to Public Relations opportunities to support the position that Council actively supports science, technology and innovation in Lower Hutt, along with being a leader in the demonstration of a circular economy.

EDL have indicated that a successful trial would lead to the planning of an industrial plant in Lower Hutt, assumed to be located at or near the Silverstream Landfill.

Council has prepared and proposed the following benefits-table:

Waste Stream	Potential Council Benefit	Potential City Benefit
Asbestos ACM	Reallocation of existing and future landfill airspace to residual waste. Reduced/delayed landfill development costs. National and potentially international interest in the technology and installation. Economic opportunity for Council to increase revenue by charging gate rates for waste that may have been disposed of at alternative sites.	Opportunity for Lower Hutt to have a world-leading asbestos/ACM treatment plant. Opportunities for economic growth, job creation and education. Promotion of Lower Hutt as the "centre of STEM excellence" in the Wellington Region as per the Wellington Region Economic Development Strategy.
POPs, PFAS etc. contaminated soils & materials.	Conservation of landfill airspace as potentially divertible output created through EDL process. National and potentially international interest in the technology and installation. Economic opportunity for Council to increase revenue by charging gate rates for waste that may have been disposed of at alternative sites.	Opportunity for Lower Hutt to have a world-leading asbestos/ACM treatment plant. Opportunities for economic growth, job creation and education. Promotion of Lower Hutt as the "centre of STEM excellence" in the Wellington Region as per the Wellington Region Economic Development Strategy. Proven technology that enables/facilitates regional infrastructure projects involving POPs, PFAS contaminated land. Less pollution (i.e. PFAS) being discharged to waterways if landfill leachate treated by EDL process.

The benefits to HCC and Lower Hutt City, generally, would be considerable in terms of waste treatment, landfill capacity and general waste reduction, if the trial went ahead, was successful and an industrial plant was to be built at Silverstream Landfill. This technology can be reconfigured to address the issue of POPs and PFAS contamination too, and therefore with even greater environmental benefits.

However, NZD365,000 represents a contribution of waste levy funds and it is prudent that Council undertake due diligence on EDL to ensure that reputational, financial and operational risk to Council is minimised.

Funding

Environmental Decontamination (NZ) Limited (EDL) is a privately owned company operated by Marcus Glucina (Chief Executive Officer) and Kapish Gobindlal (Chief Technical Officer). EDL's model is based around solving complex waste problems for customers through research and development, or the supply of the Mechanochemical Destruction (MCD) machinery in pilot and full-scale systems.

s7(2)(b)(ii)



In addition to partnering with local universities, EDL's technology is reported in a number of leading international publications including:

1. **US EPA Interim Guidance Report on the Destruction and Disposal of PFAS.** The US EPA released its 2024 update on the destruction and disposal of PFAS. The report outlines current technologies for managing PFAS, including ball milling. EPA scientists partnered with EDL to conduct a case study on mechanochemical degradation of PFAS. This is an official USA Federal guidance document that shows the potential of EDL's ball milling expertise. (See pages 2, 116, 119, 127).
2. **Concawe Report: PFAS Soil Treatment Processes – A Review of Operating Ranges and Constraints.** EDL contributed to the EU-commissioned CONCAWE report, highlighting its use of ball milling as a destruction technique for PFAS, amongst other POPs. (See pages 84-89).
3. **KLB Report about Asbestos Treatment Technologies.** A third-party assessment of EDL technology was included in the Dutch Government-commissioned KLB report entitled "On the lookout for practical sustainable options for asbestos waste treatment". (See pages 61-63 and other relevant references by searching MCD / mechanical treatment).
4. **Dioxin Treatment Trial in Vietnam.** In 2012 EDL successfully completed a UNDP-funded technology trial at the Bien Hoa airbase in Vietnam. This trial included the treatment of dioxin-contaminated soil with an average PCDD concentration of 30,000 ppt TEQ (range 5,000 ppt TEQ - 120,000 ppt TEQ). Noted is the independent report validating EDL's MCD technology and recommending it for deployment in addressing Agent Orange legacy issues in soils and other international projects with PCDD/F contamination. (See pages 57-73). The outcomes of the 2012 demonstration were also included in the recent USAID-commissioned Environmental Assessment for Bien Hoa, dated 3 May 2016.
5. **Meeting UN Sustainability goals.** EDL and their published papers are also cited in a recent paper discussing the application of mechanochemistry to meet UN Sustainability Goals. (See page 11).

These third-party reports appear to validate and endorse the technology and indicate EDL as the only, or a limited number of, companies providing it. Internationally, EDL has filed several patents and is the owner of the trademarks EDL and MCD in the USA and throughout Europe.

Taxation and Debt

The company advises that it is current with all tax obligations and has no external debt.

Health & Safety and Environmental Record

There are no known or stated Health and Safety or environmental breaches.

EDL advise that they have recently received local authority consent to handle up to 10 tonnes of toxic wastes at its Auckland facility.

Staffing

EDL currently employs eight (8) staff in New Zealand and is looking to increase this to eleven (11) over the next few months.

EDL PROJECTS

Mechanochemical Destruction (MCD) features a high efficiency ball milling system, engineered to treat toxic wastes and transform raw materials into value products.

MCD is noted as being an effective alternative to conventional destruction and remediation treatment processes by exploiting mechanochemical reactions. High energy ball milling is used to destroy persistent organic contaminants, transform asbestos into non-asbestiform solids, and efficiently pulverise raw materials into powders for industrial use.

The stated advantages of MDC include:

- Continuous and modular system capable of operating at an industrial scale.
- Process by-products for POPs, PFAS, and asbestos are inert with reuse potential.
- Non-thermal technology with no requisite for harmful additives or solvents.
- Highly adaptable and deployable technological solution.

PFAS (Perfluoroalkyl Substances)

Funded by the Department of Defence, EDL is investigating the effectiveness of MCD for remediating PFAS-contaminated soil. The project aims to validate MCD scalability and effectiveness for treating PFAS laden soils.

Mussel Shell Valourisation

Through successful pilot trials, supported by the NZ Ministry for Primary Industries, EDL has demonstrated that mussel shells can be converted into high purity calcium carbonate powders which have numerous applications across industry.

Asbestos

For asbestos fibres subjected to MCD conditions, EDL has shown at scale that mechanical milling leads to material fracture and fibre destruction. The end product of this process is an inert powder that is amenable to reuse for construction applications such as roading.

Further project and technical information relative to these projects can be accessed via the EDL website at www.edl-tech.com

Government References

Government partners and parties will be reluctant to provide direct references for technology based, or other, entities to endorse their expertise or systems. In terms of the mussel shell to Calcium Carbonate process, MPI have provided the following press release which provides information on the conversion process, the relationship between MPI and EDL, and the funding transfer between parties relative to the trial. As noted, this trial is now advancing to a state of full commercialisation.

INDUSTRY / GOVERNMENT REPUTATION

Ministry for Primary Industries (MPI) Press Release:

Grinding mussel shells into calcium carbonate offers high-value waste solution

Date: 07 February 2023

A New Zealand company has cracked a way to turn thousands of tonnes of mussel shells dumped each year into calcium carbonate, a high-value product used in a range of industrial products. Environmental Decontamination (NZ) Limited (EDL) is behind this breakthrough, with help from the Ministry for Primary Industries (MPI).

"In 2020 we partnered with EDL to develop mechanochemical technology to grind mussel shells into calcium carbonate powder," says Steve Penno, MPI's director of investment programmes.

"Calcium carbonate is a high-value ingredient that is in hot demand as it's used in a range of industrial products – from concrete and paint to paper.

"The trials have been a resounding success, and they've demonstrated that the technology can be scaled up."

EDL was granted \$313,000 from MPI's Sustainable Food and Fibre Futures fund to conduct pilot-scale trials. The company partnered with North Island Mussels Limited, who provided important market feedback and shells from their Tauranga facility.

Sustainable Food and Fibre Futures

"The technology offers an innovative solution to deal with the tonnes of mussel shells piling up," says Mr Penno.

"The only other way to produce calcium carbonate is through mining, so this new technology represents a massive step towards more sustainable options. It also provides a local supply of calcium carbonate at a time when supply chains are a challenge worldwide."

Dr Kapish Gobindlal, one of EDL's directors and its chief scientist, is leading the project.

"Currently New Zealand mussel shells are disposed of in landfill or used as fill material on farmland, but the shells are classed as biowaste," says Dr Gobindlal.

"We're now looking at building a facility that aquaculture companies can send their shells to, and there's potential to set up our grinding systems on site at mussel processing plants across the country as well."

EDL already has interest from major aquaculture companies in New Zealand. Dr Gobindlal says several potential buyers of the end product are already involved in the project by testing and validating the technical properties of the calcium carbonate EDL is producing.

"Our testing and validation has confirmed that the technology we've developed produces high quality calcium carbonate, suitable for paint, construction, and other high value applications."

Dr Gobindlal says New Zealand currently processes approximately 100,000 tonnes of green-lipped mussels for export and domestic supply per annum. This generates around 55,000 tonnes of mussel shells requiring disposal.

"Our aquaculture industry is projected to grow from NZ\$600 million in 2019 to NZ\$3 billion by 2035 so the issue of mussel shell waste is only going to grow.

"We're pleased that this Sustainable Food and Fibre Futures funding has paid off – and we've proven that revenue can be generated from this waste stream."

"New Zealand's aquaculture sector aims to be the greenest in the world," says Steve Penno.

"This project helps realise the goals of the sector and Government's Fit for a Better World roadmap for the food and fibre sector, which aims to boost sustainability, productivity and jobs over 10 years. This includes a focus on turning waste streams into high-value products.

"This truly is Kiwi ingenuity at its best."

WASTE DISPOSAL LEVY: REQUIREMENTS FOR TERRITORIAL AUTHORITIES

A levy on each tonne of waste sent to landfills is collected from landfill operators.

Fifty percent of the levy collected by the Ministry for the Environment through the waste disposal levy is paid to territorial authorities (TAs) on a quarterly basis each year.

TAs must spend the levy money they receive to promote or achieve waste minimisation. This spending must be in accordance with their waste management and minimisation plans (WMMPs).

The amount of levy each TA receives is determined by the number of people in each district.

WMMPs prepared by each territorial authority set out how the levy will be used, either prescriptively or generally.

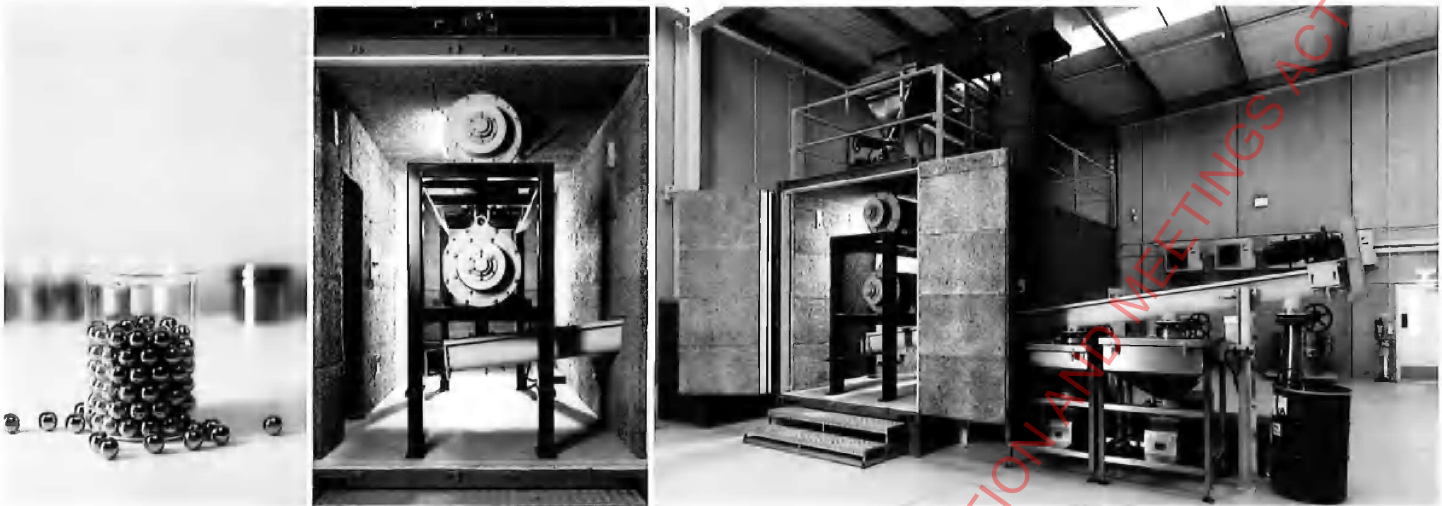
Essentially the Waste Levy is not designed to fund business as usual activities, but areas that demonstrate innovative and resourceful applications to reduce waste to landfill.

The application of Levy funds to a pilot project would seem logical and aligned with the Waste Act 2008 intent. Council has the ability to allocate funds to projects aimed at waste minimisation, and without the prior approval of the Ministry for the Environment as that intent is already encapsulated in the WMMP.

Based on the level of prior investment by EDL / UK Nuclear Decommissioning Agency, the marginal investment required of Council at NZD365,000 to prove, or even disprove, an application which has been tested at much smaller laboratory scale, and which would ultimately provide HCC with economic and environmental benefit, is to be encouraged.

EDL - Asbestos Pilot Cost Breakdown

Phases	High Level Cost Breakdown	Category	Total Budget	EDL Contribution	HCC Contribution
Asbestos Pilot Trial at Silverstream					
Project Planning	s7(2)(b)(ii)			s7(2)(b)(ii)	
Research Plan					
System Design					
System Fabrication / Assembly					
Asbestos Contractor					
Trial Management					
Laboratory Analysis					
Plant & Equipment					
Equipment Rental					
Shipping / Freight					
Expert Technology and Project Analysis and Reporting					
Total:			\$ 979,000.00	\$ 614,000.00	\$ 365,000.00



Asbestos Destruction Validation Project

Financial return to Hutt City Council (HCC)

Environmental Decontamination (NZ) Limited (EDL) is proposing a demonstration trial at Silverstream Landfill to treat asbestos and asbestos-containing materials (ACMs), with the possibility of including other materials (e.g., contaminated soils). The demonstration is designed to determine technology treatment capability at landfill-relevant throughput rates, providing a clear path toward commercial-scale deployment.

Following a recent meeting between HCC and EDL, Council requested a summary of potential commercial and financial return on investment opportunities for Hutt City Council, provided the demonstration is successful and results in a full-scale commercial plant at Silverstream. The following represents a set of possible approaches, or combination of approaches, to be finalised between HCC and EDL.

1. Return of Investment Capital

Once a full-scale commercial MCD facility is operating at the Silverstream site, HCC's initial contribution of \$365,000 could be repaid from revenues generated. This would be contingent on the successful completion and/or outcomes associated with (1) the practical demonstration at Silverstream Landfill, (2) financial & economic analysis, (3) attracting appropriate partners, (4) contractual development, and (5) requirements relating to the development of the said commercial MCD facility.

This option would ensure that HCC's upfront contribution of \$365,000 is repaid in full, according to an agreed schedule, through future MCD facility revenues. As the funding is considered a contribution, there would be no expectation for EDL to pay interest on the contribution.

2. Riverlink Project

The Alliance portion of the Riverlink Programme is expected to generate approximately 3,000 tonnes of soil impacted with asbestos, PFAS, and potentially other hazardous substances. Ordinarily, this soil would require disposal at a class 1 facility, with Silverstream being the closest and most appropriate facility for disposal. Disposal is charged at \$510 per tonne. Other disposal options may not be cost effective due to the transport costs involved, or relevant landfills may not be able to receive the waste for operational and / or consenting reasons.

At a full-scale commercial facility, processing costs are likely in the order of \$250 per tonne. This means that the cost to the Riverlink project could be significantly lower than disposal. Savings could be in the order of about \$750,000.

RELEASED UNDER THE LOCAL GOVERNMENT OFFICIAL INFORMATION AND MEETINGS ACT 1987

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Infrastructure and Regulatory Committee

10 February 2026

Report no: IARC2026/1/15

Quarterly report on the Silverstream Landfill and an update on solid waste management and minimisation infrastructure and services

1. The purpose of the report is to update the Committee on the development, operation and quarterly performance of Silverstream Landfill, along with the implementation of Council's Waste Management and Minimisation Plan 2023-29 (WMMP).
2. Under the Terms of Reference, the Infrastructure and Regulatory Committee oversees Silverstream Landfill and solid waste infrastructure, while the Connected Communities, Climate and Resilience Committee covers waste reduction and the WMMP. As this report relates only to landfill operations and does not seek policy or funding decisions, it is appropriate for this Committee to receive it while avoiding duplication with the Connected Communities, Climate and Resilience Committee.

Recommendation

That the Committee receives and notes the report.

Background

3. Officers provide regular reports on Council's work to manage the collection and disposal of solid waste, and its efforts to reduce waste, under the umbrella of Council's Waste Management and Minimisation Plan 2023-29.

Landfill

4. The landfill accepts a range of mixed waste for disposal. While three landfills in the Wellington region accept municipal waste, Silverstream is the only lined Class A landfill, which means it must meet various strict regulatory, siting, design and operational requirements.
5. The operation of the landfill is required to meet obligations under the Resource Management Act, the Hutt Valley Trade Waste Bylaw, the Climate Change Response Act and related legislation, the Waste Minimisation Act and relevant Council waste minimisation and climate change objectives.

6. The landfill also requires ongoing capital investment to create 'airspace' that can be used for the disposal of residual waste. Capital investment is staged to develop disposal capacity as required, with the timing periodically re-evaluated based on forward projections of the quantity of material accepted for disposal.

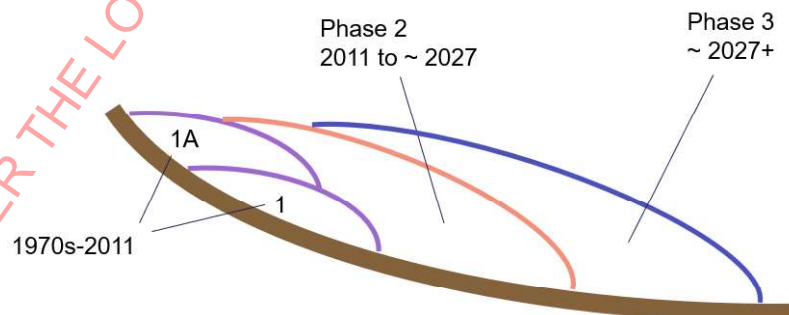
Waste minimisation

7. The Wellington Region Waste Management and Minimisation Plan 2023-2029 (WMMP), a statutory plan, outlines how the Wellington region's eight councils are working with mana whenua, our communities, and the waste industry to transform how we generate, manage, and minimise waste.
8. The WMMP addresses the key issues identified in the region's waste assessment and includes a shared vision, objectives, policies, and methods. It includes a regional action plan and local action plans specific to each participating territorial authority.
9. A Wellington Region Waste Management and Minimisation Plan Joint Committee (the Joint Committee), hosted by Porirua City Council, oversees the implementation of the WMMP, with operational delivery of the regional action plan led by the WMMP Steering Group, consisting of the officers leading the solid waste and minimisation portfolio at their council.
10. The implementation of the local action plans is the responsibility of each respective council.

Landfill

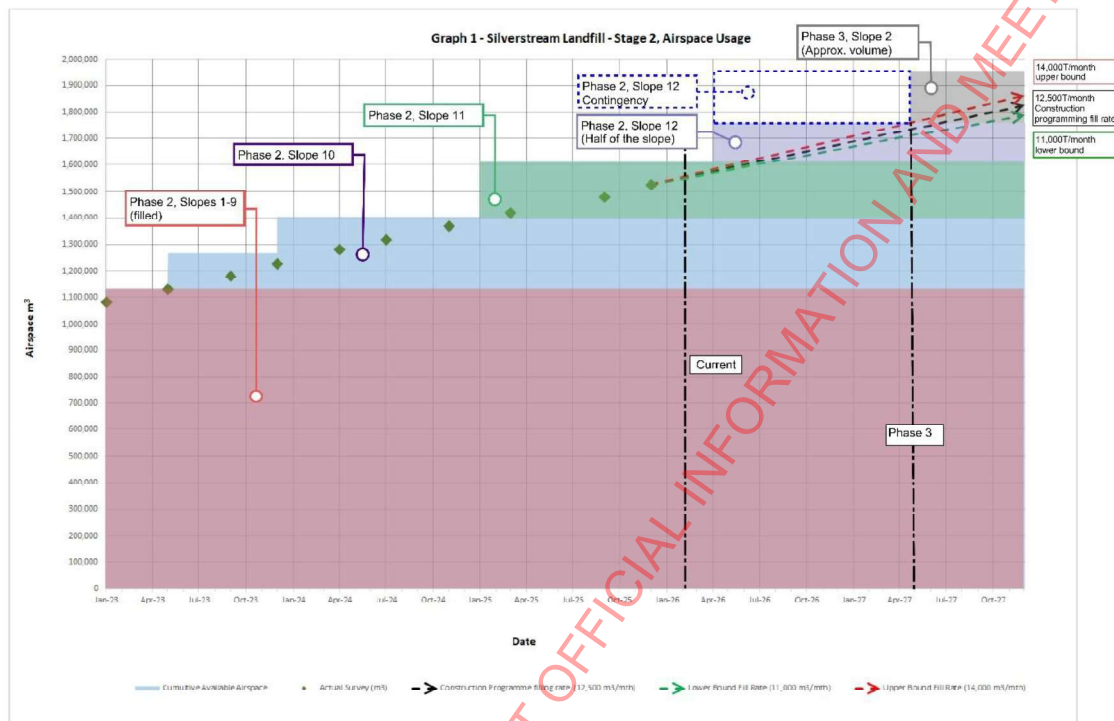
Development and construction

11. Construction work in relation to the new Phase 3 of the landfill is currently progressing, with ~\$11M in capital expenditure during 2025/26.
12. Filling of Phase 3 is scheduled to begin in 2027 from the new toe bund at the base of the gully and move up to meet Phase 2. The landfill's construction phases are shown below.



13. The figure below shows the air space usage for Silverstream landfill in relation to the planned completion of new slopes and the new Phase 3.

Figure 1: Air space utilisation at Silverstream Landfill



14. The photo below shows the base of the new Phase 3, with the lower (filled) slopes of Phase 2 in the background.

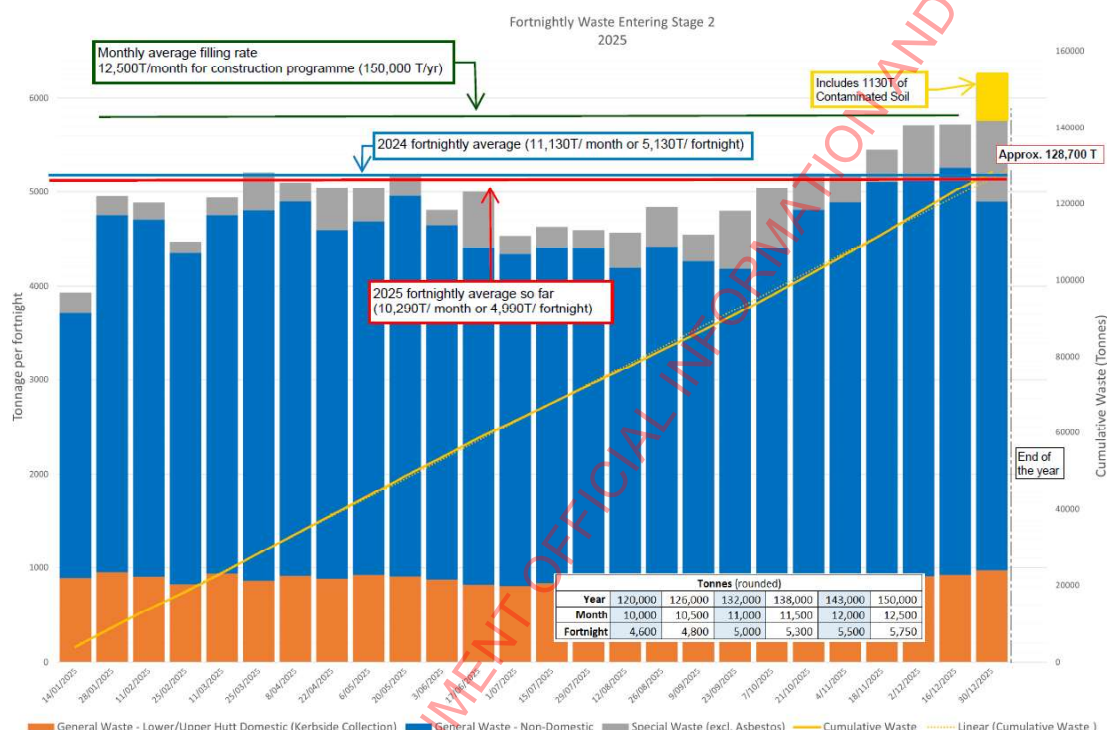
Image 1: Construction works for the new Phase 3



Waste volumes

15. The amount of waste deposited increased in the last two months of 2025 (see graph below). However, overall waste volumes continue to be subdued, compared to the original volume assumption of 150,000t per annum used for budgeting purposes. This is likely because of continued lower than expected economic activity, including in the development and construction sector.

Figure 2: Fortnightly waste volumes



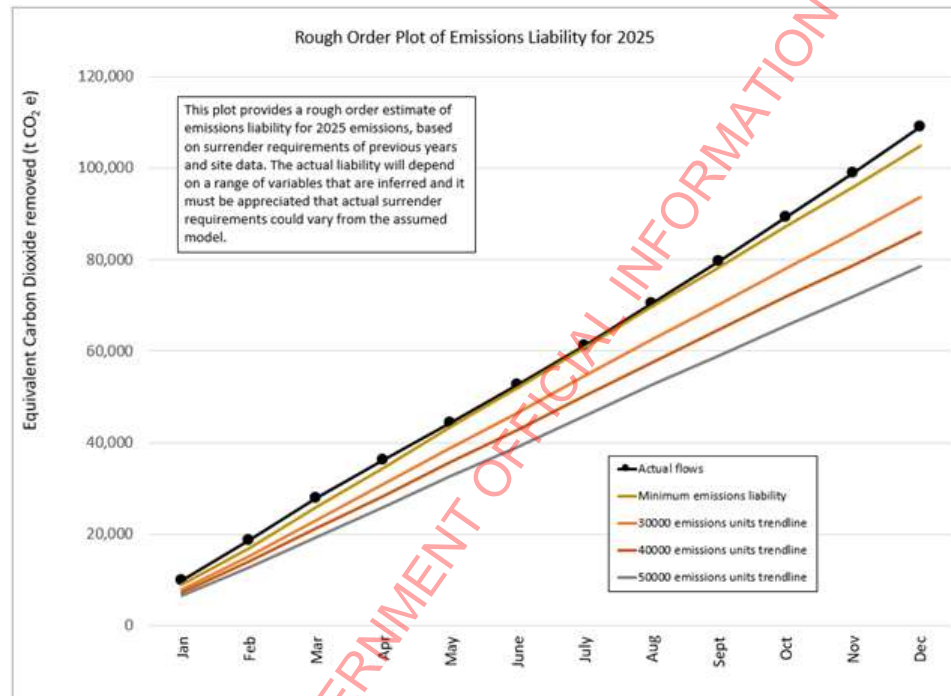
Health and safety

16. For the period between July and December 2025, there were no significant health and safety incidents resulting in injuries or work time lost.
17. However, there was one significant near miss in December 2025, which was caused by an external contractor not following the agreed-upon processes and safety procedures when mulching green waste. The incident was reviewed, and the root causes identified.
18. Waste Management NZ has since been working with the external contractor to implement a range of corrective actions, including updates to the contractor's Health and Safety Plan and associated procedures, staff of the external contractor re-completing site inductions, and the WM supervisor confirming all requirements are met each time before the mulching operations are permitted to be undertaken.

Greenhouse gas emissions from waste disposal

19. LMS owns and operates the power plant and supplementary flare. Council monitors the effectiveness of LMS's performance in relation to Council's emissions liability under the NZ Emissions Trading Scheme (ETS). High effectiveness of gas extraction and destruction ensures that Council can minimise emissions and its liability under the ETS.
20. For 2025, the landfill achieved the minimum liability under the NZ ETS, as shown below.

Figure 3: ETS liability monitoring



21. The performance during January 2025 was also in line with Council's objectives to minimise emissions.

Environmental performance

22. A summary of environmental performance for July to September 2025, and for October to December 2025, is shown in Appendices 1 and 2, respectively.
23. The summary references management trigger levels being exceeded, which require investigation or mitigation measures to be undertaken as part of an adaptive management approach. Overall, the landfill remained compliant with its consent conditions.
24. Sediment control remains a major challenge due to the amount of construction work under way and the resulting ground disturbance.

Remediation of borrow areas

25. Borrow areas at the landfill are designated excavation sites for sourcing soil used for cover material and landfill construction.
26. Hutt City has a plan in place to remediate borrow areas where soil has been exhausted. Appendix 3 shows the location of borrow areas, and the approximate timing of remediation.
27. During 2025, two ex-borrow areas were remediated: a section of the former W0 borrow area, and the former Eastern Borrow. The photos below show the replanted sites at the time of planting in winter and spring 2025.
28. In the context of the successful biosolids trial completed in 2025, Council also applied for consent to apply dried biosolids prior to replanting, and to assist with plant growth. This was done as part of the Eastern Borrow remediation. While the amount of biosolids is relatively limited (about 10 t per ha), it is expected to boost plant growth rates significantly.

Image 2: Remediated W0 borrow area – looking North (winter 2025)



Image 3: Remediated Eastern Borrow – looking West (spring 2025)



29. Site inspections were undertaken on 2 February 2026. This shows that both planting sites have successfully established with a high rate of plant survival.
30. Importantly, as shown in Appendix 4, the former Eastern Borrow that was treated with biosolids shows more vigorous plant growth compared to the other site that was not treated with biosolids. This is despite planting in the Eastern Borrow occurring about three months after the W0 Borrow area.

Spicer landfill in Porirua

31. Porirua City Council is undertaking [public consultation on the future of Spicer Landfill](#). All four options involve closing the landfill for municipal waste, although one option would keep the site open for the disposal of clean fill and inert material such as soils, clays, rocks, and gravel – materials that are not hazardous or that create odour.
32. The council intends to make final decisions as part of the Long Term Plan consultation in 2027.
33. All options have implications for Silverstream landfill in that at least some of the waste currently destined for Spicer may come to Silverstream. It may increase the volume received at Silverstream landfill by about 30-40,000t per annum (or about 25%), from about 2031.

Waste minimisation

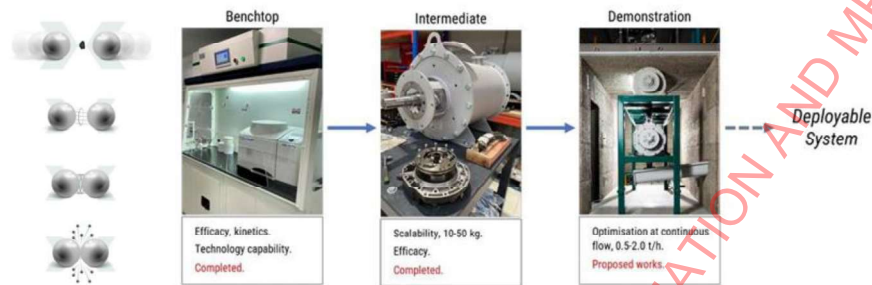
34. Appendix 5 shows the updated portfolio dashboard to implement the WMMP 2023-29, including both projects and business as usual work. Where relevant, updates are also provided for those regional projects led by Council officers.
35. Several projects or activities are highlighted in further detail below, where significant milestones have recently been met or are upcoming.

Asbestos destruction demonstration

36. Environmental Decontamination New Zealand Ltd (EDL) is a New Zealand owned and operated research & development company based in Auckland. The company has developed innovative technology to convert asbestos and asbestos containing materials (ACMs) into an inert amorphous powder. Technology utilises the mechanical energy of high-velocity ball bearings within specialised reactors, see figure below. The end product could then be reused as a filler in industrial applications.

37. The technology has been validated via world class laboratories and field experiments conducted in New Zealand and other countries. However, a practical demonstration of the technology in an operational environment, such as a working landfill, is required to pave the way towards commercialisation.

Image 4: Technology concept, and the completed and proposed works for testing and demonstrating EDL's asbestos destruction technology



38. As previously reported, the proposed demonstration was originally scheduled to be undertaken in early 2025, but funding withdrawal by an overseas agency resulted in EDL suspending the practical demonstration. The funding shortfall was resolved in late 2025, and EDL are currently fabricating the specific plant and equipment for the demonstration, with delivery to Silverstream scheduled for early to mid-2026.

Development of a soil and aggregate recovery facility

39. As previously reported, Council and Fulton Hogan have been in discussions to develop a soil and aggregate recycling facility (SARF) that would be located at Silverstream Landfill. This facility would be a New Zealand first and would help reduce the volume of contaminated soil and rock requiring disposal.
40. Fulton Hogan has recently submitted a funding application to the Ministry for the Environment's Waste Minimisation Fund to seek co-funding for the upfront investment required for the project. The outcome of this is not yet known.
41. As the project will involve the long-term lease of public land to a private operator, Council will need to consider their application to lease the proposed SARF site within the landfill precinct prior to the project going ahead.

Image 5: Impression of the proposed SARF at the Silverstream Landfill, near the existing transfer station



Silverstream Zero Waste Hub improvements

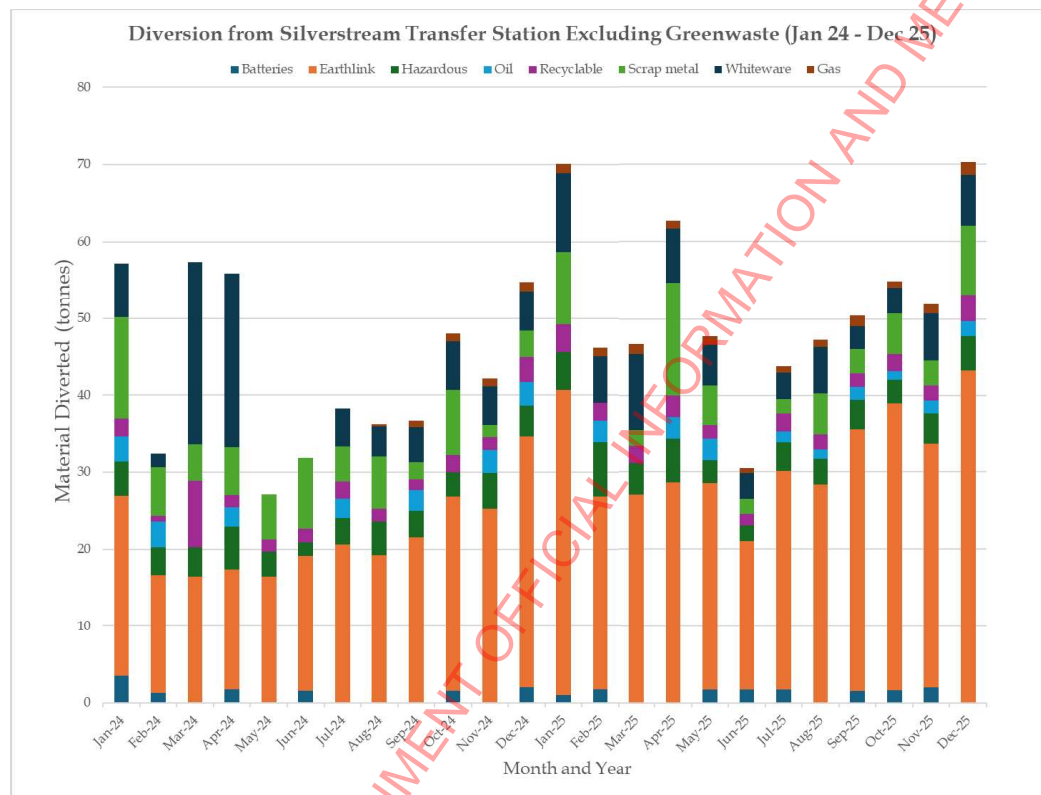
42. Various waste diversion and resource recovery activities take place at the Silverstream transfer station and Zero Waste Hub. Waste streams targeted for diversion include (but are not limited to) green waste, whiteware, metals, cardboard, glass bottles, batteries, gas bottles, waste oil, various other hazardous products (eg corrosive acids, paints, chemicals, etc), e-waste, and various reusable or repairable products and bric-a-brac, such as furniture.
43. Some changes have been implemented to improve traffic flow, customer visibility and access to resource recovery areas. The updated layout provides dedicated spaces for additional material streams (tyres, plate glass and native timber), enabling new and expanded resource recovery options.
44. As part of this, signage has been upgraded to support correct material separation and increase uptake of diversion incentives (see images below).

Image 6: New Zero Waste Hub signs



45. The steady upward trend in diversion has continued since the start of the discount voucher scheme and changes to the engagement model, and 3,366 tonnes were diverted from the landfill (across all material types) during 2025. The figure below excludes the diversion of green waste, which is in the order of about 200t per month.

Figure 4: Diversion (excluding green waste) from transfer station 24-25



Clean up the Hutt

46. More than 300 people took part in Clean Up the Hutt on Saturday 13 December 2025, collecting more than 2.5 tonnes of rubbish and recycling across Lower Hutt's rivers, coastline and open spaces – both above and below water. This event was supported by Council and organised by Sustainable Coastlines in association with Conservation Volunteers New Zealand. Numerous business sponsors also contributed to the event, making it a success.
47. Participants worked across a range of locations from family-friendly sites in Wainuiomata and Eastbourne, to more challenging terrain at Burdan's Gate and towards the Eastbourne lighthouse.
48. The clean-up also included expert divers and barges working around Matiu Somes Island and off the Eastbourne coast, helping remove larger items from the marine environment. Private contractors also contributed and had staff undertake clean-ups of streams and waterways across Wainuiomata. Participants also came together at Petone Beach to celebrate the collective effort and impact made.

Battery recycling

49. Battery collection units were successfully trialed at War Memorial Library, Naenae Library, and Eastbourne Library. The trial and the units' creative design have been well received, with staff reporting strong community engagement and positive feedback. Notably, at Naenae Library the new collection units have attracted visitors that had not visited the library in years.
50. Following this success, additional collection units will be rolled out at four locations in Q4 of 2025/26.

Kerbside collection service

Processing infrastructure

51. Material collected by Council's kerbside recycling service is processed at a Materials Recovery Facility (MRF) in Seaview, Lower Hutt. In December 2025, the ownership of the plant changed. Whereas previously the plant was owned by OJI Fibre Solutions, it is now owned by Capital Recycling, a joint venture between Waste Management NZ and Northland Waste.
52. Processing of Council's recycling material continues as normal, albeit Capital Recycling has flagged that they will be looking at new investments at the plant (e.g. improved equipment).

Food and green organics (FOGO)

53. Wellington City Council and Council have been collaborating on a joint process to procure a processing solution for food and green organic waste. The final Request for Proposal stage of the procurement commenced in October 2025. The tender closed in December 2025, and a panel has been evaluating the tender responses.
54. The panel's recommendations are imminent, and this will inform Council's decision in 2026 on whether to implement the proposed service.

Contamination reduction

55. Work continues with behaviour change agency EightyOne to support targeted engagement and refreshed use of existing assets and graphics from previous contamination reduction campaigns. For example, a targeted media campaign was rolled out over the summer period using existing assets, with a focus on problem materials such as food waste and soft plastics. This campaign used out-of-home billboards (eg bus shelters), digital billboards across the city, posters near dairies, social media and retail media (eg pizza outlets).

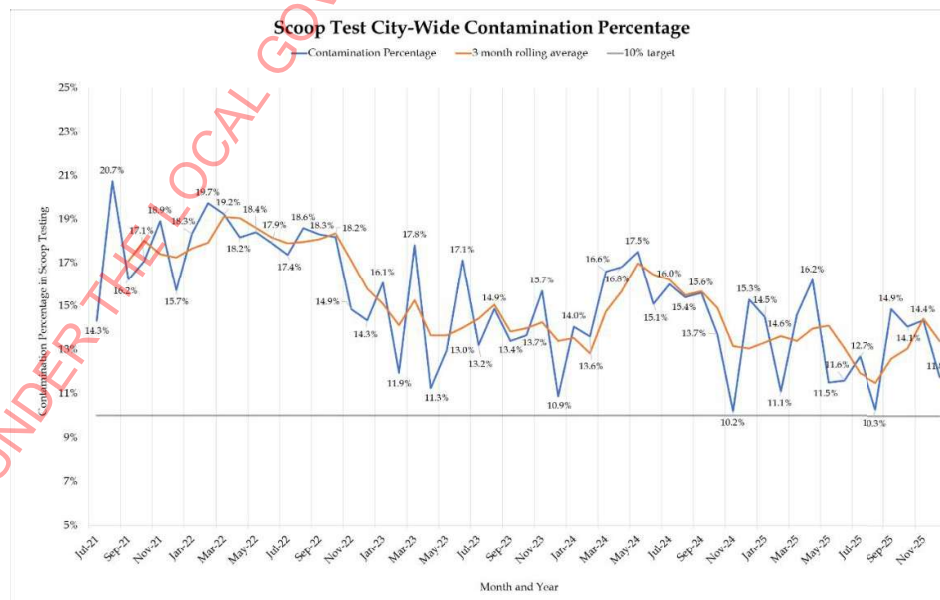
56. New bin lid stickers (shown below) are also now available for use by WM New Zealand for new bin rollouts and second red sticker households for a trial of in-situ reminders on what can (or cannot) go in the yellow-lid bins.

Image 7: Additional bin stickers for education



57. Other work underway includes the production of a kerbside FAQ asset for use by property managers, hubs and library staff, and engagement with local supermarkets and retailers for reminders on how to recycle commonly purchased items at the point of sale.
58. Despite Council's contamination reduction programme, the three-monthly average contamination rate tracked up towards the end of the year (see figure below) but decreased again in December 2025 and remains under the 15% mark, above which additional penalties apply for Council.

Figure 5: Monthly scoop test results July 2021 – December 2025



Awa chatbot and calendars

59. A new AI chatbot was added to the Too Good to Waste website in November 2025 to help residents to quickly and easily find rubbish and recycling bin information 24/7. 1,030 queries have been fielded since launch and since the functionality to look up collection days was added in mid-December this has been the dominant query coming in.
60. The rubbish and recycling calendars for 2026 are available to download for the relevant address zone at Too Good to Waste and copies are also available at local neighbourhood hubs for collection.

Climate Change Impacts and Considerations

61. Minimising waste, diverting recyclables from landfill, and recovering reusable materials (such as the potential addition of C&D diversion opportunities, diverting biosolids, etc) contribute to a more circular economy. These activities reduce the need to extract further resources from the environment and the associated energy use.
62. To help achieve a reduction in operational emissions at the landfill, Council's operational and capital works contracts include emission reporting and reduction requirements, for both Waste Management NZ and Leach & Co Ltd. In addition, a Heavy EV Charging Hub is in place, to enable the electrification of on-site machinery and/or vehicles. Both contractors now operate some electric vehicles on site, including a 20t electric loader operated by Waste management NZ.
63. Regarding emissions from the landfill itself (methane), a powerplant and supplementary flare operated by LMS are in place to destroy methane and emissions as much as possible.

Consultation

64. There is no consultation required.

Legal Considerations

65. The Government confirmed in mid-December 2025 that new legislation is planned to regulate the management of waste and litter (replacing the current Waste Minimisation Act 2008 and Litter Act 1979).
66. Consultation was undertaken in April and May 2025 and the Hutt City Council submission is available in the papers for the Climate Change and Sustainability Committee on 2 July 2025 (page 31). Once the draft legislation is released, officers will provide further analysis and advice.

Financial Considerations

67. There are no financial considerations currently.

Appendices

No.	Title	Page
1	Appendix 1 - Environmental performance dashboard Jul-Sep 2025	119
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3	Appendix 3 - Location of borrow areas at Silverstream landfill	121
4	Appendix 4 - Plant growth comparison	122
5	Appendix 5 - HCC WMMP Action Plan Dashboard	125

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Approved By: Jarred Griffiths
Director Strategy and Engagement

Silverstream Environmental Quarterly Report for the Hutt Valley Services Committee (July to September 2025)



Monitoring effort during the quarter

Number of samples taken, or surveys and assessments completed

Gas surveys - 6

Groundwater samples - 15

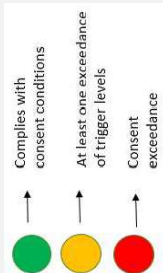
Surface water samples - 12

Surface water visual assessments - 12

Leachate measurements - 2 (Flow monitored 24/7)

Refer to individual sections for detailed information on any exceedances.

Legend



Leachate

Leachate quality results:

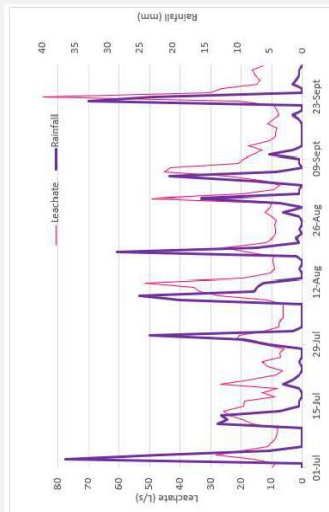
There were no exceedances of leachate trade waste conditions.

Leachate flow volume (m3) to Seaview Wastewater treatment plant:

July	August	September
38501	40794	42864.23

Daily leachate flow and rainfall

Total rainfall = 502.5 mm



Water

Groundwater monitoring locations



Groundwater analysis

Ten exceedances were recorded for ground water quality parameters in the quarter. These were investigated and found to be unlikely to be related to leachate contamination from the Landfill.

Surface water monitoring locations



Surface water analysis

Samples are collected and analysed monthly for contaminants outlined in the discharge to surface water consent. In May there were several exceedances of consented surface water quality parameters in the quarter. In response, outflow of the surface water system was redirected into the wastewater system throughout the quarter. It was redirected back into the surface water in September, after leachate breakouts on the landfill were repaired, and testing showed that water quality had returned to within consent limits.

Visual surface water assessments are also carried out monthly and no exceedances were noted in the quarter.

Tip stream (downstream of the landfill, SW4) visual assessment

SW4 Observation	July	August	September
Water Clarity	Clear	Clear	Clear
Foam	No	No	No
Odour	No	No	No
Algae	No	No	No
Flow	Low	Low	Low

Gas

Surface gas results

There were 31 methane concentration exceedances at 100mm above the landfill surface in the quarter. Remediation at each location is carried out upon instruction by T+T.

Gas probe results

No methane exceedances (>5% CH4 by volume) for either of the two probes located outside the landfill footprint.

Gas collected

Parameter	Unit	July - September
Gas flow rate	m3/hr	1179
Methane concentration	%	47

Odour

Months	July	August	September
Complaints	1	1	0
Total in Quarter	2	2	0

Investigation indicates that the complaint in July relates to a gas engine being turned off for maintenance, coinciding with low wind speeds and direction towards the notifiers. The complaint in August relates to very low wind speeds causing odour to linger and the wind direction causing the odour to travel towards the notifier. Slightly reduced gas destruction at this time may also have been a factor.

Known locations of complaints



Silverstream Environmental Quarterly Report for the Hutt Valley Services Committee (October to December 2025)

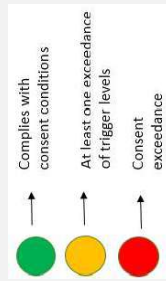


Monitoring effort during the quarter

Number of samples taken, or surveys and assessments completed

- Gas surveys - 5
 - Groundwater samples - 14
 - Surface water visual assessments - 12
 - Surface water samples - 12
 - Leachate measurements - 1 (Flow monitored 24/7)
- Refer to individual sections for detailed information on any exceedances.

Legend



Leachate

Leachate quality results:

There were no exceedances of leachate trade waste conditions.

Leachate flow volume (m3) to Seaview Wastewater treatment plant:

October	November	December
81021.6	82462.6	51271.37

Daily leachate flow and rainfall

Total rainfall = 364.8 mm



Water

Groundwater monitoring locations



Groundwater analysis

Three exceedances were recorded for ground water quality parameters in the quarter. These were investigated and found to be unlikely to be related to leachate contamination from the Landfill.

Surface water monitoring locations



Surface water analysis

Samples are collected and analysed monthly for contaminants outlined in the discharge to surface water consents. No surface water quality parameters exceeded in October or November. In December there was an exceedance of pH at SW2A. The likely cause of this does not appear to be related to leachate at the landfill. There were no pH exceedances recorded in the most recent monitoring round in January 2026.

Tip stream (downstream of the landfill, SW4) visual assessment

SW4 Observation	October	November	December
Water Clarity	Clear	Clear	Clear
Foam	No	No	No
Odour	No	No	No
Algae	No	No	No
Flow	Low	Low	Low

Gas

Surface gas results

There were 26 methane concentration exceedances at 100mm above the landfill surface in the quarter. Remediation at each location is carried out upon instruction by I+T.

Gas probe results

No methane exceedances (>5% CH4 by volume) for either of the two probes located outside the landfill footprint.

Gas collected

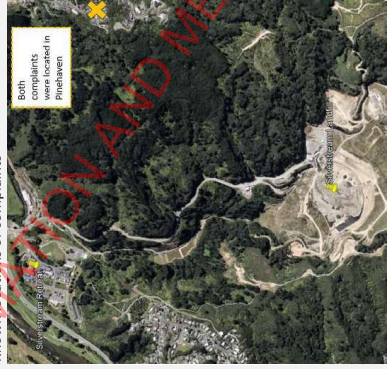
Parameter	Unit	October - December
Gas flow rate	m3/hr	1238
Methane concentration	%	48

Odour

Months	October	November	December
Complaints	0	1	1
Total in Quarter	2		

Investigation indicates that both the November and December complaints were not attributable to the Landfill, as the notifier was not downwind of the Landfill.

Known locations of complaints











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Appendix 1. WMMP Local Action Plan Portfolio summary (WMMP 2023- 2029)

This dashboard provides an overview of Hutt City Council's Waste Management and Minimisation Plan (WMMP) work programme, showing the current portfolio of projects and business-as-usual activities planned and underway to deliver local and regional WMMP actions. In total, 26 projects are planned to support delivery of the Local Action Plan (LAP) actions, with 22 currently underway. A further eight activities are delivered on an ongoing business-as-usual basis

Project Name	LAP action(s)	Regional/Local?	Stage	Project Description	Project impact	Project update
Infrastructure						
EV Charging Hub and landfill electrification	20	Local Project	Completed	Install EV Charging Hub for heavy vehicles and machinery at the Silverstream Landfill.	High Weight	Construction of the Heavy EV Charging Hub was completed in 2025, and the hub was officially opened on 3 February 2026. WM is now operating a 20t electric loader on site, and a further two kerbside trucks utilise the hub daily for overnight charging. A further two EV charger satellites are due to be installed by April 2026, to enable charging of an additional two kerbside trucks. Officers are working with WM to consider the next tranche of on-site machinery and/or vehicles due for electrification.
EDL asbestos destruction demonstration (soil remediation)	11	Local Project	In progress	Trial Environmental Decontamination Limited's (DEL) technology to neutralise asbestos including soils contaminated with asbestos, to improve safe handling outcomes, preserve landfill airspace, and recover resources.	High Weight	The HCC Chief Executive approved a funding contribution to enable the asbestos destruction practical demonstration in late 2025. A contract has since been signed with EDL, and delivery of the demonstration plant & equipment to Silverstream is expected by late Feb 2026. In the meantime, the resource recovery team is working with T+T and WMNZ to prepare the site.
Soil and aggregate recycling facility	11	Local Project	In progress	Work with partners to implement a soil and aggregate recycling facility (SARF) at Silverstream Landfill, supporting local circular economy outcomes, preserving landfill airspace, and reducing reliance on virgin materials.	High Weight	FH has submitted an application to the Ministry for the Environment's Waste Minimisation Fund for co-funding for the SARF. The HCC Chief Executive has approved support for FH's application and for HCC officers to negotiate commercial arrangements with FH, subject to the MFE funding application being approved.
Site remediation	21	Local Project	In progress	Identify and implement remediation options for closed landfills to manage legacy environmental risks.	Low Weight	A consent application is still under development, for remediation work at the closed Eastbourne landfill (eg top up cap, repair drains, etc). The application is scheduled to be submitted to Greater Wellington Regional Council by April 2026. Remediation work is tentatively scheduled for the 2026/27 construction season, pending consent confirmation, and finalising costs and budgets.
Resource Recovery infrastructure development (additional zero waste hub)	12	Local Project	Not started	Evaluate options and potentially implement an additional resource recovery facility, partnering with existing providers to strengthen network capacity and expand local reuse and recovery services.	Low Weight	Not started.
Business Engagement						
Business engagement	4	Regionally Coordinated	Not started	Develop a business engagement plan consistent with agreed regional approach.	Medium Weight	Not started.
Business waste audits	4	Local Project	Not started	Deliver waste audits for participating businesses, with the aim of supporting businesses to identify practical opportunities to reduce waste and track progress over time.	Medium Weight	Not started.
It starts with us - Internal waste minimisation project	2	Local Project	On hold	Implement waste minimisation initiatives across council facilities to reduce waste, increase resource recovery, and demonstrate council leadership by walking our talk.	Low Weight	As part of the It Starts With Us project (organisational behaviour change), waste systems at the Laings Road administration building were improved in collaboration with the Facilities team. Improvements included new bins for additional waste streams, clearer signage to support correct disposal, and consolidation of several streams to simplify separation and improve diversion. The project is intended for wider rollout across HCC sites but is currently on hold while other projects are prioritised.
CBD single-use transition engagement	4	Local Project	On hold	Transition Lower Hutt CBD toward a 'single-use free' city by supporting local businesses to embed lasting waste minimisation practices.	Low Weight	The Single Use CBD project is currently on hold and is intended to be picked up again as a component of the Business Engagement project.
Embedding waste reduction in procurements	2, 3	Local Project	Planning	Implement a council-wide procurement policy that reduces waste across contracts and services, embedding circular economy principles into sourcing, delivery, and supplier expectations.	Low Weight	Planning is underway to embed waste reduction criteria into HCC's procurement policy, including ensuring future procurements align with the C&D Bylaw requirements.
Community Impact						
Clean up the Hutt event	5, 7	Local Project	Completed	Clean up the Hutt is a partner-led initiative that delivers litter clean up and waste minimisation events across multiple Lower Hutt suburbs.	Medium Weight	More than 300 people took part in Clean Up the Hutt on Saturday 13 December 2025, collecting over 2.5 tonnes of rubbish and recycling from rivers, coastline and open spaces across Lower Hutt, both above and below water. The event was supported by council and delivered by Sustainable Coastlines and Conservation Volunteers New Zealand, with contributions from business sponsors.

*Project Impact is calculated from a weighted formula that includes 'priority', 'diversion potential', 'reach', and 'budget'.

Project Name	LAP action(s)	Regional/Local?	Stage	Project Description	Project Impact	Project update
R3 Waste Forum	6, 8	Regional Project	In progress	Lead improvements to governance and enhance the Wellington region waste forum's effectiveness in communicating waste minimisation priorities and initiatives, while providing ongoing secretariat support.	Low Weight	The regional project to strengthen the Wellington Region Waste Forum is nearing completion and is awaiting endorsement of a revised Terms of Reference by the Joint Committee, and a potential forum name change. Following endorsement, the forum will transition to business as usual.
Tikanga Māori Initiative(s)	1	Local Project	In progress	Provide support to local iwi groups and/or other organisations that provide tikanga Māori perspectives on waste minimisation initiatives.	Low Weight	The Resource Recovery team is actively working with the Council's Kāhui Mana Whenua group to identify opportunities for partnership for Lower Hutt based Tikanga Māori initiatives related to circular economy.
Campaign: Behaviour Change	7	Local Project	On hold	Implement a city-wide waste minimisation campaign to drive behaviour change and improve community outcomes through coordinated engagement and education.	Medium Weight	Scoping was undertaken for a litter reduction campaign with the external behaviour change agency, but these did not meet expectations. Initial scoping is now being undertaken to develop a brief for a potential waste minimisation behaviour change campaign, which would then be progressed through an external behaviour change agency. On hold due to team capacity and prioritisation.
Community grant fund (waste minimisation)	5	Local Project	Planning	Establish a community waste minimisation grant fund for Lower Hutt to resource community/local-led projects that reduce waste, increase reuse and recovery, and deliver measurable outcomes.	Medium Weight	The community waste minimisation grant fund is currently being scoped, including defining objectives, eligibility criteria and funding level. Full development will commence after the TOM is implemented, with delivery options and resourcing requirements to be confirmed.
Evidence, Strategy and Planning						
C&D commercial solution	13	Local Project	Completed	Pilot a recovery solution for mixed commercial C&D waste loads at Silverstream Landfill, testing diversion pathways and operational logistics to inform a scalable long-term approach.	Medium Weight	The project has been completed. The project did not attain the objective of transporting between 5 and 10 hook bins of commingled C&D Waste to Central Environmental (Fielding) for diversion. However, the learnings from preparation and operational stages have been significant and highlight the barriers and challenges to diverting C&D waste in the Lower Hutt and the Wellington region.
SR3 Contaminated soil	12	Regional Project	In progress	Lead a regional investigation into the volumes, sources, contamination profiles, and current disposal pathways for contaminated soil, identifying system-wide opportunities to enable diversion from landfill.	Medium Weight	Scope has been finalised, and the next step is procurement to appoint an external provider to deliver the project, supported by participating councils.
Future of residual waste	11	Regional Project	Planning	Undertake an investigation to assess and future regional flow of waste and the current and future infrastructure and services required to manage known and future residual waste streams (including disposal alternatives). HCC leads this regional project.	High Weight	Data analysis and modelling are progressing, with planning underway to develop the business case for an options analysis and pathways and procure an external provider, supported at a regional level.
Policy						
Bylaw Implementation (C&D waste)	9	Regionally Coordinated	In progress	Implement the Construction and Demolition (C&D) provisions in the Waste Management and Minimisation bylaw 2021, requiring the submission of a Waste Management Plan for building projects valued over \$2M.	High Weight	HCC is leading regional coordination for C&D bylaw implementation, including development of a compliant Waste Minimisation Plan template, and aligned regional and local communications and engagement.
Bylaw implementation (minimising event waste)	9	Local Project	In progress	Implement the event provisions in the Solid Waste Minimisation and Management bylaw 2021, working with partners to support organisers with compliance, and lift waste minimisation standards for events in Hutt City.	Medium Weight	Following a successful trial of event waste minimisation and resource recovery support, procurement has been completed to secure a delivery partner for ongoing implementation of the event waste bylaw provisions. Nonstop Solutions has been appointed and contract negotiations are underway. The contract will expand support for large and small events across the city, building consistent capability among event organisers through education and practical guidance to improve waste reduction and resource recovery outcomes.
Bylaw review	9	Regionally Coordinated	Planning	Undertake a regionally coordinated statutory review of Council's Solid Waste Management and Minimisation Bylaw 2023-2029 to ensure it remains fit for purpose, aligned with regional priorities, and continues to provide an effective regulatory framework.	Medium Weight	Planned, subject to regional agreement on approach and timing.
Service Transformation						
FOGO kerbside collection and processing	14	Sub-regional Project	In progress	Plan and potentially implement a kerbside food and green organic waste (FOGO) service, including identifying and securing a fit-for-purpose processing solution.	High Weight	The final stage of the procurement process for a regional food and green organics (FOGO) processing solution commenced in October 2025. The tender closed in December 2025, and a panel has been evaluating the tender responses. A decision on the preferred respondent is expected by the end of Q3. This will inform Hutt City Council's decision in 2026 on whether to implement the proposed service.

Project Name	LAP action(s)	Regional/Local?	Stage	Project Description	Project impact	Project update
Kerbside -Contamination reduction	19	Local Project	In progress	Deliver a targeted campaign that reduces contamination, and improves the effectiveness of HCC's kerbside recycling collection service.	High Weight	A targeted media campaign was rolled out over the summer period using existing assets and focusing on problem materials such as food waste and soft plastics. An FAQ resource is at the production stage for use by property managers and will be made available through frontline community contacts. Bin lid stickers are in the final stage of development for new bin rollouts and second red sticker households for an in situ reminder on what can go in the yellow-lid bins. Next steps include engagement with local supermarkets and retailers on point-of-sale recycling reminders.
Battery Recycling	12	Local Project	In progress	Implementing battery recycling collection services in HCC hubs and libraries to improve access, increase recovery, and keep hazardous materials out of homes and landfill.	Low Weight	Battery collection units were successfully trialled at War Memorial, Naenae, and Eastbourne libraries. Following the successful trial, work is underway to roll out additional units at further sites by April 2026.
Silverstream resource recovery improvements	12, 20	Local Project	In progress	Improving the Silverstream Transfer Station layout and signage to improve site operations and expand waste stream diversion options.	Medium Weight	The Silverstream Transfer Station layout has been updated to improve traffic flow and customer access while enabling expanded resource recovery. New dedicated areas for additional material streams (plate glass, tyres, and native timber) support increased diversion to help preserve landfill airspace. Supporting signage has been produced and will be installed shortly to guide correct material separation and promote diversion incentives.

BAU				
Regional project contributions	6, 12	Regionally Coordinated	BAU	Provide or coordinate strategic input and technical expertise to support delivery of 18 regional VMMP initiatives led by HCC or partner councils, helping align projects and maximise shared outcomes. This includes for example, data alignment regionally and waste in emergencies planning.
Central government advocacy	10	Local Project	BAU	Coordinate advocacy to central government from a regional or local perspective as appropriate, to influence policy and investment decisions that support waste minimisation outcomes.
Achievement sharing	8	Local Project	BAU	Share achievements in waste reduction and resource recovery from HCC and partner organisations.
Bylaw Implementation (MUDs)	9	Regionally Coordinated	BAU	Ensure new and redeveloped MUDs meet bylaw requirements for waste and recycling infrastructure, supporting consistent service provision for residents.
Enviroschools	7	Local Project	Contract	HCC supports waste and environmental education across Lower Hutt through the Enviroschools programme and World of Waste tours for early childhood centres, kura and schools. The programme supports tamaki and rangatahi to build knowledge and capability around waste minimisation, sustainability and kaitiakitanga through practical learning, school-led action, and visits that connect learning to local waste and resource recovery systems.
Earthlink voucher scheme	12, 20	Local Project	Contract	The Earthlink voucher scheme at the Silverstream transfer station incentivises customers to separate their loads and divert recyclable and reusable materials from landfill. Customers who sort eligible items receive a discount voucher, supporting increased resource recovery.
SeatSmart	12	Local Project	Contract	The SeatSmart contract, delivered through Earthlink, supports the collection and recycling of used car seats.
Sustainable Coastlines	17, 18	Local Project	Contract	This contract with Sustainable Coastlines supports regular beach clean-ups across key coastal locations in Lower Hutt, removing litter and marine debris from the environment. It also provides monthly litter monitoring and reporting at selected sites to identify hotspots and trends and inform targeted litter prevention responses.



Infrastructure and Regulatory Committee

10 April 2026

Report no: IARC2026/2/105

Silverstream Landfill and Solid Waste Management and Minimisation Update

Purpose of Report

1. The purpose of the report is to update the Committee on the development, operation and quarterly performance of Silverstream Landfill, along with the implementation of Council's Waste Management and Minimisation Plan 2023-29 (WMMP).
2. Under the Terms of Reference, the Infrastructure and Regulatory Committee oversees Silverstream Landfill and solid waste infrastructure, while the Connected Communities, Climate and Resilience Committee cover waste reduction and the WMMP. This report relates to landfill operations and wider waste minimisation activities but does not seek policy or funding decisions. Hence, it is appropriate for this Committee to receive it while avoiding duplication with the Connected Communities, Climate and Resilience Committee.

Recommendation

That the Committee receives and notes the report.

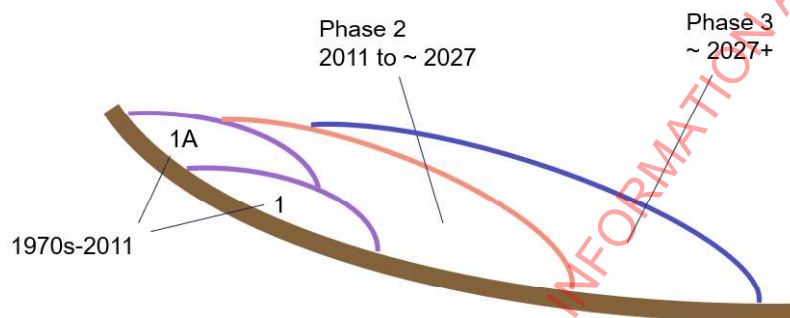
Background

3. Officers provide regular reports on Council's work to manage the collection and disposal of solid waste, and its efforts to reduce waste, under the umbrella of Council's WMMP.

Silverstream Landfill

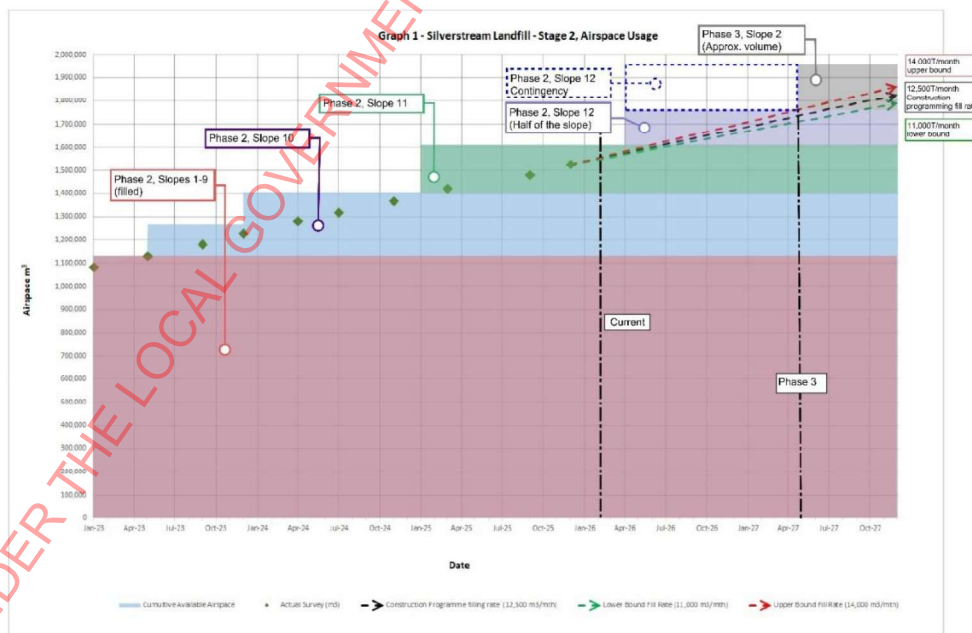
4. Construction work for the new Phase 3 of the landfill is progressing, with total planned capital expenditure for 2025/26 – including all CAPEX construction activities – of \$15.3 million. Delivery is currently tracking behind schedule, with at least \$1 million forecast to be carried over into FY26/27. This is primarily due to a combination of factors:
 - a. a \$3 million carry-over from FY24/25, which made an already ambitious work programme highly demanding, and
 - b. weather-related delays affect to landfill construction.

5. Importantly, all critical path work is on track. The deferred works are all non-critical and will need to be delivered in FY26/27, where there is greater capacity within a reduced work programme. As a result, no impact or delay is expected for the overall programme and the planned commencement of Phase 3 operations.
6. Filling of Phase 3 is scheduled to begin in 2027 from the new toe bund at the base of the gully and move up to meet Phase 2. To recap, the landfill's construction phases are shown below.



7. Figure 1 below shows the air space usage for Silverstream landfill in relation to the planned completion of new slopes and the new Phase 3.

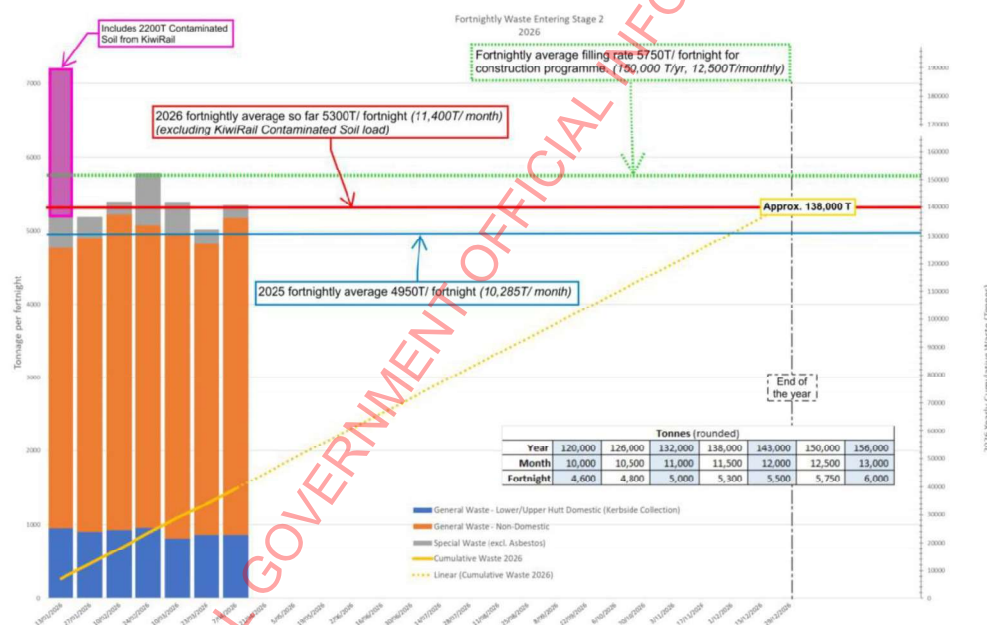
Figure 1: Air space utilisation at Silverstream Landfill



Waste volumes

8. The amount of waste deposited in the first quarter of 2026 is higher than in 2025 (see Figure 2 below). However, overall waste volumes remain below the original budget assumption of 150,000 tonnes per annum. This is likely due to continued lower-than-expected economic activity, particularly in the development and construction sector.
9. For FY25/26, this results in a forecast reduction in landfill revenue of approximately \$1.4 million, bringing expected revenue to around \$29.5 million, as reflected in quarterly financial reporting.
10. Looking ahead, waste volume assumptions have been updated as part of the Annual Plan process currently underway, with volumes adjusted to 134,400 tonnes per annum for FY26/27 to reduce the risk of a similar revenue shortfall.

Figure 2: Fortnightly waste volumes



Health and safety

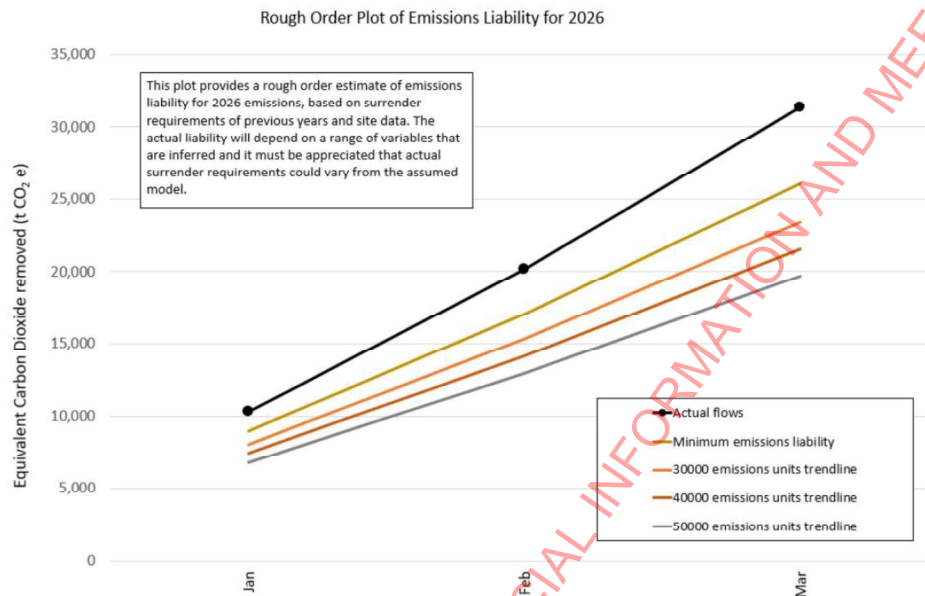
11. For the period from January to March 2026, no significant health and safety incidents occurred that resulted in injury or lost time.

Greenhouse gas emissions from waste disposal

12. LMS owns and operates the power plant and supplementary flare. Council monitors the effectiveness of LMS's performance in relation to Council's emissions liability under the NZ Emissions Trading Scheme (ETS). High effectiveness of gas extraction and destruction ensures that Council can minimise emissions and its liability under the ETS.

13. The emissions performance for the period January to March 2026 is on track to achieve the minimum liability under the Emissions Trade Scheme (ETS), in line with Council's objectives to minimise residual emissions.

Figure 3: ETS liability monitoring



Environmental performance

14. A summary of environmental performance for January to March 2026 is shown in Appendix 1.
15. The summary references management trigger levels being exceeded, which require investigation or mitigation measures to be undertaken as part of an adaptive management approach. Overall, the landfill remained compliant with its consent conditions.
16. Sediment control continues to present a significant challenge due to the extent of ongoing construction activities and associated ground disturbance.
17. To improve sediment management, the sediment pond was drained, and accumulated sediments were removed during March, with works continuing through to mid-April. Approximately 6,000 m³ of sediment have been removed. This increased capacity, along with additional improvements such as an enhanced forebay, will significantly improve the performance of the sediment pond.

Figure 4: Sediment removal from sediment pond, and sludge pit for removed sediment



18. The landfill received several odour complaints on 25 March 2026. This was associated with works to extend the existing sludge pit for sediments removed from the landfill's sediment pond. Once the works were completed, odour levels returned to normal.
19. Officers have previously investigated and have recently revisited options for automated odour monitoring at Silverstream. The outcome remains unchanged. From a technical perspective, landfill and sludge-related odours consist of complex mixtures of compounds rather than a single identifiable substance, and there are currently no reliable instruments capable of detecting these mixtures in a way that meaningfully reflects real-time odour impacts.
20. While some instruments can measure specific compounds (eg hydrogen sulphide, H₂S), many commonly used electrochemical sensors are significantly influenced by meteorological conditions such as humidity and temperature. For these reasons, when assessing odour at the landfill, officers utilise trained personnel to map odour patterns in the field. The human nose remains the most reliable tool for this purpose, with "calibration" involving a structured one-day testing process to ensure an individual's sensitivity to odour is within an appropriate range.
21. Officers have followed up with Upper Hutt City Council (UHCC) regarding how odour complaints originating in Upper Hutt should best be managed. UHCC has confirmed that processes are in place to redirect relevant complaints to Council.

Silverstream forest development and reverse sensitivity risk for landfill operation

22. The Guildford Timber Company Ltd owns the land north of Silverstream landfill and has been listed as a project under the Fast Track Amendment Act to develop 1,500 – 2,040 residential dwellings in the immediate vicinity of Silverstream Landfill ([link](#)).

23. A recently completed Reverse Sensitivity Analysis identifies risks to landfill operations, including increased costs and constraints, and highlights a risk to Council's ability to secure a new consent past 2039. Refer to Appendix 2 attached to the report. Note: Portions of the document in Appendix A of the Reverse Sensitivity Assessment have been redacted by the originating source. The document is sourced from publicly available information on the Fast-track website and represents the only information held by Hutt City Council.

Asbestos destruction demonstration

24. The EDL Asbestos destruction demonstration plant is scheduled to arrive at Silverstream landfill by the beginning of May 2026.
25. On Thursday, 21 May 2026, a group of 40-50 subject matter experts attending the WasteMINZ 2026 conference are scheduled to visit the asbestos destruction demonstration plant, highlighting strong interest in this innovative technology being trialled at Silverstream Landfill.

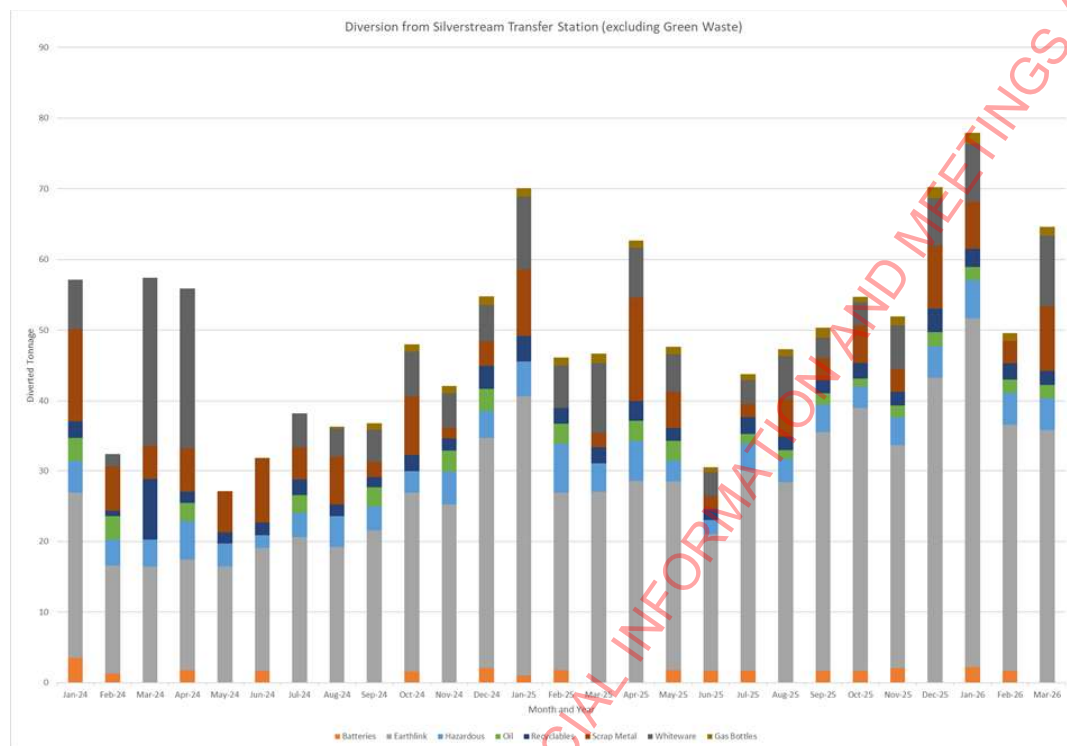
Development of a soil and aggregate recovery facility

26. This project remains on track, with the next key milestone being the funding decision by MfE, expected in May 2026.

Silverstream Zero Waste Hub improvements

27. Officers are currently investigating two additional waste streams for diversion - treated timber and plasterboard. Initial findings are promising, with further confirmation pending.
28. Silverstream's transfer station continues to achieve high diversion rates. A temporary decrease in February 2026 is likely attributable to increased landfill traffic during the two-week green waste waiver period, with some customers deferring other drop-offs until March.
29. The figure below excludes green waste diversion, which typically averages around 200 t per month. Following a severe weather event on 15-16 February 2026 that resulted in significant tree damage, Council implemented a 13-day green waste disposal fee waiver at Silverstream Landfill. This led to a substantial increase in green waste volumes, with over 3,697 transactions recorded, totalling 626 t during the waiver period alone.

Figure 5: Diversion (excluding green waste) from transfer station



New Heavy EV Charging Hub

30. A further two EV charger satellites are scheduled to be installed in May 2026, to enable charging of an additional two kerbside trucks. Officers are working with WM to consider the next tranche of on-site machinery and/or vehicles due for electrification.

Waste minimisation

31. Appendix 3 shows the updated portfolio dashboard to implement the WMMP, including both projects and business as usual work. Where relevant, updates are also provided for those regional projects led by Council officers.
32. Several projects or activities are highlighted in further detail below, where significant milestones have recently been met or are upcoming.

Enviroschools

33. In late 2025, Council signed a contract with Greater Wellington Regional Council (GWRC) to fund the EnviroSchools Programme (EnviroSchools) in Lower Hutt from 01 January 2026 to 31 June 2027. Seven other councils from the Wellington region signed similar agreements with GWRC. These agreements ensure the continued delivery of EnviroSchools throughout the region and ensure national consistency. The agreements are an interim measure while a regional, long-term delivery strategy is developed.

34. In addition to Enviroschools, Council also funds the World of Waste tour programme (WoW tours), which is unique to Lower Hutt. These tours specifically explore waste and resource recovery matters and include site visits to the Silverstream Landfill, Earthlink, the Dowse Art Museum and classroom-based follow-up discussions.
35. Earlier in the year, GWRC provided Council with the 2025 WoW tours report. A summary of the outreach achieved by the WoW tours throughout the 2025 calendar year is detailed in table 1 below.

Table 1: 2025 WoW Tour outreach

Number of tours	Students	Adults	Schools
25	628	133	13

36. Council achieved its target of establishing an Enviroschools connection with all primary schools in Lower Hutt in the 2024/25 financial year. Building on this achievement, Council has worked with GWRC and Enviroschools facilitators to extend this commitment, aiming to ensure that all Lower Hutt tamariki can attend a WoW tour at least once during their primary school years.
37. Council seeks to achieve this goal by increasing the number of WoW tours to 35 per year from 1 July 2026 onwards and by working with GWRC on an alternate WoW tour for older tamariki/rangatahi. This alternate WoW tour focuses on the importance of resource recovery and the circular economy, and includes Macaulay's metals, where tamariki will view "scrap" vehicles being disassembled by robotic machinery.
38. The impact of WoW tours is demonstrated through outcomes at Wainuiomata High School. Through engagement led by an Enviroschools facilitator with the school's food technology programme, students participated in a WoW tour, which acted as a catalyst for sustained environmental action.
39. Following the visit, students established a school-based environmental group and led a range of initiatives, including improvements to the school's recycling systems and the delivery of a fundraising stall at the school's September night market. Funds raised were reinvested into environmental projects, including the establishment of a vegetable garden and a composting system to manage food scraps generated through food technology classes.

Figure 6: Posters from Wainuiomata High School



Battery recycling

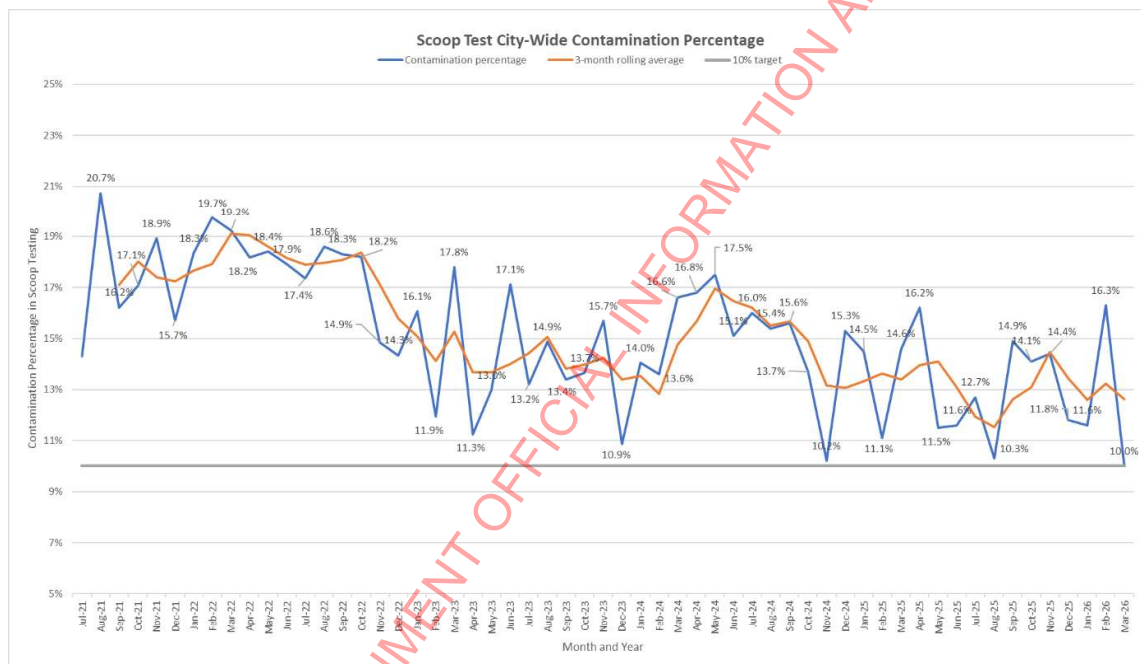
40. As reported previously, three battery collection units were successfully trialled at War Memorial Library, Naenae Neighbourhood Hub, and Eastbourne Neighbourhood Hub. The trial was well received, with officers reporting strong community engagement and positive feedback.
41. Following this success, four additional battery collection units have now been installed at Wainuiomata Neighbourhood Hub, Walter Nash Centre, Council's admin building, and Kōraunui Stokes Valley Neighbourhood Hub, bringing the total number of Council supplied units to seven. Work is underway to increase awareness of the battery drop off points and the fire risks associated with improper battery disposal.

Kerbside collection service

Contamination reduction

42. Despite Council's contamination reduction programme, monthly contamination is still variable and remains above the target of 10% (see figure below). Work continues to engage with and educate the community to reduce contamination. Officers are also working to update "hotspot analysis" based on sticker data and scoop test routes.

Figure 7: Monthly scoop test results July 2021 - March 2026



2026 WasteMINZ conference

43. WasteMINZ is the largest representative body of New Zealand's waste, resource recovery and contaminated land sectors. The [2026 WasteMINZ conference](#) will take place in May in Wellington. The Waste and Resource Recovery team will be presenting across three topics:
- Collaboration and constraints: Partnering to increase diversion at Silverstream landfill (in conjunction with Earthlink); and*
 - Biosolids in land rehabilitation: Navigating opportunities and regulatory responsibility (in conjunction with Tonkin and Taylor); and*
 - C & D waste – trialling a pathway when you don't have infrastructure.*
44. There will also be a site visit offered to attendees for the EDL pilot asbestos destruction demonstration at Silverstream Landfill.

Climate Change Impact and Considerations

45. The matters addressed in this report have been considered in accordance with the process set out in Council's [Climate Change Considerations Guide](#).
46. Minimising waste, diverting recyclables from landfill, and recovering reusable materials (such as the potential addition of C&D diversion opportunities, diverting biosolids, etc) contribute to a more circular economy. These activities reduce the need to extract further resources from the environment and the associated energy use.
47. To help achieve a reduction in operational emissions at the landfill, Council's operational and capital works contracts include emission reporting and reduction requirements for both Waste Management NZ and Leach & Co Ltd. In addition, a Heavy EV Charging Hub is in place to enable the electrification of on-site machinery and/or vehicles. Both contractors now operate some electric vehicles on site, including a 20t electric loader operated by WM New Zealand.
48. Regarding emissions from the landfill itself (methane), a powerplant and supplementary flare operated by LMS are in place to destroy methane and emissions as much as possible.

Consultation

49. There is no consultation required.

Legal Considerations

50. The Government confirmed in mid-December 2025 that new legislation is planned to regulate the management of waste and litter (replacing the current Waste Minimisation Act 2008 and Litter Act 1979).
51. Consultation was undertaken in April and May 2025, and HCC's submission is available in [the agenda for the Climate Change and Sustainability Committee on 2 July 2025 \(page 31\)](#). Once the draft legislation is released, officers will provide further analysis and advice.

Financial Considerations

52. There are no financial considerations currently.

Appendices

No.	Title	Page
1	Appendix 1: Dashboard for Jan to Mar 2026	97
2	Appendix 2: Reverse Sensitivity Analysis for Silverstream Landfill	98
3	Appendix 3: LAP Dashboard - May 2026	141

Authors: Jessica Hayman, Senior Advisor Waste - Planning and Strategy and Matthias Vest, Waste & Resource Recovery Manager

Reviewed By: Jörn Scherzer, Head of Climate, Waste and Resource Recovery

Approved By: Jarred Griffiths, Director Strategy and Engagement

Silverstream Environmental Quarterly Report for the Hutt Valley Services Committee (January to March 2026)

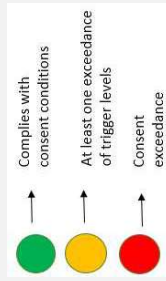


Monitoring effort during the quarter

Number of samples taken, or surveys and assessments completed

- Gas surveys - 5
 - Groundwater samples - 15
 - Surface water visual assessments - 12
 - Surface water samples - 12
 - Leachate measurements - 2 (Flow monitored 24/7)
- Refer to individual sections for detailed information on any exceedances.

Legend



Leachate

Leachate quality results:

There were no exceedances of leachate trade waste conditions.

Leachate flow volume (m3) to Seaview Wastewater treatment plant:

January	February	March
11418	7456	No data

The leachate flow meter was down and needs replacing, therefore, the values in the table above are estimates.

Daily leachate flow and rainfall

Total rainfall = 203.7 mm



Note: no leachate data available.

Water

Groundwater monitoring locations



Surface water monitoring locations



Groundwater analysis

Three exceedances were recorded for ground water quality parameters in the quarter. None were likely to be related to the presence of leachate.

Surface water analysis

No exceedances were recorded for any surface water quality parameters in January.

In February there was an exceedance of pH at SW2A. The likely cause of this does not appear to be related to leachate at the landfill. There were no pH exceedances recorded in the March monitoring round.

In March there were exceedances of ammonia at SW2A and chloride and at SW3A. These exceedances are likely related to the storm event occurring on 15 and 16 February causing two chambers on the tradewaste line to surge, leading to leachate entering the Sediment Retention Pond. The water in the pond was diverted to tradewaste.

Visual surface water assessments are also carried out monthly and no exceedances were noted in the quarter.

Tip stream (downstream of the landfill, SW4) visual assessment

SW4 Observation	January	February	March
Water Clarity	Clear	Clear	Slightly Cloudy
Foam	No	No	No
Odour	No	No	No
Algae	No	Minor	No
Flow	Low	Low	Low

Gas

Surface gas results

There were 44 methane concentration exceedances at 100mm above the landfill surface in the quarter. Remediation at each location is carried out upon instruction by T+T.

Gas probe results

No methane exceedances (>5% CH4 by volume) for either of the two probes located outside the landfill footprint.

Gas collected

Parameter	Unit	January - March
Gas flow rate	m3/hr	1333
Methane concentration	%	49

Odour

Months	January	February	March
Complaints	1	0	6
Total in Quarter		7	

Known locations of complaints





8 April 2026

Job No: 8662300.2526.2000.001

Hutt City Council
30 Laings Road
Lower Hutt Central
Lower Hutt 5010

Attention: Matthias Vest

Dear Matthias

Reverse Sensitivity Assessment - Silverstream Landfill Guilford Timber Company development: Silverstream Forest

1 Introduction

Hutt City Council (HCC) owns and operates Silverstream Landfill, located on Reynold Bach Drive, Lower Hutt. The landfill property is located at the Council boundary with the Upper Hutt City Council (UHCC). The property located immediately to the southeast and northeast of Silverstream Landfill is located within UHCC and was previously used for forestry purposes. This land is now proposed to be developed by the Guilford Timber Company, as 'Silverstream Forest' residential development.

The Silverstream Forest project is a listed project in the Fast Track Approvals Act 2024, which provides an alternate pathway for obtaining the relevant resource consents and approvals for the project.

This letter provides a reverse sensitivity assessment with respect to the Silverstream Forest project given its close proximity to Silverstream Landfill. Figure 1.1 below depicts the proposed development in relation to Silverstream Landfill, refer to Appendix A for the full Silverstream Forest concept plan.

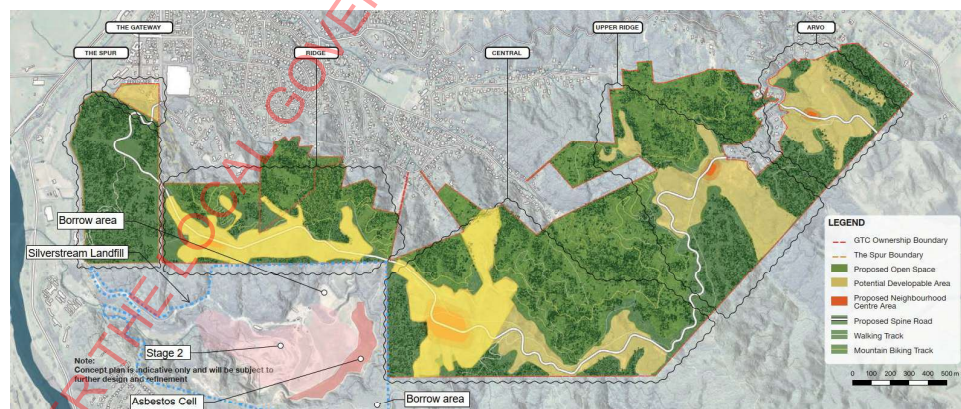


Figure 1-1: Silverstream Forest Development in relation to Silverstream Landfill (Source of base figure Studio Pacific Architecture Silverstream Forest Concept Masterplan, May 2024)

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2 Understanding and approach

Reverse sensitivity occurs when sensitive activities, such as residential properties or places of education or worship, locate where they may be adversely affected by industrial or noxious activities. Allowing sensitive activities to establish close to industry can have adverse effects on the health, safety or amenity values of people. Furthermore, it can limit the ability of the existing legally established industry or noxious activity to operate efficiently and with long-term certainty. It also has the potential to affect the economic and safe operations of such activities.¹

The definition of reverse sensitivity in the Upper Hutt District Plan 2025 (District Plan) is:

the vulnerability of an existing lawfully established activity to other activities in the vicinity which are sensitive to adverse environmental effects that may be generated by such existing activity, thereby creating the potential for the operation of such existing activity to be constrained.

In the context of this assessment, a 'reverse sensitivity effect' could occur if discharges from a legally established activity (Silverstream Landfill) result in:

- Complaints relating to Silverstream Landfill due to the increase in housing proximity and density, and
- Silverstream Landfill being required to restrict its operation or implement more extensive mitigation measures to reduce effects, because of the increased housing proximity and density.

Because of the points above, resource consents to authorise the continued operation of Silverstream Landfill after the current consents expire may be more difficult to obtain, and constraints on landfill operations may be required to obtain resource consents.

Reverse sensitivity effects from landfills are most commonly related to amenity effects from noise, dust or odour as the nature of these effects are readily observable and linked to the sensitivity of the receiving environment (i.e., the same level of dust or odour emissions may have differing levels of effects depending on the nature of the receiving environment).

Residential activities and zones are sensitive to amenity effects because residents can spend a significant portion of the day at home, and because of the high amenity expectations of residents while at home.

This assessment considers the potential for reverse sensitivity effects on Silverstream Landfill as a result of the proposed change in land use resulting from the Silverstream Forest development.

3 Site and surrounding context

3.1 Silverstream Landfill

The site has been an operational landfill since the 1970s. The landfill operation has been developed in the following stages:

- Stage 1 is the original landfill that operated at the head of the gully from the 1970s to 1998.
- Stage 1A sits above Stage 1 and was constructed between 1998 and 2009. Stage 1A has a clay liner and leachate collection system. Filling in Stage 1A has ceased, but this area is still used for disposal of special waste, such as asbestos.

¹ Ministry for the Environment. Good Practice Guide for Assessing Discharges to Air from Industry; 2016.

- Stage 2 is the current main area of filling down gully of Stage 1 and 1A. Filling in Stage 2 Phase 2 began in 2010. Stage 2 consists of a fully lined landfill, designed with a geo-synthetic plus clay lining system.
- Asbestos Disposal Cell (ADC) due to begin construction in 2027 and will be located above Stage 1A. (consented to 2058).

The existing current consents for Silverstream Landfill expire in 2039. Replacement consents will therefore be required to continue operating the landfill to its full capacity. Based on current waste disposal volumes and trends, the existing projections are for Stage 2 of Silverstream landfill to be at capacity sometime around 2055. However, the duration of active filling is uncertain as it is dependent on the volume of waste produced over time.

Figure 3.1 and Figure 3.2 below show the plan view and cross section of the Silverstream Landfill completed Stages to date and proposed future filling.

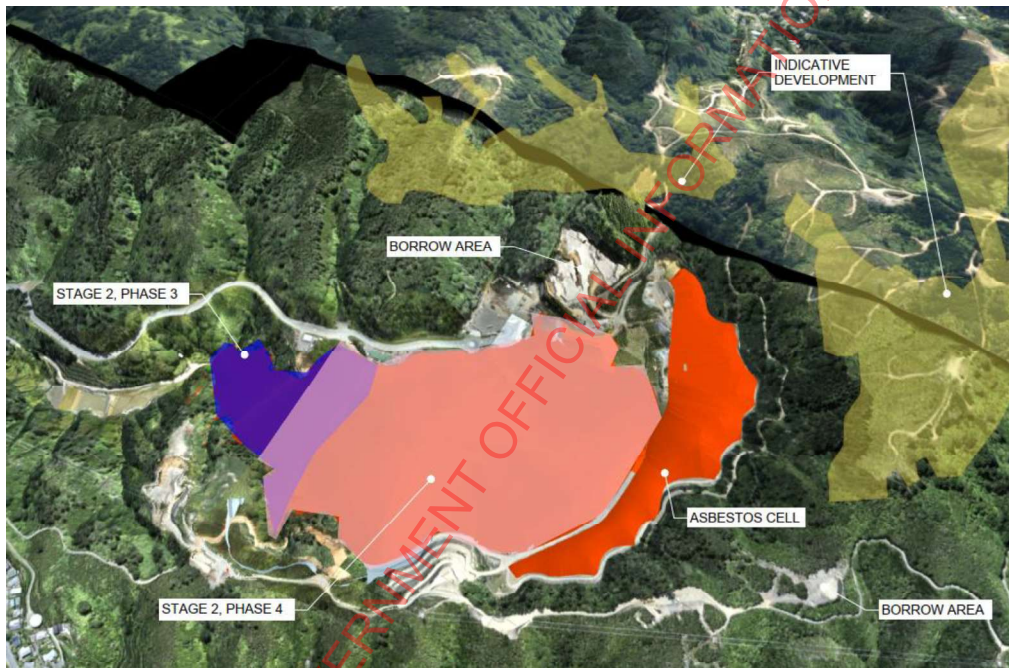


Figure 3-1: Plan view of Silverstream Landfill future development

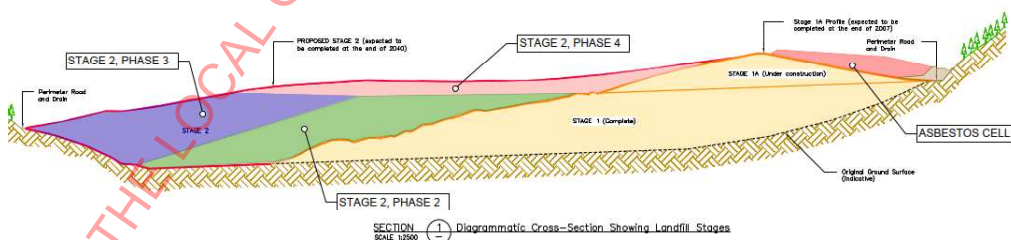


Figure 3-2: Stages of Silverstream Landfill filling and asbestos cell

Source T+T March 2026

The landfill is proposed to continue developing in the following order, particularly in relation to the adjacent northeast and southeast boundaries:

- 2025/2026 - Filling Stage 2 Phase 2, with construction for Phase 3 underway (middle and north of the landfill).
- 2026/2027 – Stage 2 Phase 2 – filling to commence, development of Asbestos Disposal Cell on Stage 1 (southern part of site furthest away from Phase 3) and filling to commence in Stage 2 Phase 3. (South, middle and North).
- 2027 to 2035 - Stage 2 Phase 3 development, Asbestos Disposal Cell development and filling (North and South).
- 2035 to 2037 – Continued filling in Stage 2 and asbestos disposal cell (North and South).
- 2037 to 2040 – Development Stage 2 Phase 4 and continued filling and asbestos disposal cell filling (middle of landfill).

3.2 Existing surrounding land use and zoning

Historically and to date the land to the north-east and south-east of Silverstream Landfill within UHCC jurisdiction has generally been used for forestry purposes. This land, now subject to the Silverstream Forest proposal, is currently zoned 'General Rural'. The District Plan describes the character of the General Rural zone as open and expansive with a relatively low density of buildings and vegetation being the dominant feature. The General Rural zone rules provide for various activities including farming activities, forestry, and minor structures. One residential unit per site is permitted, along with a family flat. Subdivision is permitted where the minimum lot size is 20 hectares.

3.3 Silverstream Forest development

The proposed Silverstream Forest development abuts the eastern and southern boundary of Silverstream Landfill. The boundary is currently approximately 250 m from the nearest landfilling activities at Silverstream Landfill although the borrow area activities are closer than this. The development includes rezoning, and is proposed to occur in stages.

A number of zones are proposed, including residential, neighbourhood centre, and open space. The concept plan for the proposed development is provided in Appendix A.

4 Potential effects of landfills

Landfills can result in various effects on the environment, including:

- Odour
- Noise
- Vermin
- Seagulls
- Flies and insects
- Litter

The potential for sub-surface migration of landfill gas is also a hazard that should be considered.

All of the above are managed by Hutt City Council within the requirements of the resource consents held for Silverstream Landfill, and Hutt City Council's desire to be a good neighbour.

The future development of Silverstream Forest was not considered as part of previous resource consent authorisations for the activities at Silverstream Landfill. However, the proposed

development will change the environmental context by replacing relatively low-sensitivity forestry activities with high-sensitivity residential properties.

This residential development associated with Silverstream Forest could be exposed to potential nuisance effects from landfill activities that conflict with the amenity expectations for residential sites. This may result in complaints from residents about the landfill activities, which in turn may result in limits on the operations and activities undertaken at Silverstream Landfill, and affect HCCs ability to obtain resource consents to continue operation Silverstream Landfill past the current resource consent expiry dates.

The potential nuisance impacts of Silverstream Landfill operations are discussed in more detail in the following sections.

4.1 Odour

4.1.1 Overview of landfill odour

Landfills generate odour from three primary sources: the active tipping face (working face), where fresh waste is exposed to air; the decomposition of waste within the landfill, generating odorous landfill gas; and landfill leachate, produced by the percolation of water through the landfill.

The level of odour that might be considered acceptable in an infrequently occupied forestry block (the existing situation) is higher than would be considered acceptable in a residential area (the potential future situation). Therefore, establishing new residential development closer than the current situation would increase odour sensitivity in the area around the landfill.

To assess the potential for reverse sensitivity effects from Silverstream Landfill, we have undertaken the following:

- Consideration of the separation distances to developable areas and comparison to relevant Australasian landfill buffer guidelines.
- Consideration of factors relevant to the dispersion of odours from the landfill within the local area.
- Consideration of field odour observations undertaken within the surrounding area of Silverstream Landfill.
- Consideration of recent historical odour complaints alleged to be in relation to Silverstream Landfill, including the quantity and locations of complaints received.

4.1.2 Landfill buffer guidelines

Landfill buffer guidelines can inform land use and development decisions for areas surrounding an existing landfill. A landfill buffer is an area of land used to separate or manage incompatible land uses and prevent land-use conflicts. A landfill buffer may include several separation distance guidelines to avoid or manage a variety of risks, including risks to amenity and human health.

New Zealand does not have specific landfill buffer guidelines. For this reason, we have reviewed available Australian state buffer distance guidelines. The most recent and applicable of these guidelines is the Environmental Protection Authority (EPA) Victoria's Landfill Buffer Guideline². The EPA Victoria guidance recommends buffer distances for putrescible (municipal) waste landfills based on the size of the tipping face.

We understand that Silverstream Landfill typically operates with a maximum tipping face size of around ~900 m². The EPA Victoria Landfill Buffer Guideline recommends that, for municipal landfills with a tipping face of up to 900 m², a minimum buffer of 500 m be maintained between the activity

² EPA Victoria. August 2024. *Landfill Buffer Guideline*. Publication 1950.

boundary³ of the landfill and sensitive land uses to avoid or manage human health and amenity impacts. EPA Victoria notes that this may be varied based on an appropriate odour/landfill gas risk assessment or audit that demonstrates that an alternative buffer is acceptable.

Based on this landfill buffer, there is a potential for reverse sensitivity effects within the areas referred to as “Ridge” and “Central” zones in the proposed Silverstream Forest development masterplan (refer to Figure 3.1). The recommended 500 m buffer area includes most developable areas and the proposed neighbourhood centre within the “Ridge” zone, as well as the westernmost areas of the potential developable area and the proposed neighbourhood area within the “Central” zone.

4.1.3 Local dispersion factors

Weather conditions, particularly wind speed and direction, can influence odour dispersion and the areas most likely to be impacted. During calm and low wind speeds (generally less than 3 m/s), the dispersion of odours can be reduced. Topography can also influence wind direction, particularly at low wind speeds, when winds tend to flow from higher to lower elevations. Conversely, under elevated wind speeds, wind is more likely to travel from lower to higher elevations.

HCC undertakes weather monitoring at the Silverstream Landfill. Analysis of on-site wind monitoring data for the years 2023 and 2024 indicates that the predominant wind direction is from the north-northwest, with a secondary prevalence of winds from the south. The “Central” zone of the proposed Silverstream Forest development is located within the predominant downwind direction from the landfill and may be subject to an elevated frequency of odours being received within this area. The Central zone of the Silverstream Forest development includes an approximate 100 m open space buffer, which provides some additional distance to the landfill. As filling of the landfill progresses towards the northwest (i.e., further from the Central zone), the intensity of odours received within developable areas of the Central zone is likely to decrease due to the increased separation distance.

4.1.4 Field odour observations

A series of field odour observations was carried out on 24 February 2026 to inform the extent and intensity of landfill-related odours on a single operational day. The odour observations were undertaken between 12:30 pm and 1:50 pm at six monitoring locations at incremental distances from the working face. The field odour observations were undertaken by Sam Oliver, Senior Air Quality Scientist, who has a ‘calibrated nose’⁴.

Winds observed during the odour surveys were generally a light to moderate breeze (2.7-5.5 m/s) from the south. It was noted that winds were gusty with some variation in wind direction during these gusts.

Monitoring was undertaken as a set of discrete 10-minute odour surveys at each location, with odour intensity recorded every 10 seconds (60 observations per location). Odour intensity was recorded using the intensity scale provided in Table 4.1.

The monitoring locations were approximately 20 m, 50 m, 80-90 m, 150-200 m, and 250-300 m from the active working face. The percentage of time that landfill-related odours were detected in each 10-minute field odour survey is presented in Figure 4-1. The results indicate a clear reduction in

³ The activity boundary is the outer boundary of the landfill activity that poses a landfill gas or amenity risk, such as a landfill cell (active, closed or future) or leachate pond.

⁴ ‘Calibrated nose’ refers to someone who has been tested according to AS/NZS 4323.3:2001 screening procedure for an olfactometry panellist and met the individual threshold and standard deviation standards.

observed odour intensity with increasing distance from the active face, with only very weak or weak odours detected beyond 250 m.

The extent of monitoring on 24 February 2026 was limited by accessibility, with dense forestry beyond 300 m north of the working face. These observations represent a single daytime snapshot and do not characterise the full range of meteorological or operational conditions under which landfill-related odours may be detected off-site (for example, stable early morning or evening conditions when dispersion can be reduced).

Table 4.1: Odour intensity scale for field odour observations

Scale of intensity	Description of intensity	Explanation
0	No odour	No odour (the odour is below the detection threshold).
1	Very weak	The odour is present but cannot be described using precise words or terms and cannot be attributed to a source. Previous observations have identified the character and so the 'very weak' odour character has been inferred based on previous observations or later observations from the same survey.
2	Weak	The odour is present and can only be recognised when concentrating.
3	Distinct	The odour character is easily recognised, can be described, and may be attributed to a source. The assessor can smell it without any effort or focus on it.
4	Strong	The odour character is immediately recognised and can be attributed to a source. The odour is strong, but not to an extent that would prompt a physical reaction.
5	Very strong	The odour at this intensity is likely to be undesirable. The observer may consider moving from the area.
6	Extremely strong	The odour is extremely strong and may induce a physical reaction such as gagging or vomiting. An instinctive reaction would be to mitigate against further exposure (e.g., move away from the area or cover nose and mouth).

Note: The **Explanation** column has been created by T+T staff to aid in recording intensity in a consistent manner.

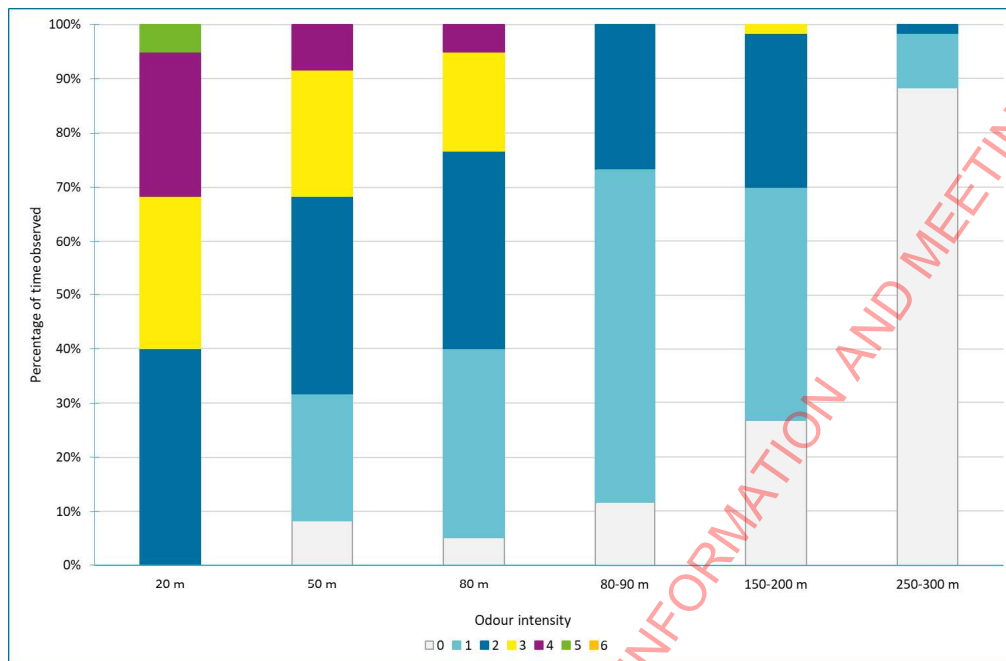


Figure 4-1: The percentage of time which landfill-related odours were detected, by odour intensity, for each 10-minute field odour survey.

4.1.5 Odour complaint history

HCC and the operators of Silverstream Landfill encourage existing residents to advise when particularly strong or persistent odours occur so that the management procedures can be adjusted over time. A log of odour complaints has been kept since 18 August 2006. During that time, 688 odour complaints have been received, allegedly in relation to Silverstream Landfill.

In the last 5 years (2021 to 2025, inclusive), 52 complaints have been received. Figure 4-2 shows the spatial distribution of the complaints received in this time period (where addresses were provided). This indicates that the majority of complaints received are from areas northwest of the landfill. Several complaints have been received from residents within the suburbs of Silverstream (7 complaints) and Pinedale (4 complaints), on the opposite side of the proposed Silverstream Forest development.

With the reduced separation distance between the existing landfill and the new Silverstream Forest development, and by simply increasing the number of people adjacent to the landfill, it is anticipated that odour complaints would increase within the intervening area, especially if new residents were unaware of the presence of the landfill and/or that some odour could migrate across the boundary in certain conditions.

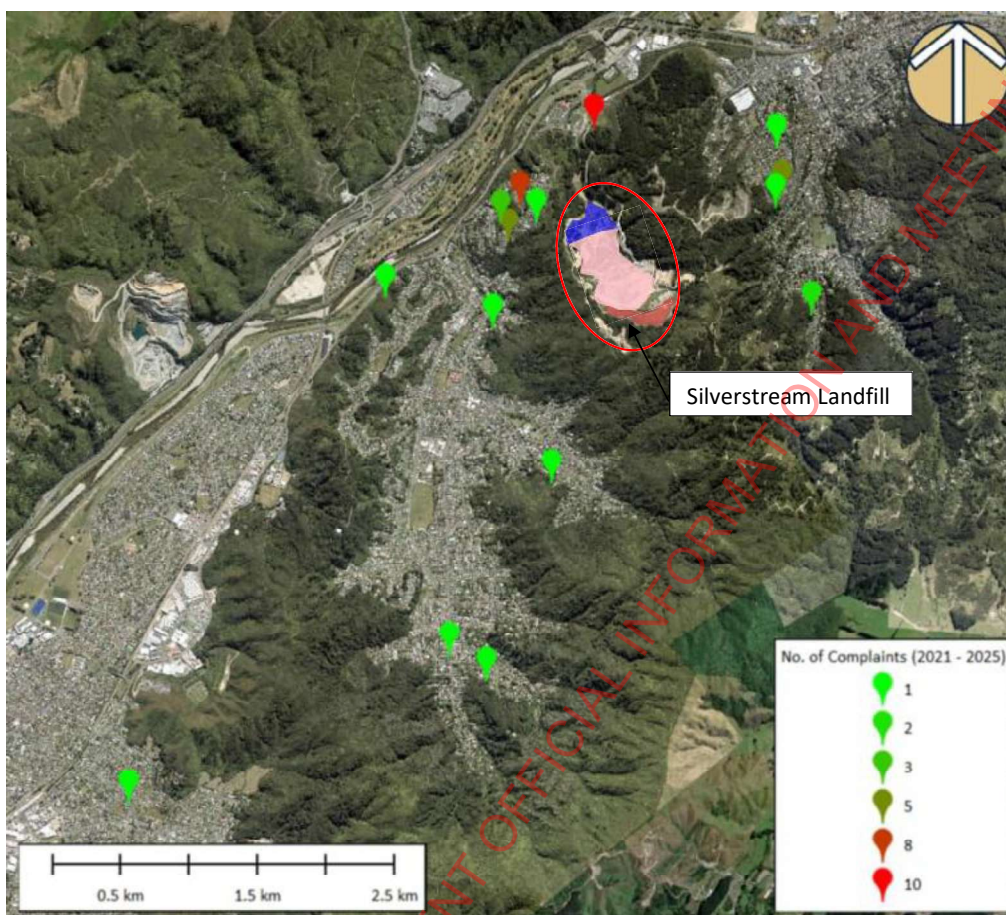


Figure 4-2: Number of complaints received between 2021 and 2025 (inclusive) by street/road name. Note: For some complaints, address details were not provided.

4.2 Noise

The hours of Silverstream Landfill operation are:

- 7:30 am to 5:00 pm during weekdays.
- 8:00 am to 5:00 pm on Saturdays and 9:00 am to 5:00 pm on Sundays and public holidays.
- Occasionally, work may be carried out before and after normal working hours.
- The landfill operates 364 days of the year.

There have been very few noise complaints received from residents, however, the proposed Silverstream Forest development is closer to Silverstream Landfill than the residential areas that existed at the time Silverstream Landfill Stage 2 was authorised via resource consent.

The available information relating to Silverstream Landfill and Silverstream Forest has been reviewed by an Acoustics Specialist, who has provided the following assessment.

The proposed residential development will increase the reverse sensitivity risk to Silverstream Landfill's existing and future operations. Currently, the nearest sensitive receivers are located approximately 450 m from the edge of Stage 2 landfill operations (Robson Street, Stokes Valley), providing a reasonable buffer that has historically minimised complaints. The proposed development will introduce sensitive receivers closer, at less than 250 m from the operational landfill areas and at less than 70 m from the Stage 2 borrow site, which extends to Silverstream Landfill's boundary. This reduced acoustic separation may affect Silverstream Landfill's ability to operate without neighbour conflict.

While a preliminary assessment indicates that construction-style noise from the borrow site operations can theoretically comply with construction noise limits at 70 m distance with appropriate management measures in place, future residents are likely to experience elevated noise levels above a typical residential amenity of 50 dB(A). This increase will be noticeable during the extended use of the borrow site, which is not currently in use, but has been consented. Furthermore, noise from routine landfill operations—including heavy plant, waste tipping, and impulsive bird-scaring gun shots—will be audible at the new residences. Additionally, the landfill regularly undertakes construction works to expand its operational capacity, which will be an ongoing source of construction noise throughout the life of the residential development. These expansion works will generate noise levels that are likely to exceed residential noise limits, albeit from a greater distance than the borrow site. Given the character of these noise sources and their occurrence during early morning hours when residents typically expect quieter conditions, there is an increased likelihood of complaints being lodged against Silverstream Landfill. While acoustic treatment of buildings would address early morning noise, outdoor amenity and the ability to connect with nature by having doors and windows open would present a conflict with how residents are likely to use their properties. Therefore, in this instance acoustic treatment of buildings is not the solution.

Complaints from nearby residents have the potential to affect Silverstream Landfill's operational flexibility, even where it is operating within approved consent limits. Complaints may lead to regulatory enquiries and discussions regarding operational modifications, such as adjusted hours, equipment restrictions, or changes to bird management practices.

4.3 Vermin, seagulls, flies and insects

Previously the community has expressed concern about vermin, seagulls, flies, insects and dust. However, to date, these have not been an ongoing significant issue during the operation of Stage 2 in the current environmental context.

It is anticipated that flies, insects or dust are unlikely to be an issue with the proposed Silverstream Forest development. However:

- Seagulls – at times seagull numbers can increase, which generally does not have a significant impact on the existing residential areas (no complaints received). It is not clear if this would also be the case for Silverstream Forest.
- Litter – the windy nature of Wellington in general, and the Silverstream Landfill site means that exposure in the upper phase areas near the proposed development may make litter an issue with the new development, especially with the close proximity to the working area of the landfill.

4.4 Landfill gas

Sentinel probes are installed between the landfill and existing residential properties. No significant gas has been detected in these; however, it would be prudent to install and monitor additional probes between the landfill and the new development to act as an early warning of gas migration. Bearing in mind the close proximity to the wastes, the new development may need to incorporate gas migration precautions into the building design.

5 Reverse sensitivity effects on Silverstream Landfill

The Silverstream Forest residential development will be sensitive to nuisance effects, as outlined in the previous sections. Therefore, over the longer term, the development may result in reverse sensitivity effects on Silverstream Landfill.

These reverse sensitivity effects on Silverstream Landfill could include:

- The need to manage relationships with an increased number of residential neighbours.
- Increased operational costs to further improve management of nuisance effects (for example, this could include additional activities or technology to further manage odour).
- Constraining activities undertaken at the site, which could include restrictions on operating hours to further reduce odour or noise effects, or restricting the types of waste accepted at the landfill to further manage odour.
- The landfill closing earlier than its design life, as a result of complaints, and being unable to obtain resource consents to operate past its current expiry of 2039. This will have significant cost implications for HCC, Upper Hutt and Lower Hutt City residents as an alternative landfill site and development will be required. This will most probably require trucking of waste out of the City boundaries which as advised by HCC will result in direct rates increase likely be in the realm of 4%-10%⁵ per annum and an associated increase in greenhouse gas emissions. There will also be a shortfall in the landfill's aftercare fund which has been calculated on the landfill having a full life. While HCC have advised the full costs are difficult to quantify due to multiple compounding factors, the outcome is clear: substantial long term financial pressure on Council, increased costs to ratepayers, and significant regional waste management impacts.

⁵ As advised by HCC in March 2026.

6 Other considerations

Three landfills currently operate within the wider Wellington area. One is Silverstream, another is the Southern Landfill in Wellington City, and the third is Spicer Landfill in Porirua City.

Spicer Landfill is likely to close within the next five years, as the ability to obtain resource consents to continue operating is uncertain due to increased complaints from nearby residential areas. If Spicer Landfill closes, both the Southern Landfill and Silverstream Landfill will be expected to take and dispose of the waste currently going to Spicer Landfill. This would therefore significantly increase the volume of waste being disposed of at Silverstream Landfill, and therefore potentially the reverse sensitivity effects.

More waste being deposited in Silverstream and Southern Landfills will result in these landfills reaching capacity sooner. Without more landfill space being made available and consented in the future, waste may need to be disposed of out of the Wellington region, which may impact council rates payable by property owners.

7 Reverse sensitivity management

7.1 Buffer area

The EPA Victoria's landfill buffer guideline recommends a minimum 500 metre buffer between a landfill and the nearest sensitive receptor. Based on the latest master plans for Silverstream Forest, the buffer is likely to extend over proposed developable areas within the 'Ridge' and 'Central' zones of the Silverstream Forest development.

To avoid or minimise adverse amenity effects on the development from the Silverstream Landfill, the Silverstream Forest development should consider redesigning its Masterplan to increase the separation distance between the landfill boundary and the nearest developable areas. This is expected to reduce both odour and noise impacts and provide improved residential amenity outcomes.

7.2 Registering interests on the resulting property titles at Silverstream Forest

To manage reverse sensitivity risk, developments can register "no complaint" / "reverse sensitivity" covenants on all residential titles created. This means that future owners cannot complain about the effects of the landfill activity operating. In reality, these covenants generally do not result in satisfactory outcomes for either the property owner or the landfill operation. Residents and property owners still complain, and Councils have no jurisdiction to enforce a private covenant.

8 Conclusion

Management procedures are in place to meet HCC responsibilities to manage nuisance impacts on existing residential activities that surround Silverstream Landfill, including in Stokes Valley and at Silverstream Retreat. A critical element of landfill management is maintaining appropriate separation between the operational landfill areas and residential land uses, to manage the effects of emissions.

The proposed Silverstream Forest development would introduce new residential receptors closer to the landfill than existing residential neighbours (currently ~450 m from Stage 2 operations; proposed <250 m from operational landfill areas and <70 m from the Stage 2 borrow site at the boundary). As a result, residents at the proposed development are likely to experience intermittent landfill odour and/or operational noise (the landfill operates 364 days per year) and may also experience minor issues with litter and/or seagulls. Even where the landfill is operating within consent requirements, the reduced separation and higher number of residents will likely increase the frequency of perceived effects and the volume of complaints.

This change in receiving environment sensitivity has the potential to create significant reverse sensitivity effects on the efficient operation of Silverstream Landfill, including increased monitoring/mitigation and relationship-management cost; pressure to modify or constrain normal operations (e.g., hours, equipment, bird management, or waste acceptance); and reduced operational flexibility over time.

Consenting risk is a key consequence. The closer proximity of new housing increases the risk that resource consents to continue operating Silverstream Landfill after the current consent expiry (2039) may be more difficult to obtain, and may require significant additional conditions/constraints to secure, with a realistic risk that consent may not be obtainable if effects on the now-more-sensitive environment are not considered acceptable. If consenting outcomes lead to major constraints or earlier than planned closure, this would have significant cost and strategic implications for HCC, including the need for alternative disposal capacity (likely requiring waste to be trucked out of the region with associated emissions), and a shortfall in the aftercare fund (calculated on full landfill life), and potential rates increases above historical averages (potentially 4–10% per annum).

9 Applicability

This report has been prepared for the exclusive use of our client Hutt City Council, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

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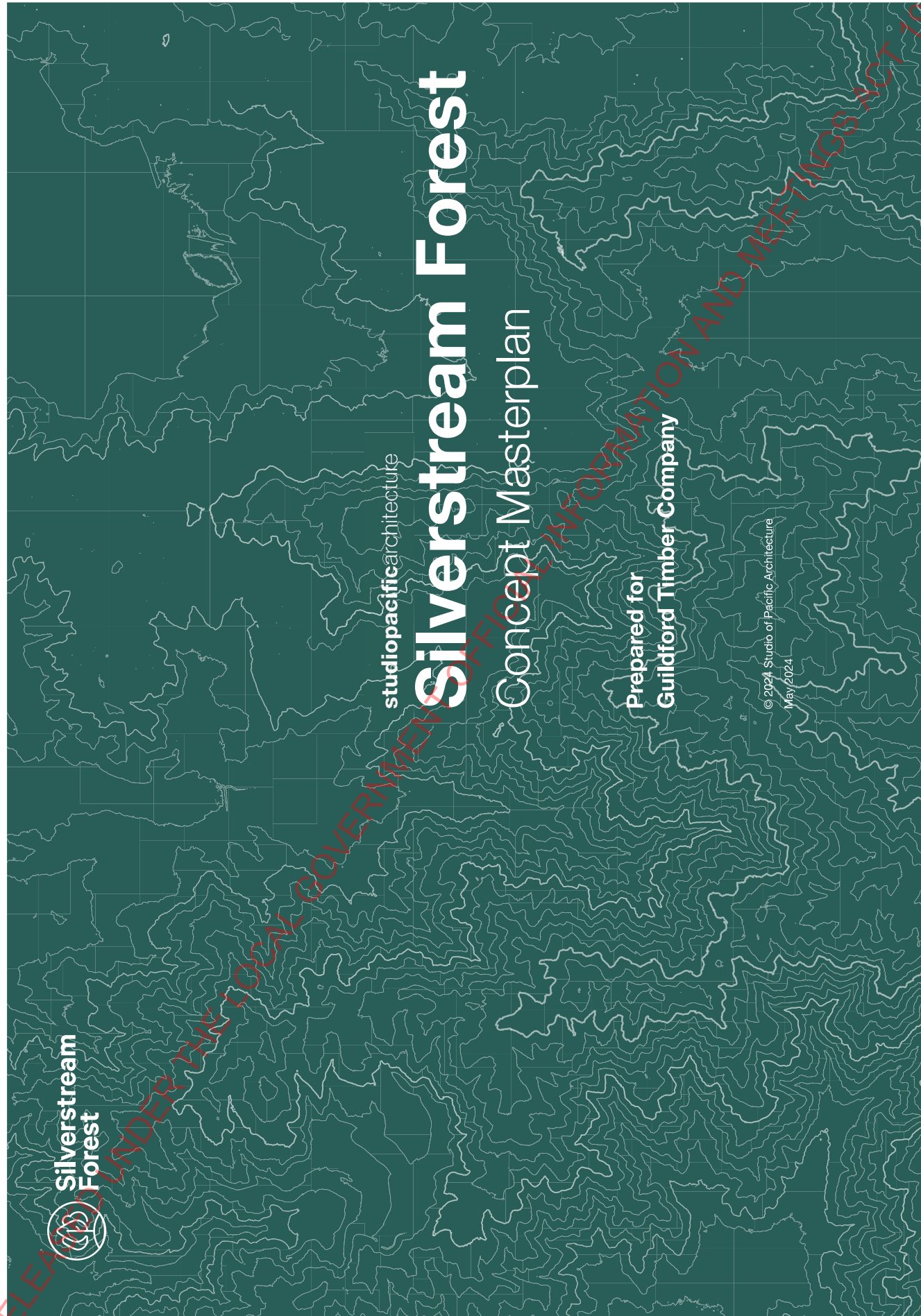
Project Director

8-Apr-26

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Silverstream_Final.pdf

Appendix A Silverstream Forest concept plan

RELEASED UNDER THE LOCAL GOVERNMENT OFFICIAL INFORMATION AND MEETINGS ACT 1987



studiopacificarchitecture

Silverstream Forest

Concept Masterplan

Prepared for
Guildford Timber Company

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May 2024

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Background

01

1.1

Introduction

1.1.1

Introduction

The Guildford Timber Company Ltd (GTC) is looking to create a significant residential development in Upper Hutt, known as Silverstream Forest. Silverstream Forest comprises both land owned by GTC in Silverstream at 44 Kln Street (known as the Gateway), and within the Southern Growth Area and land currently owned by Upper Hutt City Council (UHCC), known as the Silverstream Spur. The Spur provides an important access route and connection linking the new development to the Gateway and existing Silverstream Village and to existing amenities and infrastructure.

In 2014-2021 GTC and UHCC explored options of a Land Swap of suitable future reserve land owned by GTC for the Council owned Silverstream Spur. § 9(2)(b)(ii)

UHCC is currently advancing Plan Change 49 v-1 (PPC49v-1) to rezone the Spur Natural Open Space and provide for a Policy and rule framework that allows for an infrastructure and roading corridor through the Spur. The hearing process is underway.

The land to be developed by GTC is predominantly zoned 'Rural Hill'. The Spur is split-zoned between 'Rural Hill' and 'Residential Conservation' zones. 44 Kln Street was recently rezoned for High Density Residential and is within a walkable catchment to the Railway, and can be developed to 9 storeys under the District Plan.

1.1.2

Plan Change 50

UHCC is currently reviewing the rural zone chapters of its District Plan through 'Plan Change 50' (PC50). PC50 will be guided by both the Land Use Strategy, the 2023 Housing and Business Development Capacity Assessment (HBA), the Future Development Strategy 2024 and the National Policy Statement for Urban Development – to enable sufficient housing capacity to meet future demands.

GTC has filed a submission seeking the rezoning of the Silverstream Forest land via its submission on PC50 to residential and a special purpose precinct at Arvo Road, that plan is in its infancy with further submissions expected in late May 2024.

1.2

Concept Masterplan

1.2.1

Concept Masterplan

This concept masterplan document sets out the proposed approach for development within the Gateway, Silverstream Forest and the Spur sites. It is a vision-based precursor to a more detailed masterplan that GTC was developing to support a proposed plan change for the area as part of the UHCC PC50 plan change and/or any resource consent that would be acquired via the Fast Track Approval Bill (if successful).

1.2.2

Low Impact Development Principles

The Guildford Timber Company is owned by an intergenerational family of Hutt locals who care about the form of development delivered by the property. Low impact principles for Stormwater and Road Design will be the key to a successful built environment in this location.

1.2.3

A Mātou Tirohanga

Guildford Timber Company's vision for Silverstream Forest is to create a unique residential development where people live closer to nature. A resilient and sustainable development that is a benchmark for future living.

Development will fit sensitively along the forest ridge line, and the steeper slopes will be retained in native bush and pine.

There is opportunity for the undeveloped area to become a public reserve with accessible walkways and cycleways for recreation and enjoyment. Areas of harvested pines will be re-planted with native trees as part of our efforts to restore and improve the ecological, biodiversity, and catchment management values of the future reserve.

The site will be developed sympathetically to its environment in order to minimize biodiversity loss and climate change effects. At Silverstream Forest this will be done by creating a development that has low embodied and operational energy targets for the housing and infrastructure, on site carbon sequestration through exotic and native trees, and enhanced biodiversity through extensive regenerative planting of permanent native bush.

1.2.4

Recreation

Access to parks and open space is known to improve people's physical and psychological health. It also strengthens communities by providing opportunities for outdoor activities and enjoyment. We believe our proposed forest track infrastructure offers the beginning of a wonderful footprint for future recreational opportunities.

1.2.5

Living with Nature

We're proposing housing that fits sensitively along the forest ridge-tops, set within mature pine and regenerating native forest and at the Gateway offers the chance to live in a highly urban community, with unprecedented access to natural areas right on your doorstep. This is-a once in a-lifetime opportunity to create a residential development – an entire new suburb within an existing forested environment; something that's uncommon in the Wellington region.

1.2.6

Restoration and Conservation

Silverstream Forest is an important ecological corridor, connecting natural areas on both sides of the valley. One of the most exciting possibilities of the development is the opportunity to enhance the ecological and biodiversity values of the area, by creating the opportunity for an extensive public reserve.

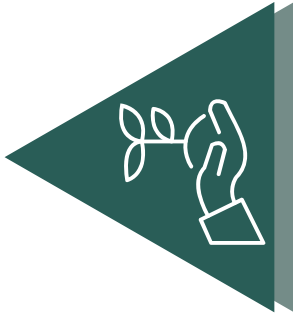
The aim is to revert harvested land not needed for the development into native forest, to benefit future generations.

The development of housing and roads would be done in a way that interweaves with the natural values of the future reserves, while providing opportunities for local residents to enjoy, and get involved with protecting nature.

1.3

Overarching Principles

The Guildford Timber Company aim to ensure that a long-term legacy is achieved through the development of a masterplan that is grounded within the existing natural environment, in a way that responds to the bush setting, the underlying topography and the ecological context, and which is guided by their overarching principles:



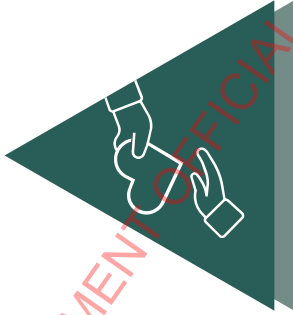
Sustainability

We conserve and respect the natural environment.
Development that is resilient to climate change and natural hazards and addresses Aotearoa's sustainability targets.



Innovation

We need to think differently and be future-focused.
Adopt cutting-edge research and technology for sustainable development.



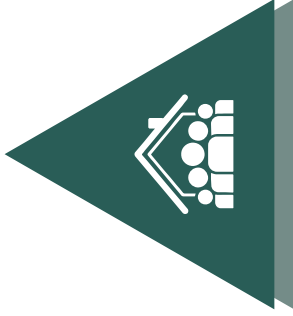
Connection

We feel a strong sense of place within the community.
Silverstream Forest will be an extension of the existing area.



Guardianship

We're committed to caring for the land that's been entrusted to us.
Promote kaitiaki/tāngā through leadership and helping people to connect with nature.



Creating New Homes

We are committed to providing affordable homes to serve the needs of the community.
Provide high-quality affordable housing catering to a range of occupants and in response to market requirements to help address the housing crisis.

1.4

History of Guildford Timber Company

The Guildford Timber Company is a family-owned company that was established in 1926. It has a 90+ year history and association with Upper Hutt, and in particular with Pinehaven and Silverstream.

Silverstream Forest was first planted in pine trees in the 1920's by Sir Francis Chichester and Mr Geoffrey Goodwin. They met in 1923 when Francis Chichester emigrated to New Zealand at the age of 18.

The pair went into partnership and built up a successful business in aviation and land development, creating the suburb of Pinehaven into a residential conservation zone in Upper Hutt. The men then moved their attention to the Blue Mountains area of Whitemans Valley, which neighbours what is now the Silverstream Forest.

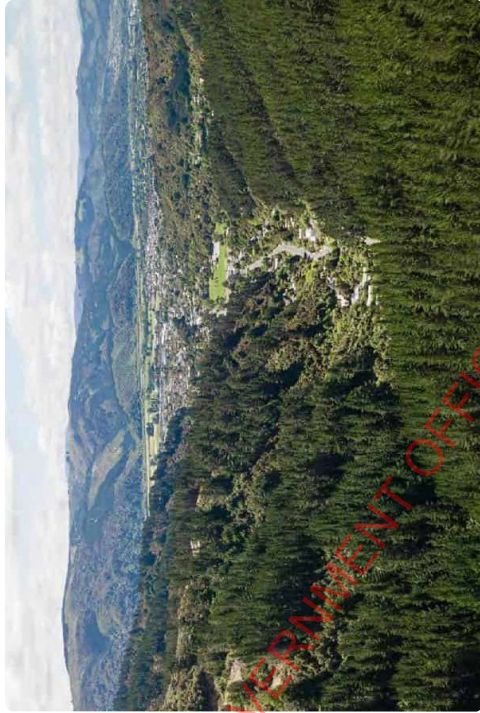
GTC owns approximately 330ha in the Silverstream/Pinehaven area. Its land comprises the steeper slopes surrounding existing residential areas, and the rolling ridges around the southern and eastern sides of the Pinehaven valley, extending over into Blue Mountains. Since 1928 the land has primarily been used as a commercial pine plantation, much of which is ready to be harvested, to make way for redevelopment for housing.

GTC has always maintained a strong environmental and social ethic in the management of its land. It has always sought to protect remnant and regenerating areas of indigenous vegetation, and continues to plant a range of native species like rata, beech, rewarewa, kamahi and manuka over the winter planting season to enrich the forest.

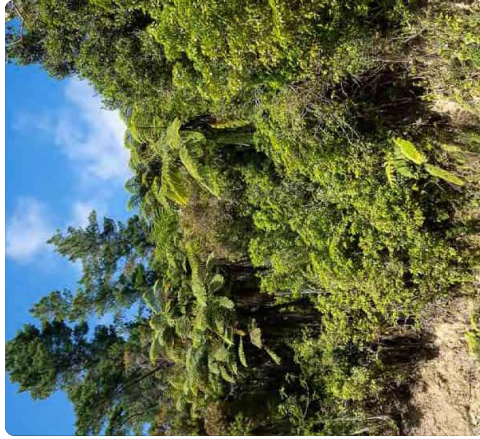
About 30,000 native trees have been planted by GTC since beginning their restoration programme. Over the last five years alone, they've planted almost 20,000 native trees to restore areas where pine trees have been harvested. In the next few years, harvested blocks will be reverted back into permanent native forest and GTC will embark on a pest management programme to ensure the new plantings thrive.

Continuing a Legacy

The families feel strongly about continuing on the legacy that Francis and Geoffrey left them, by continuing to support the development of the beautiful suburbs and communities of Silverstream and Pinehaven, which they've called home for almost 100 years.



View looking northwest, of Pinehaven and Silverstream - Silverstream forest in the foreground and to the left.



Native bush regenerating in Silverstream forest.



References to Geoffrey and Francis' passion and involvement in aviation.



Pinehaven streets named after the Goodwins and the Chichesters.



The transitional nature of production forestry highlights the Spur in 1985. Source: Retrolens

1.5

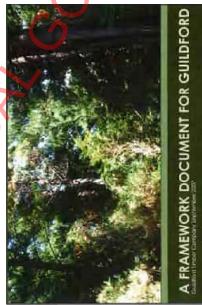
Planning history of the Southern Growth Area

The Southern Growth Area has been planned since 2007. Throughout that time Upper Hutt City Council and GTC have worked together to plan for the transition of this land from forest to housing. Details of this is set out in chronological here.

2007

Upper Hutt Urban Growth Strategy

The Guildford Growth Framework formed the basis of the Southern Growth Area for the Upper Hutt Urban Growth Strategy (2007). This was adopted by Upper Hutt City Council in 2007.



A FRAMEWORK DOCUMENT FOR GUILDFORD

2007

Masterplan -SKM

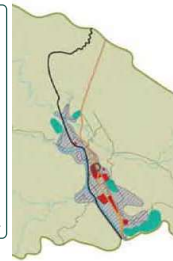
Site first identified as being potential future urban development and formally assessed by James Lunday from Common Ground, Boffa Miskell Limited and SKM. The development was feasible from an infrastructure planning perspective and the environmental effects, constraints assessments and infrastructure and serving work done to support that framework was comprehensive and extensive.

2016

Upper Hutt Land Use Strategy

Identified the SGA as the largest of the and four urban edge expansion areas

Identification of the edge expansion areas considered criteria including topography, environmental constraints, access, infrastructure, and landowner enthusiasm and capability. The SGA was identified as a location that "needs to be considered as a key strategic housing location for the next 30 years"



Upper Hutt Land Use Strategy (2016)

2021

Development of the Pinehaven Flood Management Plan and Plan Change 43

In parallel to the development of the growth strategies, the Southern Growth Area was also assessed and taken into account for the Pinehaven Flood Management Plan (PFMP). This was used as the basis of informing Plan Change 43 to the Upper Hutt District Plan and stormwater infrastructure improvements to Pinehaven. These stormwater improvements to address existing issues and future climate risk are currently being implemented.

2021

Provision for supporting infrastructure for the SGA in UHCC Long term Plan

In 2021 consistent with the pattern of Council lead planning for the SGA it was recognised as a future urban area in the UHCC Long Term Plan 2021- 2031 as a high growth area called the Southern Growth Zone, that was recognised and accounted for in the planning for public infrastructure upgrades for growth planning purposes. It that would require a replacement Silverstream Bridge in years 4-10 and a new pine haven reservoir in years 11-20 (page 137). Both of these investments were identified as requiring significant capital investment but have been planned for in the LTP to provide for Medium Term Growth.

2022 - 2024 (ongoing)

Plan change 49 - variation 1 to enable roading, network utilities and water tanks on the spur (currently being heard)

Variation 1 was notified on 5 October 2022, PC49 proposes to "... Enable site-specific provisions for infrastructure, including a transport corridor.

Provide access to the Silverstream Spur for a range of recreation, conservation and customary purposes, as well as potential future access to the Southern Growth Area (through the proposed site-specific provisions),"

2024 (ongoing)

Plan Change 50

GTC has filed a submission seeking rezoning of its land to residential and special purpose precinct. Through that process GTC will seek to have that land rezoned residential via that proposed plan. Further submissions are expected by the end of May 2024 and hearing in 2026.

2021 - 2022

Reconfirming the Masterplan

The IAF application sought a contribution from Government towards the cost of the road, infrastructure corridor, and water reservoir that would service at least the first stage of development at Silverstream Forest: approximately 400 houses. A Concept Masterplan, engineering strategy and cost estimations were completed for this application. This included detailed consideration of three waters, network utilities, stormwater and traffic infrastructure – for much of the site. This was a joint application with UHCC and UHCC supported those assessments presented.

Studio Pacific Architecture then prepare a concept masterplan to reconfirm the development, environmental and infrastructure assumptions for developing the Southern Growth Zone in 2022. Envelope Engineering also undertook concept level engineering work to confirm if the development is able to be implemented through private investment and that existing Council Infrastructure connections can be provided for water supply and wastewater. GTC were able to confirm that up to 1600 household units could be provided to help create those communities and contribute to the regions place-making. This plan further demonstrated the connections, constraints and infrastructure/ services for the site.

Klin Street Masterplan

In 2022, Studio Pacific Architecture also created a set of detailed development options for the Klin Street site to inform discussions with UHCC.



2022 IAF Masterplan

Conclusions on planning history for the SGA

This detailed history of the site, including Council lead planning processes and provision in the Long-Term Plan, joint planning undertaken with Council and GTC and GTC's own work including its own financial feasibility work demonstrates that development of the SGA are well connected and planning for the infrastructure for the SGA has been advanced by Council, over the last 17 years. As the remaining pine forest on the SGA matures and is harvested SGA is primed for re-development.

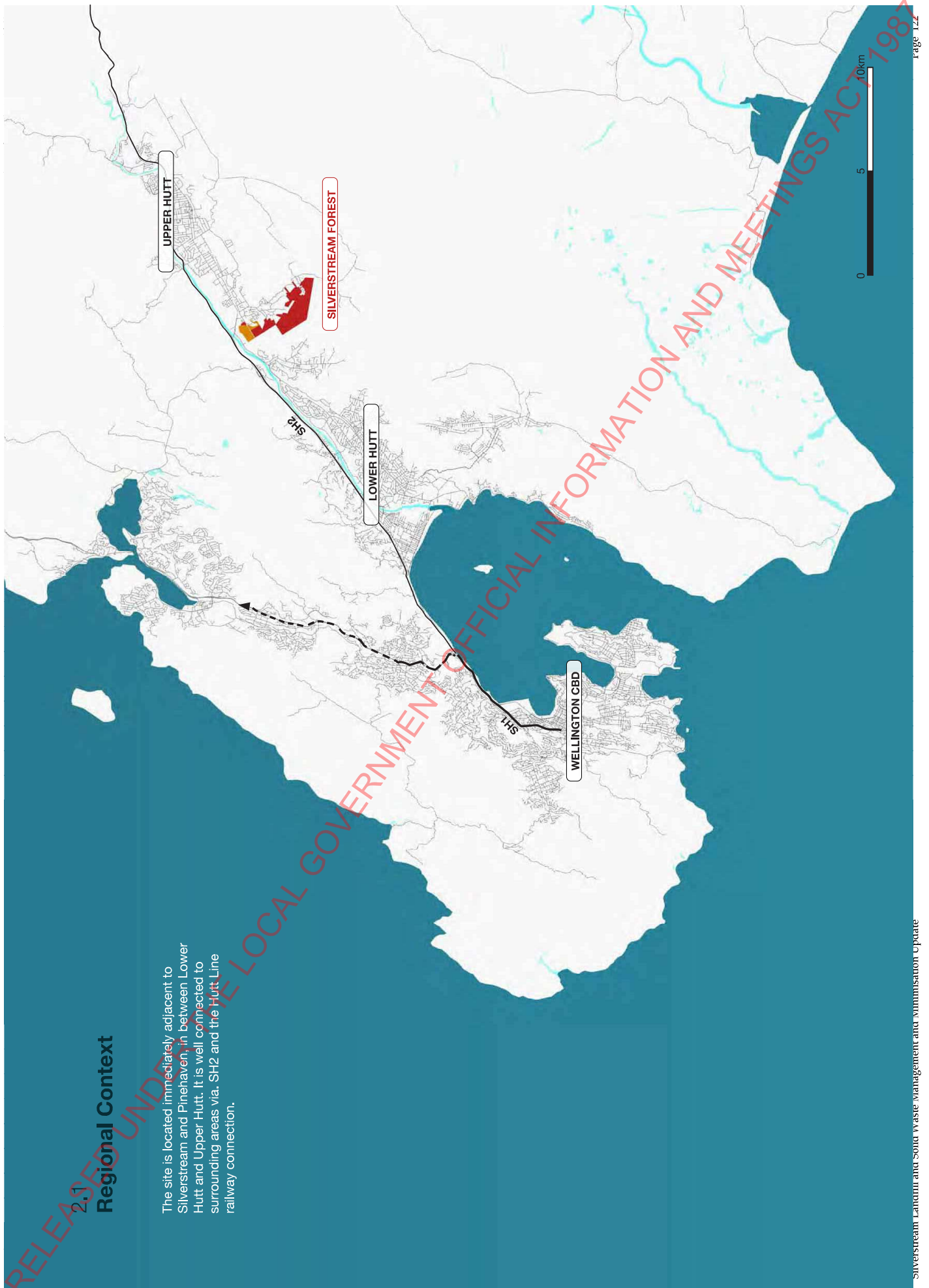


What is Informing Our Concept Masterplan?

02

2.1 Regional Context

The site is located immediately adjacent to Silverstream and Pinehaven, in between Lower Hutt and Upper Hutt. It is well connected to surrounding areas via SH2 and the Hutt Line railway connection.



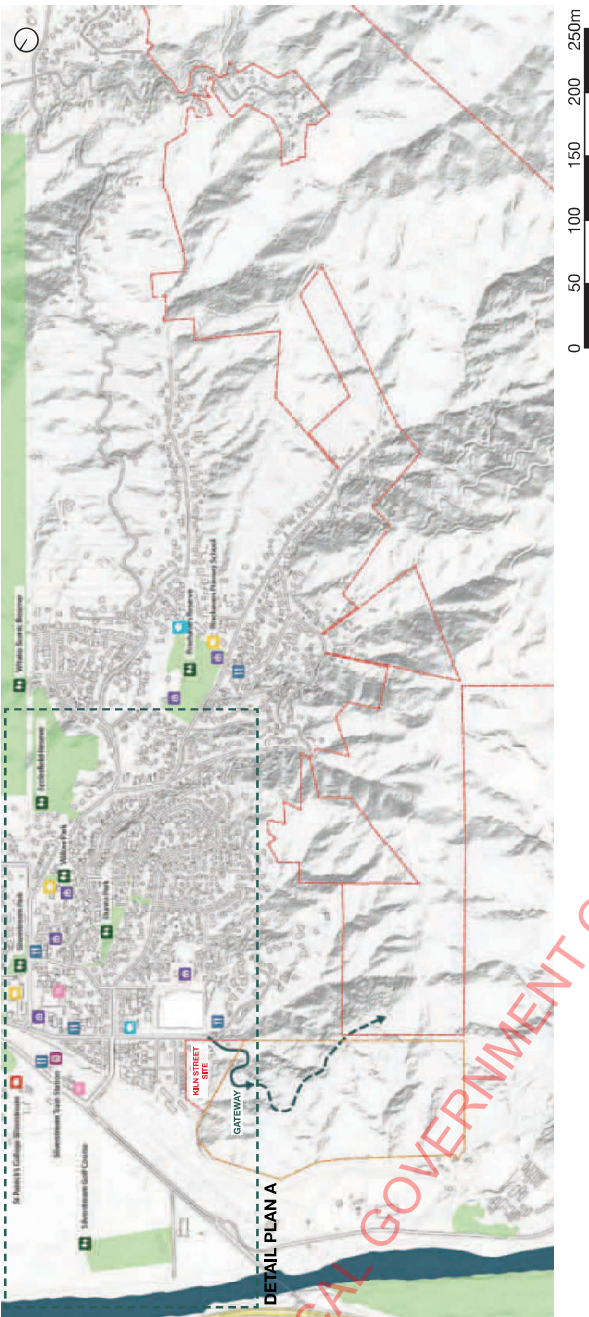
2.2

Site Context

The site is strategically located with excellent public transport links and is well-connected to nearby town centres. Porirua, Upper Hutt, and Petone are all within a 20-minute drive. Access to SH2 is straightforward via Ferguson Drive from Kiri Street, and Wellington Railway Station is less than a 30-minute train ride away, offering convenient access to the central amenities of Wellington.

Additionally, Silverstream Forest's proximity to public transport and key amenities enhances its appeal as a great place to live. It is only a 10-minute walk from the northern boundary of the site to the nearest bus stop on Field Street. Similarly, the Silverstream train station is just a 10-minute walk away. Being connected to and having access to the most important centres and amenities makes Silverstream Forest a great place to live.





2.3 Existing Amenities and Access

The site is ideally located in close proximity to existing amenities in Pinehaven and Silverstream. These include the Silverstream Railway Station, Silverstream shops & New World supermarket, Pinehaven (primary) School, local bus routes and access to State Highway 2 linking the area to the rest of the Hutt Valley and the greater Wellington region. There is good connectivity into existing UHCC services and three waters infrastructure via the Spur and Kiln Street.

Kiln Street is the closest road link to the site from Silverstream and Pinehaven. Other access points exist off some Pinehaven streets, but these are all walking and cycling links given the steep terrain.

Blue Mountain Road and Avro Road take you up to the eastern/back end of the site. However, these are narrow, winding roads with limited capacity and does allow for integration with existing infrastructure services/networks.

DETAIL PLAN A



LEGEND

- GTC Ownership Boundary
- - - The Spur Boundary
- 🌳 Parks and Reserves
- 🎓 Primary Education
- 🎓 Secondary Education
- 🎓 Early Childhood Education
- 🏠 Community Facilities/Churches
- 🛒 Services (Supermarkets, Dairies, Petrol Stations)
- 🍽️ Restaurants, Bakeries, Cafes
- 🚂 Silverstream Train Station

2.4

Hydrology

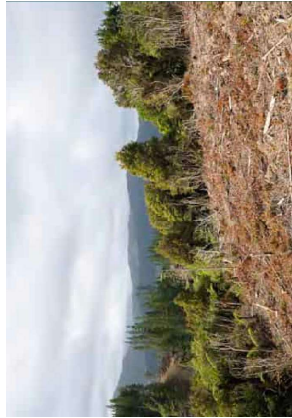
The development is within the Pinehaven Catchment as well as neighbouring catchments to Stokes Valley and Mangaroa. The topography provides for a relatively fast response to rainfall runoff through the streams running into the valleys towards Pinehaven and Silverstream and ultimately the Hutt River. The existing streams and extensive tree cover across the site to attenuate runoff. However following harvesting of Pine trees runoff is exacerbated. Substantial stormwater control and catchment management which will be integral to the design intent of this development will be required as part of the development to provide for stormwater neutrality.

Management of stormwater and run off is planned for and will be primarily achieved through:

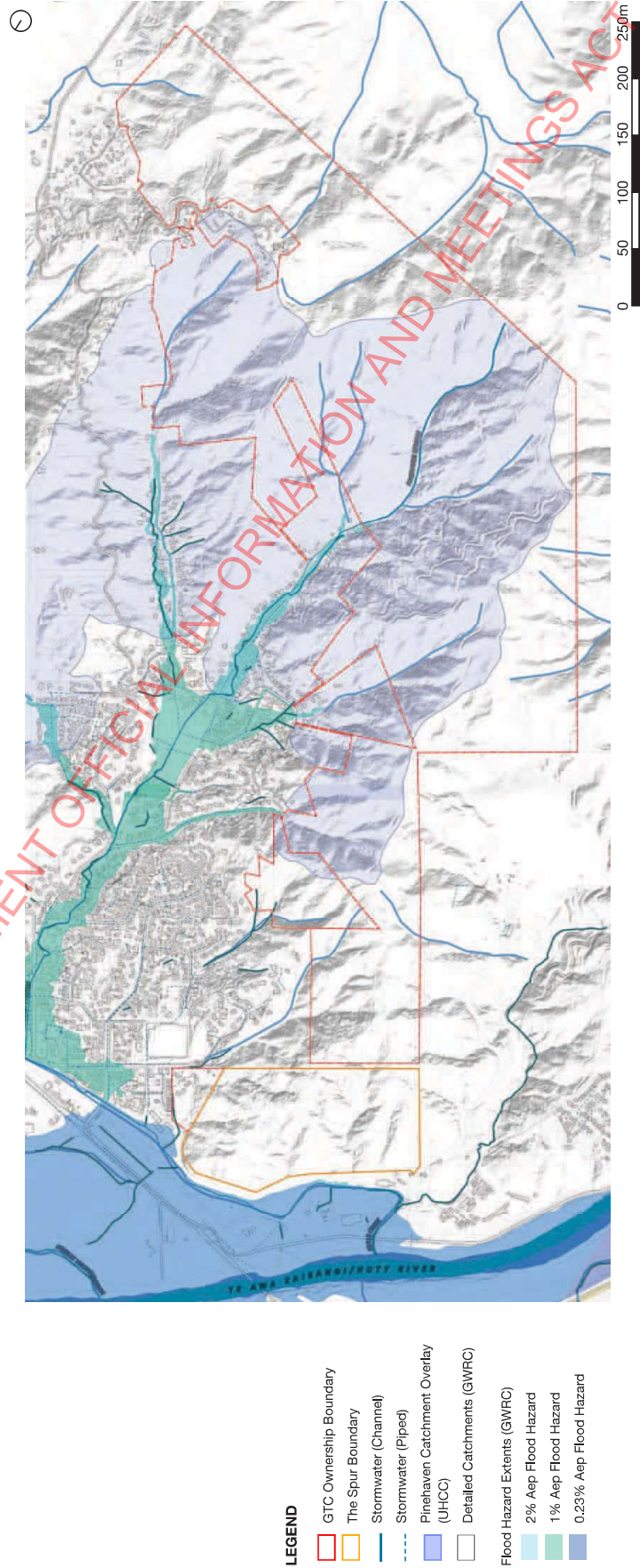
- Minimising impervious surfaces and using low impact stormwater design
- Maintain native vegetation cover and replanting reserve areas with native vegetation to minimise stormwater management and run-off requirements and downstream effects in the long term
- Providing attenuation ponds and providing rainwater tanks to harvest and manage peak flows.



Pine logs ready for the port



A harvested area ready to plant, with native bush protected



2.5

Landform + Topography

The site rises west to east along a ridge line from the Spur (~140m above sea level) to the top of Avro Road (~380m above sea level). Predominantly the landform has north-eastern and north-western aspects looking up the Hutt Valley to the Akatarawa Forest and the Remutaka ranges. Slopes on the southern side of the ridge line have sweeping views into Whiteman's Valley, Stokes Valley, Lower Hutt and to Te Whanganui-a-Tara, Wellington Harbour.

Steep slopes constrain development opportunities on the site but also provide sun and stunning views of the surrounding areas while retaining much of the green backdrop enjoyed by existing residents. The existing network of forestry tracks promote suitable access routes.



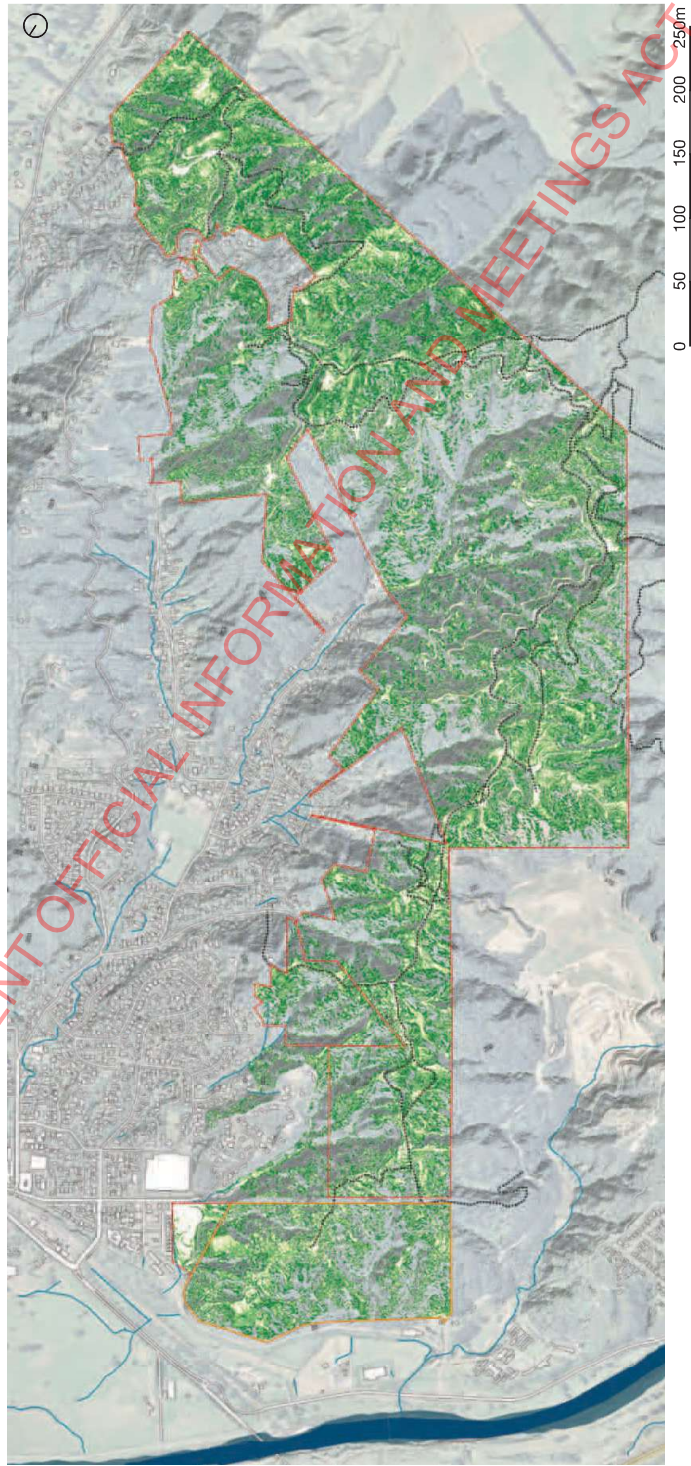
Views to Hutt Valley



Views to Wellington Harbour



Landform allowing a network of trails for biking and walking



2.6

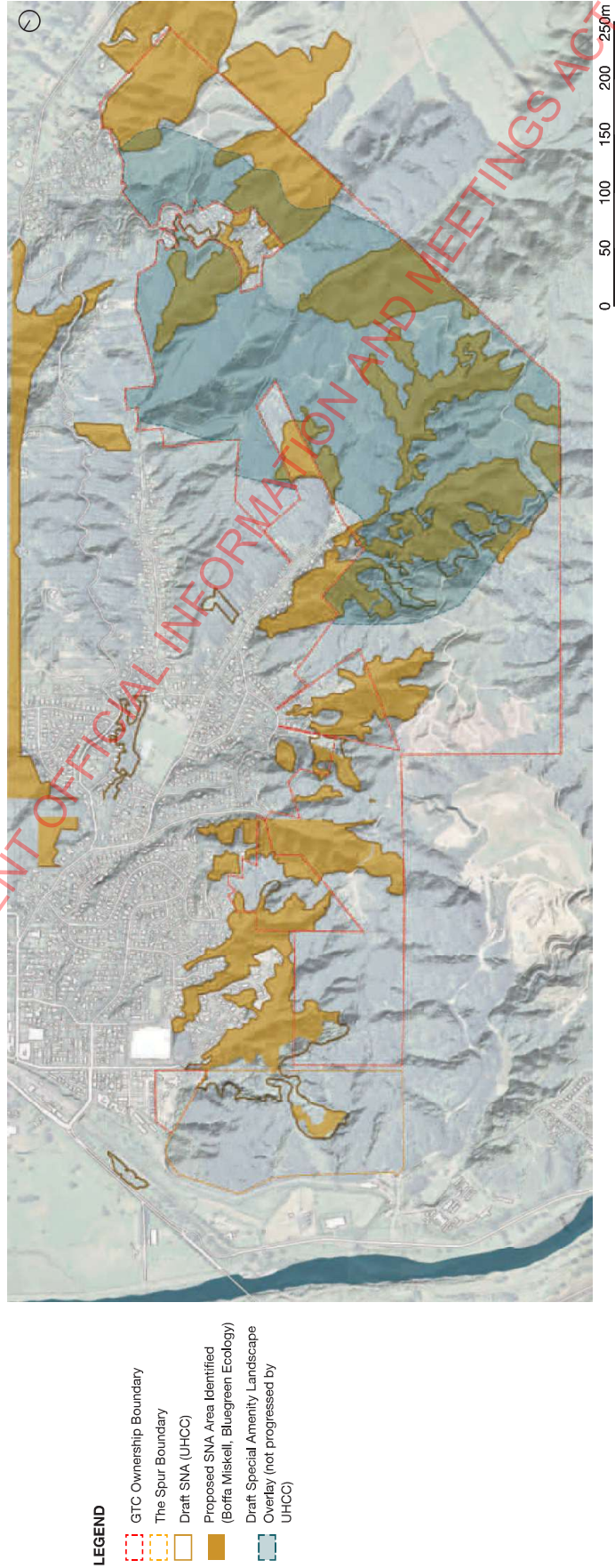
Significant Natural Area +
Special Amenity Landscape

GTC have built upon work completed by UHCC over the last decade that has identified Draft Significant Natural Areas and Special Amenity Landscape Overlays for Tiaki Taio draft plan change. This work has primarily been GIS based with some field visits across the region. UHCC chose not to progress with the Special Amenity Landscape Overlay, but the work undertaken has formed a useful base against which to understand potential constraints. GTC has worked with Boffa Miskell and Blue Green Ecology to undertake more detailed visual, landscape and ecology assessments.

These assessments have fed into this masterplan and informed decisions on how the site should be used. In particular the character of Pinehaven and Silverstream has been defined by the hills and forest. Retaining and improving this character through retiring commercial forest and allowing housing to be sensitively sited and controlled through design measures is a key design driver to enable quality development.



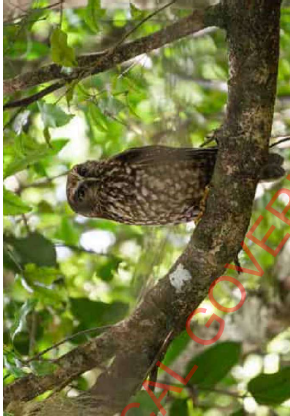
View northwards from site



2.1

Ecology

In terms of managing ecological terrestrial and freshwater values, updated reports building on the Boffa Miskell work has been completed to understand the values of remnant and regenerating forest. Gullies across the site also have freshwater values associated with streams that run through the site. The avoidance of these significant natural areas and provision for regeneration of this land through provision of reserves is a core part of the place-making for the site and management of ecological effects. These reserves also provide for management of landscape values and will provide stepping stones for ecological connection between Silverstream forest and other ecological areas across the district.



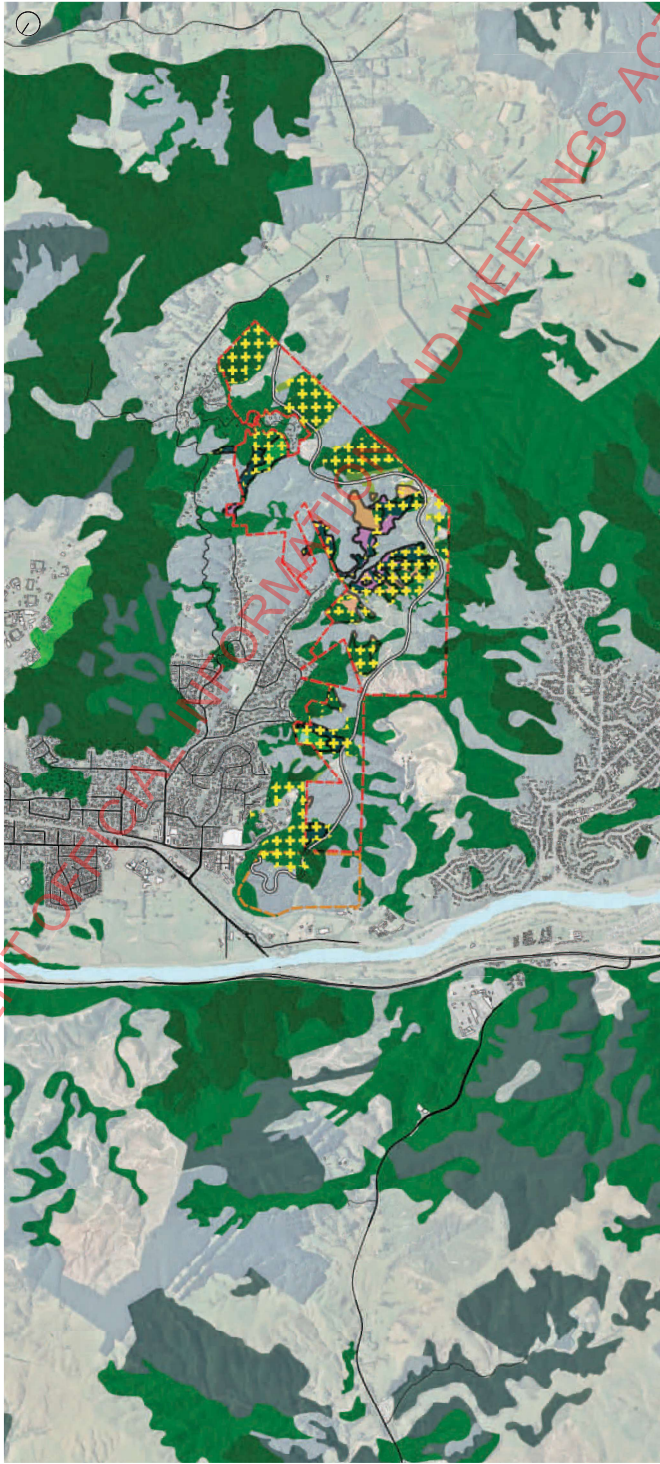
Runu spotted on site



Mixed native forest on site



Beehives on site



2.8

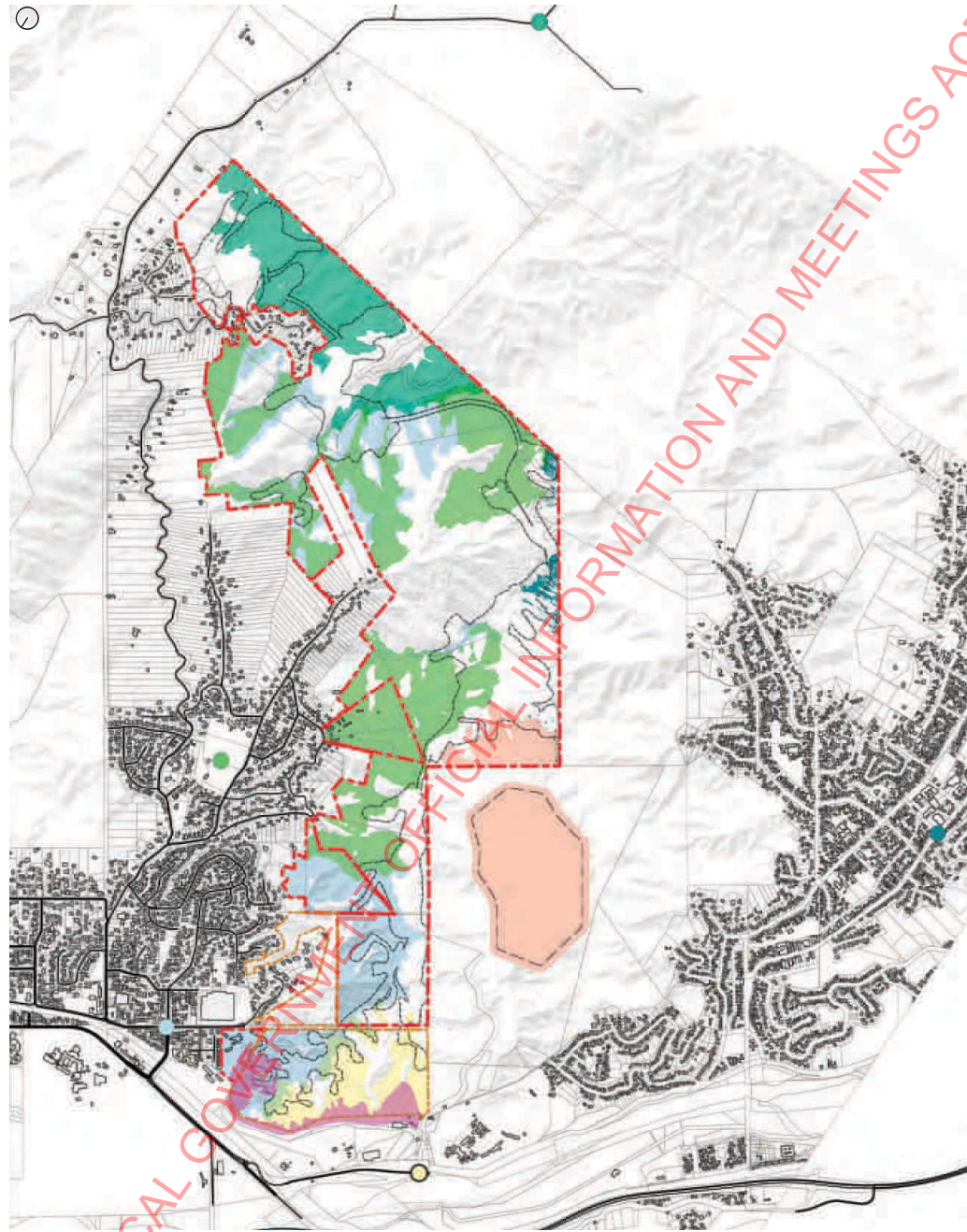
Site Sensitivities

With the elevated position of the site, views from external suburbs/areas have been identified and considered in terms of their prominence and sensitivity. By using Geographic Information Systems (GIS) data, the map opposite plots the areas of land (including 8m above ground level, to account for potential building heights) that will be visible from an identified viewpoint.

These viewpoints include:

1. Pinehaven Reserve
2. The intersection of Kih Street and Field Street
3. A location on the Eastern Hutt Road
4. The centre of Stokes Valley

There are also existing constraints within the site, in terms of constraints in relation to the Silverstream Landfill – visual, noise and odour – and more minor effects from the Silverstream Railway (train enthusiasts) in terms of a noise buffer that need to be considered when creating new residential areas on the site.



LEGEND

- GTC Ownership Boundary
- The Spur Boundary
- Whitemans Valley View In
- Pinehaven Reserve View In
- Kih Street Intersection View In
- Eastern Hutt Road View In
- Stokes Valley Centre View In
- Landfill impacts
- Rail Corridor adjacency impacts

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2.10

Technical Considerations

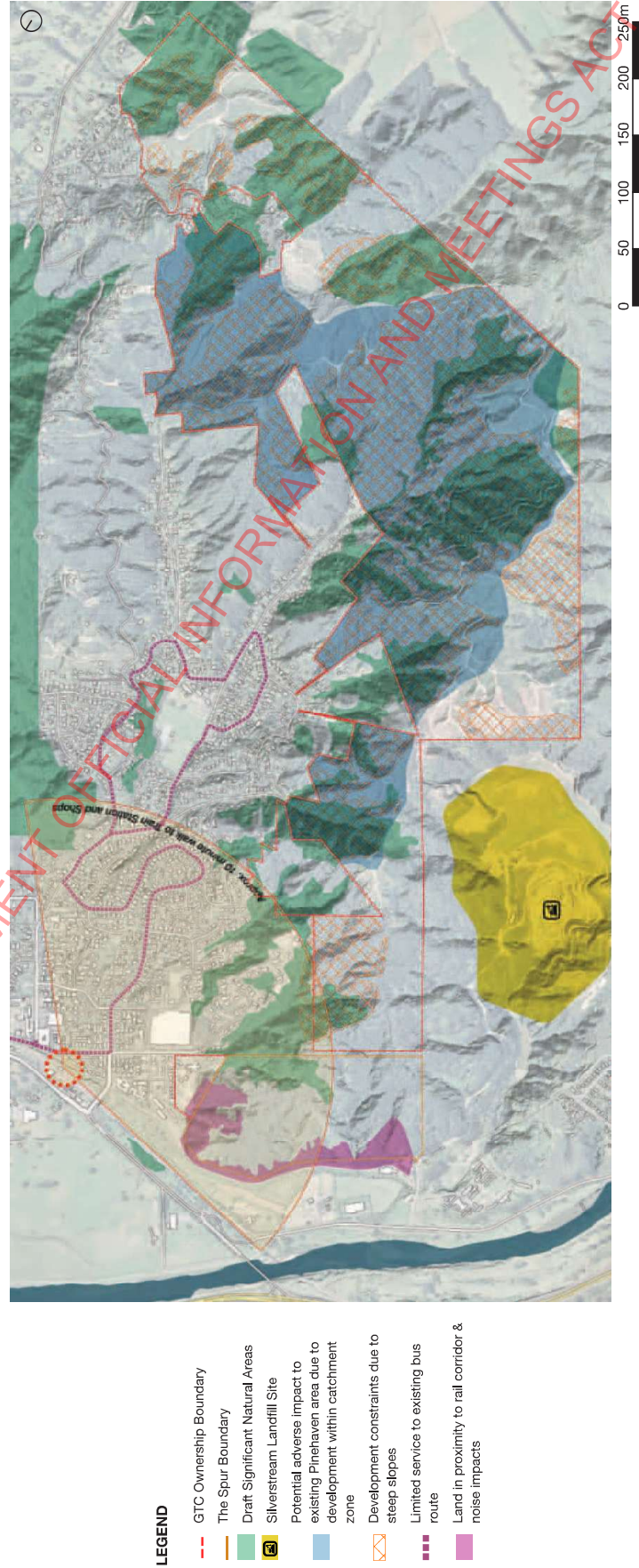
The proposal presents opportunities amidst the unique characteristics of the landform, steep topography, access challenges, and site hydrology. Embracing these features, we're poised to develop a holistic tree waters approach that ensures a sustainable water supply to our vibrant new community. This approach will encompass innovative strategies for water capture and reuse, while also prioritising the preservation of waterways.



Slope constraints across the site



Access to the site from the Silverstream Train Station



2.11

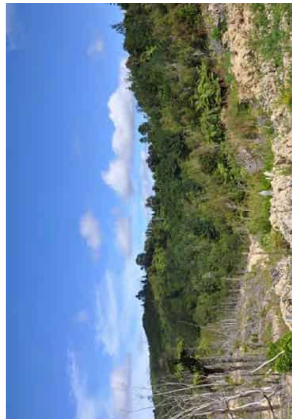
Opportunities

Silverstream Forest offers the opportunity to provide 1500-2040 homes to help address Upper Hutt City Council's and Greater Wellington's housing crisis. It provides a sensible, considered and long planned for new suburb with a range of housing typologies and price levels to help meet projected housing demand goals.

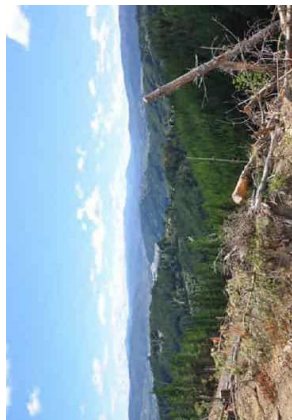
In addition, the following can be realised:

- On-site carbon sequestration to offset the carbon attributed to the development.
- Significant biodiversity and ecological benefits offered by the potential reserve areas.

- Significant developable land area and associated housing yield offering a range of typologies.
- An enviable reserve to link into the existing community and wider recreational routes.
- Social and cultural assets – connectivity by bringing people closer to nature.
- Connects into/integrates with existing services/infrastructure and routes.



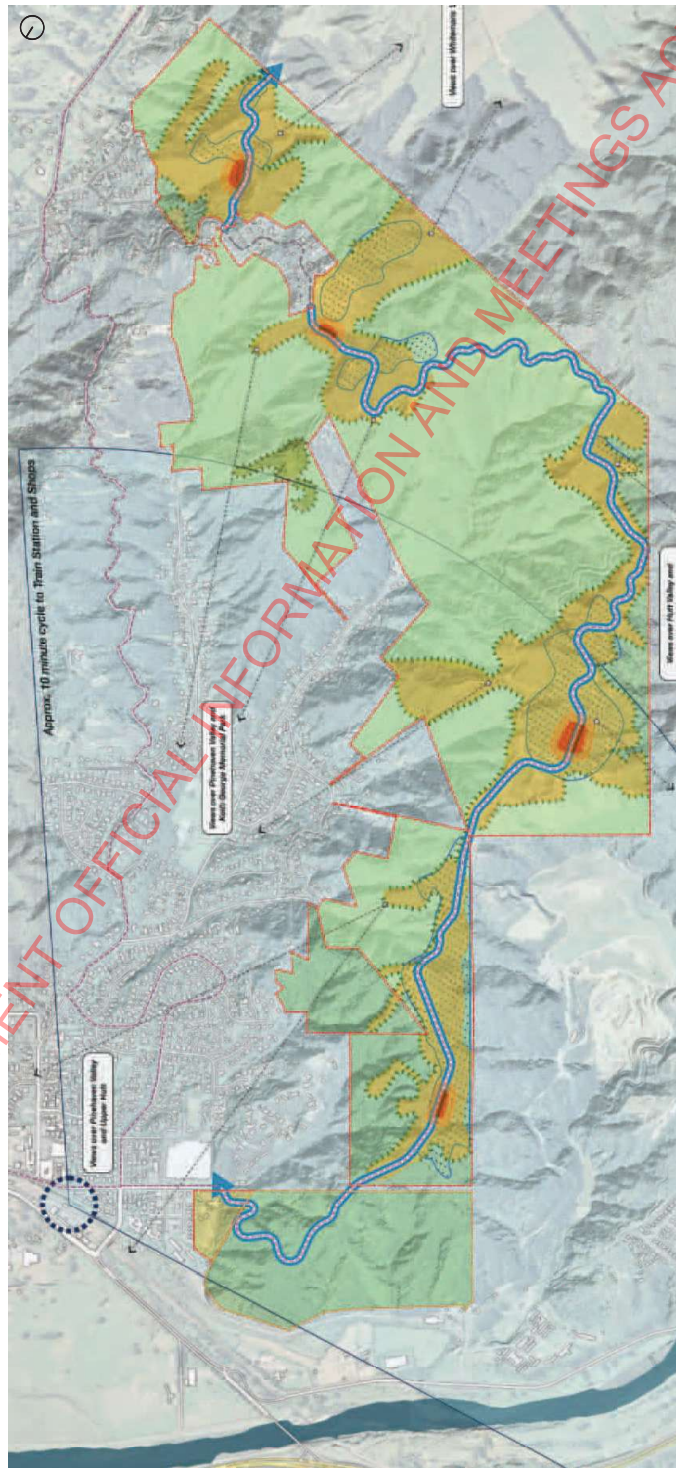
Opportunity to live and connect with nature for the new and existing communities



Incredible aspect and views lead to sought after living opportunities

LEGEND

- GTC Ownership Boundary
- The Spur Boundary
- Potential Developable Area
- Potential Hub / Centre
- Potential Reserve + Open Space
- Favourable topography
- o -> Key Amenity Views
- High-value properties with close proximity to open space and recreation
- ➔ Opportunity for a multi-modal spine road
- Potential new bus route connecting into existing Pinehaven community
- Potential future connection to Whitemans Valley / Blue Mountains Road
- ⌋ Potential opportunity for cycle connection to existing amenities





Concept Masterplan

03

3.1 Concept Masterplan

3.1.1 Overview

This concept masterplan has been developed through the contextual analysis including site visits and desktop studies and a visioning workshop with the Guildford Timber Company, and builds upon earlier site assessments and planning work. Over that time, GTC's earlier iterations of the Masterplan have been presented to the community and made available via the UHCC webpage about the Southern Growth Area and Silverstream Forest website. GTC has sought input from leading and trusted environmental experts and thinkers that New Zealand has to offer on its journey to masterplan the site.

These studies and assessments have included:

- Transport modelling
- Power
- Stormwater
- Waste water and water supply and other services
- Reverse sensitivity assessments including odour and noise
- Cost estimates to confirm feasibility
- Urban design
- RMA planning
- Ecology
- Consultation with the wider community and relevant stakeholders

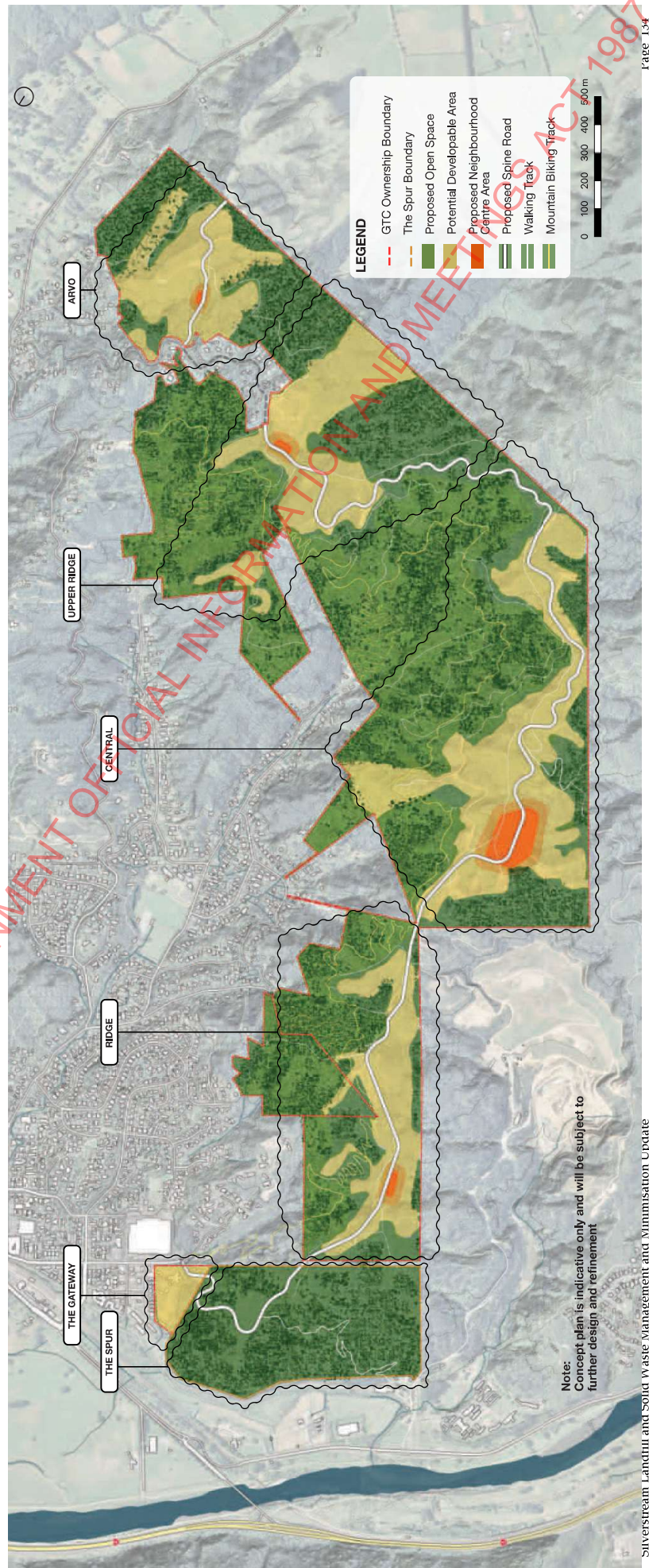
In line with the vision and principles of GTC, features of the proposed concept masterplan include:

- Embedded principles of sustainable design – architecture, landscape architecture, urban design and engineering, water sensitive urban design (WSUD), climate change adaptation and resilience and reduction of natural hazards.
- The potential to establish a reserve that covers a large proportion of the site, providing a network of walking and cycling routes for access and recreation.
- A series of thriving, interconnected neighborhoods that offer modern urban amenity within a forest setting and which are well-connected to the existing Pinehaven and Silverstream areas.
- Housing numbers to help to meet the predicted deficit in available homes in the Hutt in the medium term.

3.1.2 The Neighbourhood Areas

Silverstream Forest comprises development of six unique neighborhood areas, each with a distinct identity and offering a range of housing typologies and different residential proposition while retaining a cohesive identity as a new suburb for Upper Hutt.

- The Gateway – 44 Kln Street
- The Spur
- The Ridge
- Upper Ridge
- Central Forest
- Arvo



3.2

Zones

3.2.1

The Gateway

The Gateway provides a conclusion of the high density residential zone for Silverstream and entrance into the Southern Growth Area. It will include approximately 100 household units (a mix of apartment and townhouse development) and complementary mixed use commercial activities located minutes from the Silverstream Railway, expressway and existing Silverstream community. It is anticipated that a commercial or residential built edge will define the development and will use the spur as a back drop for providing apartment and or walk ups housing that is close to the shops and railway station.

3.2.5

The Spur

This site will not only provide the main infrastructure link into the Southern Growth Area

3.2.2

Ridge

The Ridge provides the first major residential village. The community will be defined by the forest edge and views out across the valley. Reserve edge housing will be provided similar to the Spur and using local access ways to minimise large local feeder roads. The development around the first community hub will be primarily terraced housing and the hub would potentially provide up to two story mixed use buildings. The primary road corridor with walking and cycling will connect to the spur open space and reserve tracks in this stage.

3.2.3

Central

This village is the main residential space and will provide the local economy for residents. While there will be areas of reserve edge housing, because of the views to the south and north and larger areas of flat land and topography that can manage larger building forms, this will be the most built up area of the Southern Growth Area. The community hub will be the largest and provide necessary services for the new residents in this community as well as spaces to connect. It is possible that up to 4 story mixed use buildings could be provided in this space. Around the community hub, walk ups may be considered as well as medium density housing in the remaining development areas. Recreation tracks will be guided through this village so residents can access key services through walking and cycling.

3.2.4

Upper Ridge

This village is more defined by the natural topography and regenerating forest opportunities. A major internal road will be built between the two villages and provide a transition from the busier central village into reserve edge housing and some levels of terraced housing as you lead up to a small community hub. Some rural lifestyle homes will be provided as well before the development connects back into the existing Arvo Road and then turns and provides for residential terraced housing that looks over the Mangaroa Valley. Walking tracks will be provided through the development to the 100 year plus native forest to the south of the property.

3.2.6

Arvo

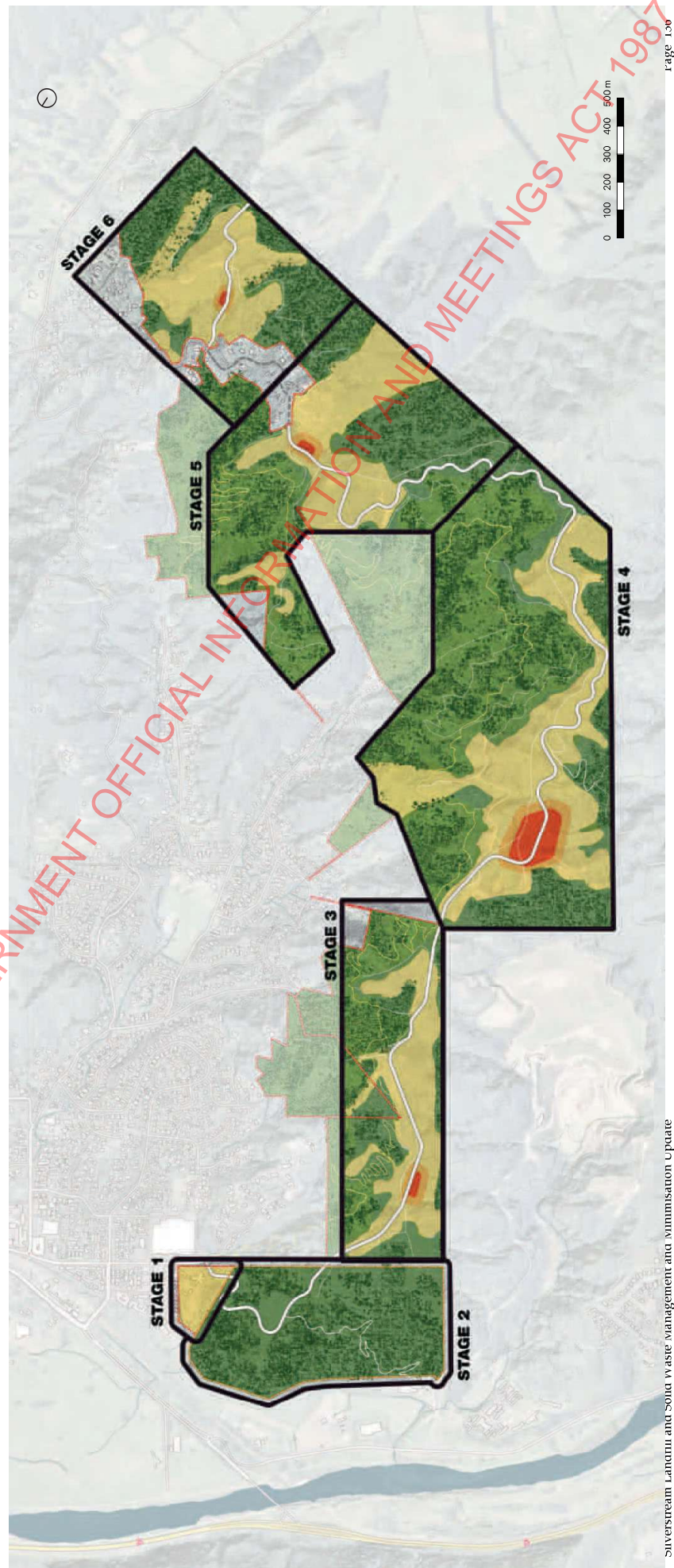
This is the last stage in the Silverstream Forest development, and will conclude with extending the construction of access road and services into the Arvo Road Precinct and construction of the dwellings. This area will provide for more lifestyle housing that is more consistent with a rural lifestyle zone with larger lots. Where appropriate houses will be clustered in the form of hamlets to minimise infrastructure but also provide connected communities on this north facing site, with views to the east towards Mangaroa.



3.3

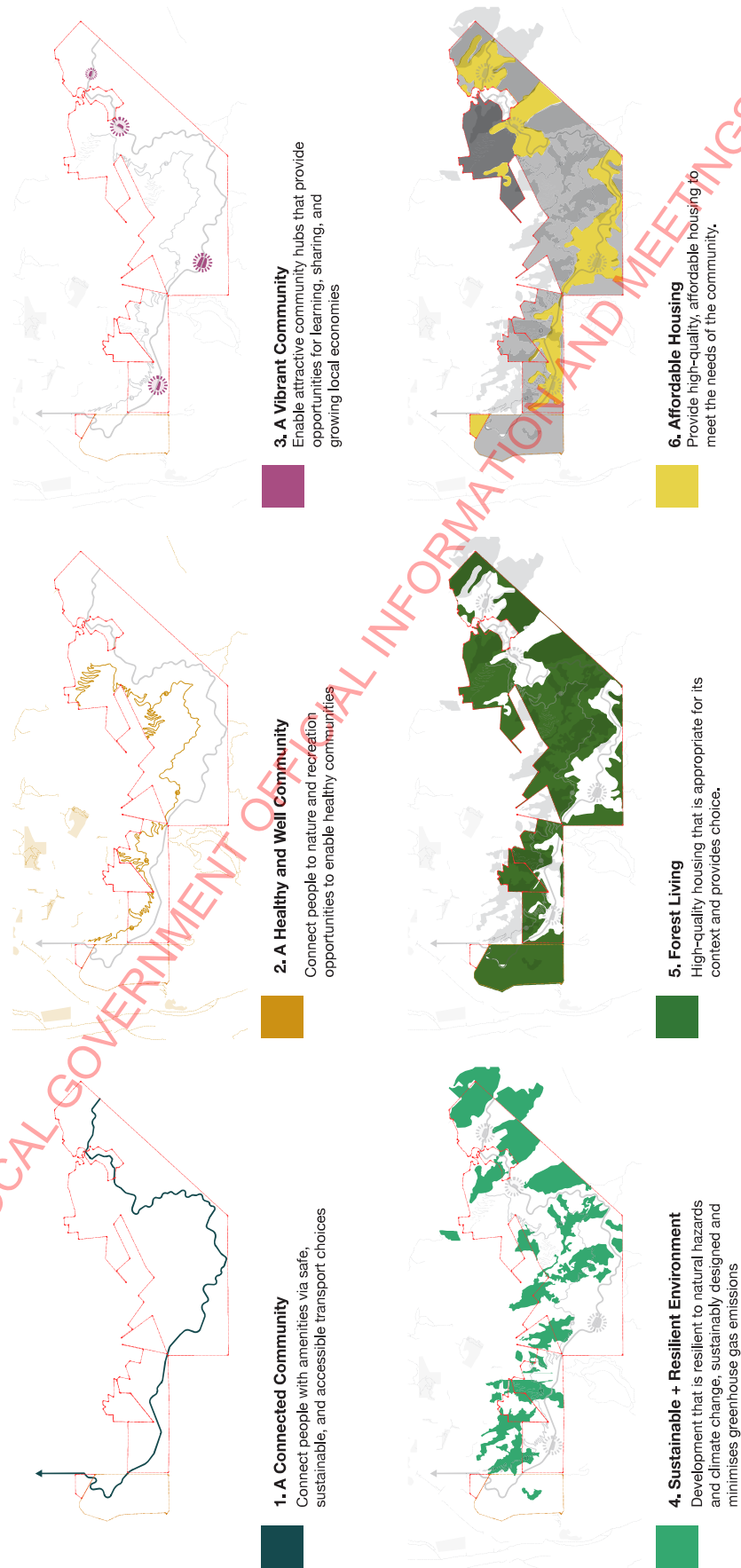
Masterplan Staging

The masterplan is proposed to be delivered across six stages of development, beginning with the Gateway (Kiln Street) in the north and completing at Arvo in the south.



3.4 Key Moves Summary

Underpinning our concept masterplan are the following key moves that are described below and developed further in the next stages of the masterplan.



3.5

Recreation

Connect people to nature and recreation opportunities to enable healthy communities.

Provide safe and well-connected public spaces and places that meet the community's needs. Along with the planned reserve this will include smaller open space and play areas within the new neighbourhoods.

A network of cycling and walking routes – on and off-road – will be developed to link into local and regional recreational routes such as connecting to Wainuiomata via the summit tracks as well as the Hutt Valley River Trail, Korau Recreation Reserve and up to the Remutaka Rail Trail.

These proposed recreational assets will have health, recreational, environmental, cultural and economic benefits for the community and the wider area.

3.5.1

Silverstream Forest Reserve

GTC will engage with mana whenua Taranaki Whānui ki te Upoko o te Ika, The Wellington Tenthis Trust and Ngāti Toa Rangitira to better understand their vision for the forest. There is an exciting opportunity to set up a community trust (or partnership) which could help design and develop the park for environmental, social, heritage conservation, public recreation, and enjoyment. Features of the reserve will include:

- Custodianship – possibility to partner with mana whenua and council, as well as local and regional groups such as Forest & Bird, as well as Greater Wellington Regional Council.
- Enhanced biodiversity and ecological corridors.

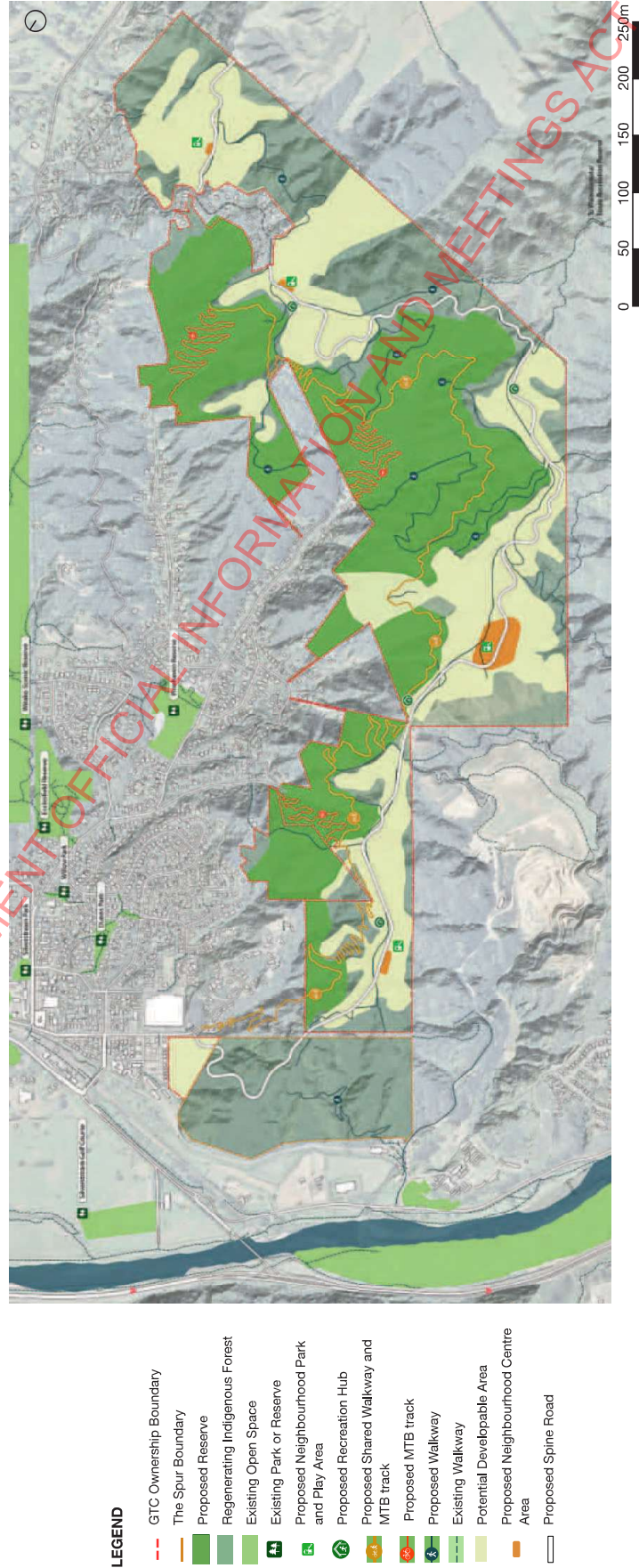


- Wayfinding and interpretational signage.
- A long-term Park/Reserve Management Plan.

3.5.2

Recreational hubs

To aid access to the reserve and recreational network a number of recreational hub facilities are proposed. These would serve as meeting places, start/end points for walks or bike rides and typically would include an open shelter structure, toilets, tap water, furniture, information, wayfinding and interpretative signage.



3.6

A Sustainable & Resilient Environment

Development that is resilient to natural hazards and climate change, sustainably designed and minimises greenhouse gas emissions.

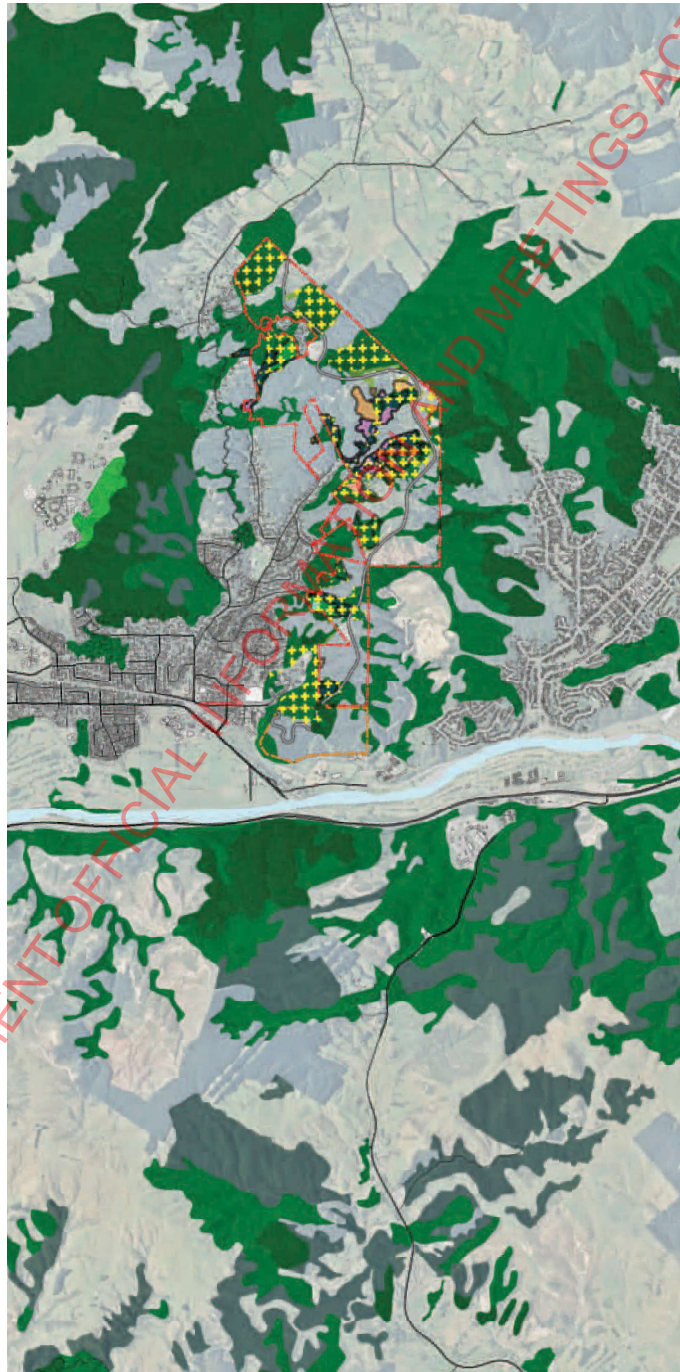
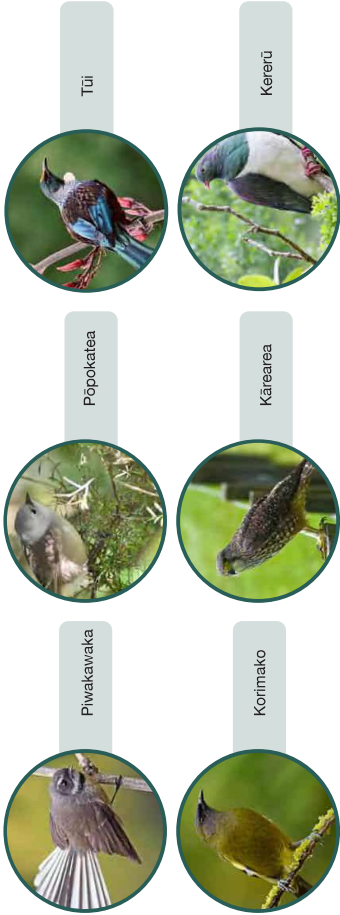
Good development includes providing homes with low carbon emissions (both in terms of embodied and operational energy) and designing healthy neighbourhoods with sustainable transport options and a resilience to climate change and natural hazards, such as flooding, drought and fire.

New Zealand has an international obligation to respond to the UN Sustainable Development Goals (SDG) and in particular:

- Meet the objectives of the Paris Agreement to limit global warming to 1.5-2°C above pre-industrial levels.

- Report on greenhouse gas emissions under the United Nations Framework Convention on Climate Change and the Kyoto Protocol.

New Zealand is on the path to a low emission, climate resilient future. The Government has declared a climate emergency and has committed to being Carbon Zero by 2050 and has established the Climate Change Commission to support this journey. In their first official report the Commission recommends increased urgency and action - "we need strong and decisive action to address climate change."



LEGEND

- GTC Ownership Boundary
- The Spur Boundary
- Broadleaved Indigenous Hardwoods
- Indigenous Forest
- Manuka and/or Kanuka
- Kamahi Forest w Emergent Pine
- Secondary Beech Forest
- Fernland
- River
- Draft Significant Natural Areas
- Draft Significant Natural Areas within the site
- Further strengthening of native Green Infrastructure Network within development

3.7

Climate Change Commission (CCC) Vision

The Climate Change Commission's vision is of a thriving, climate-resilient and low emissions Aotearoa where our children thrive.

This future for Aotearoa is equitable and inclusive, protects livelihoods and makes economic sense. It is also a future that is possible if we take opportunities to evolve and change.

It is a country where people are respected stewards of the land. Where an innovative and resilient food and fibre sector succeeds in a low emissions world. Where abundant native bush stores carbon and is home to native birds and plants. Where our plantation

forests support a flourishing bio economy, enabling low emissions construction, materials and energy.

Recommendations from the CCC report that can be incorporated into the Silverstream Forest development include:

- NZ Building Code must increase insulation & energy efficiency minimums.
- Consider EV plugs & access to EV charging in multi-unit housing.
- Native forests have added biodiversity & cultural benefits – over monoculture exotic plantations.
- Native forests require pest and predator control plus need to consider vulnerability of these carbon sinks to fire and disease.
- Considering future costs of carbon emissions in development feasibility – carbon accounting.
- Working from home and walkable neighbourhoods.

- Reduce emissions where feasible, use offset only for hard to abate sectors.

This requires communities around the country to have access to safe, convenient, well-integrated, affordable and accessible public or shared transport (including national public transport like trains and coaches), and extensive, high-quality cycling and walking infrastructure.

Silverstream Forest will include:

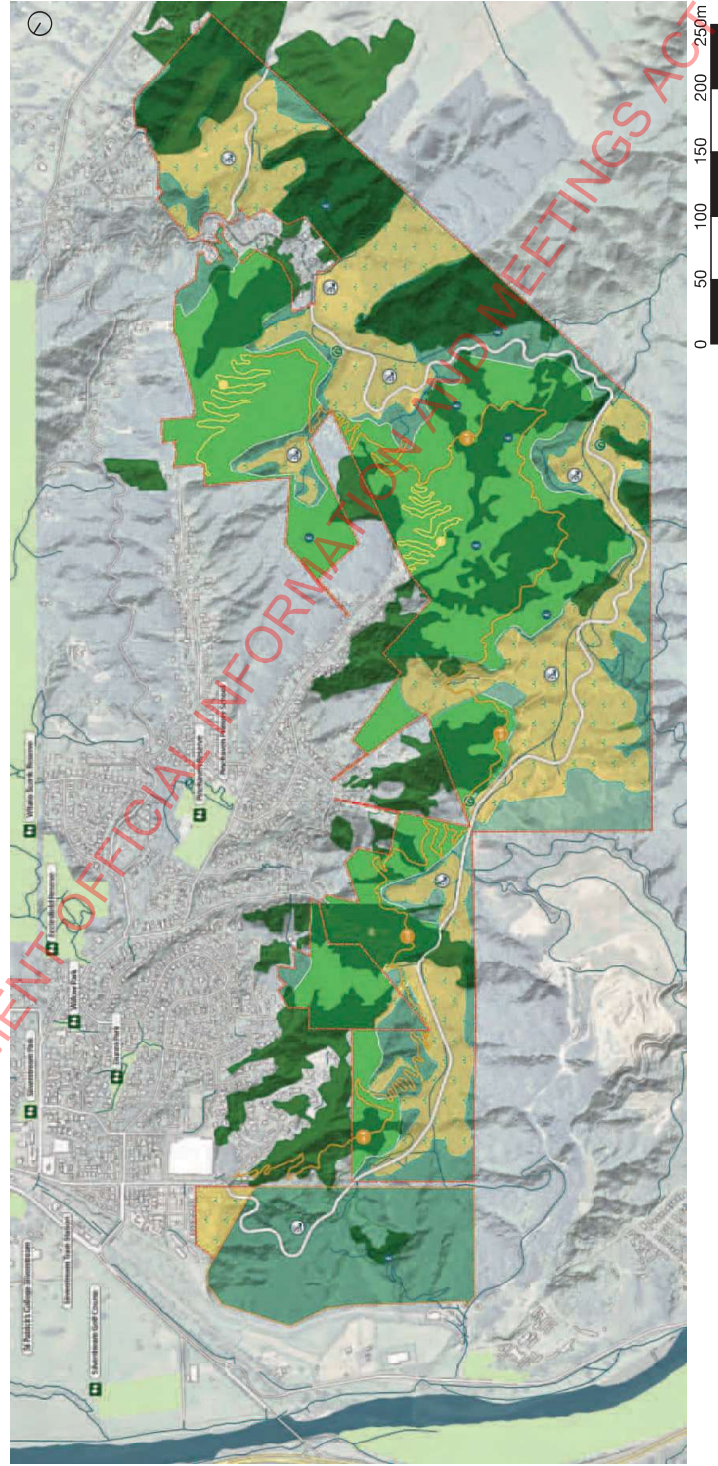
- Low-carbon strategies and targets for embodied and operational energy – low carbon materials and energy efficient buildings (See Forest Living below).
- Carbon Sequestration – opportunity to offset the carbon associated with the buildings.
- Setting aside significant areas of land for natural

processes, resulting in enhanced biodiversity of the area.

- Minimising development in areas identified as having significant indigenous vegetation and biodiversity values and areas of high amenity value.
- Creating more efficient homes and workplaces that use much less energy and water, are warmer, dryer and are better ventilated.

LEGEND

- GTC Ownership Boundary
- The Spur Boundary
- Water Sensitive Urban Area
- Significant Natural Area
- Proposed Reserve
- Regenerating Indigenous Forest
- Existing Open Space
- Existing Park or Reserve
- Proposed Recreation Hub
- Proposed On-lot Rainwater Collection
- Proposed Shared Walkway and MTB track
- Proposed MTB track
- Proposed Walkway
- Existing Walkway
- Proposed Spine Road



Appendix 1. WMMP Local Action Plan programme summary (WMMP 2023- 2029)

This dashboard provides an overview of Hutt City Council's Waste Management and Minimisation Plan (WMMP) work programme, showing the current portfolio of projects and business-as-usual activities planned and underway to deliver local and regional WMMP actions. In total, 26 projects are planned to support delivery of the Local Action Plan (LAP) actions, with 20 currently underway, three on hold, and three completed. A further eight activities are delivered on an ongoing business-as-usual basis.

Project Name	LAP action(s)	Regional/Local?	Stage	Project Description	Project Impact	Project update
Infrastructure						
EDL asbestos destruction demonstration (soil remediation)	11	Local Project	In progress	Trial Environmental Decontamination Limited's (DEL) technology to neutralise asbestos including soils contaminated with asbestos, to improve safe handling outcomes, preserve landfill airspace, and recover resources.	High Weight	The plant & equipment is expected to arrive at the Silverstream Landfill by early May. The resource recovery and comms & engagement team are working with EDL on a comprehensive comms plan that will include an official opening ceremony and site visits for stakeholders. The plant is expected to begin operations in late May.
Soil and aggregate recycling facility	11	Local Project	In progress	Work with partners to implement a soil and aggregate recycling facility (SARF) at Silverstream Landfill, supporting local circular economy outcomes, preserving landfill airspace, and reducing reliance on virgin materials.	High Weight	FH and HCC expect to hear the outcome of the Waste Minimisation Fund application in May. Background work is continuing on the commercial mechanisms to enable the build & operation of the SARF. If/once funding is approved.
Site remediation	21	Local Project	In progress	Identify and implement remediation options for closed landfill to manage legacy environmental risks.	Low Weight	A consent application is still under development, for remediation work at the closed Eastbourne landfill (eg top up cap, repair drains, etc). After an initial pre-application meeting with GWRC, the application is now scheduled to be submitted to Greater Wellington Regional Council by mid- 2026. Remediation work is tentatively scheduled for the 2026/27 construction season, pending consent confirmation, and finalising costs and budgets.
Resource Recovery infrastructure development (additional zero waste hub)	12	Local Project	Planning	Evaluate options and potentially implement an additional resource recovery facility, partnering with existing providers to strengthen network capacity and expand local reuse and recovery services.	Low Weight	In the planning/definition phase. Potential for a collaboration project with UHCC.
Business Engagement						
Business engagement	4	Regionally Coordinated	Planning	Develop a business engagement plan consistent with agreed regional approach.	High Weight	In planning/definition phase.
Business waste audits	4	Local Project	Planning	Deliver waste audits for participating businesses, with the aim of supporting businesses to identify practical opportunities to reduce waste and track progress over time.	Medium Weight	In planning/definition phase.
It starts with us - Internal waste minimisation project	2	Local Project	On hold	Implement waste minimisation initiatives across council facilities to reduce waste, increase resource recovery, and demonstrate council leadership by walking our talk.	Low Weight	As part of the It Starts With Us project (organisational behaviour change), waste systems at the Laings Road administration building were improved in collaboration with the Facilities team. Improvements included new bins for additional waste streams, clearer signage to support correct disposal, and consolidation of several streams to simplify separation and improve diversion. The project is intended for wider rollout across HCC sites but is currently on hold while other projects are prioritised.
CBD single-use transition engagement	4	Local Project	On hold	Transition Lower Hutt CBD toward a 'single-use free' city by supporting local businesses to embed lasting waste minimisation practices.	Low Weight	The Single Use CBD project is currently on hold and is intended to be picked up again as a component of the Business Engagement project.
Embedding waste reduction in procurements	2	Local Project	In progress	Implement a council-wide procurement policy that reduces waste across contracts and services, embedding circular economy principles into sourcing, delivery, and supplier expectations.	Low Weight	Updates to HCC's procurement policy and strategy are being progressed to better embed consideration of waste reduction opportunities across contracts and ensure procurements align with the C&D Bylaw requirements.
Community Impact						
R3 Waste Forum	6,8	Regional Project	In progress	Lead improvements to governance and enhance the Wellington region waste forum's effectiveness in communicating waste minimisation priorities and initiatives, while providing ongoing secretariat support.	Low Weight	The regional project to strengthen the Wellington Region Waste Forum is nearing completion. The intention is for the Waste Forum to be formally dissolved, and for new Terms of Reference to be approved. The forum would then operate under business as usual, with forums to be run every six months, led by a host council.

**Project Impact is calculated from a weighted formula that includes 'priority', 'diversion potential', 'reach', and 'budget'.*

Project Name	LAP action(s)	Regional/Local?	Stage	Project Description	Project Impact	Project update
Tikanga Māori Initiative(s)	1	Local Project	In progress	Provide support to local iwi groups and/or other organisations that provide tikanga Māori perspectives on waste minimisation initiatives.	Low Weight	The Resource Recovery team is actively working with the Council's Kāhui Mana Whenua group to identify opportunities for partnership for Lower Hutt based Tikanga Māori initiatives related to circular economy.
Campaign: Behaviour change	7	Local Project	Planning	Implement a city-wide waste minimisation campaign to drive behaviour change and improve community outcomes through coordinated engagement and education.	Medium Weight	Initial scoping is being undertaken to develop a brief for a potential waste minimisation behaviour change campaign, which would then be progressed through an external behaviour change agency.
Community grant fund (waste minimisation)	5	Local Project	On hold	Establish a community waste minimisation grant fund for Lower Hutt to resource community/local-led projects that reduce waste, increase reuse and recovery, and deliver measurable outcomes.	Medium Weight	The community waste minimisation grant fund is currently being scoped, including defining objectives, eligibility criteria and funding level. Full development will commence after the TOM is implemented, with delivery options and resourcing requirements to be confirmed.
Evidence, Strategy and Planning						
SR3 Contaminated soil	12	Regional Project	In progress	Lead a regional investigation into the volumes, sources, contamination profiles, and current disposal pathways for contaminated soil, identifying system-wide opportunities to enable diversion from landfill	Medium Weight	Scope is being finalised, and the next step is procurement to appoint an external provider to deliver the project, supported by participating councils.
Future of residual waste	11	Regional Project	Planning	Undertake an investigation to assess and project the regional flow of waste and the current and future infrastructure and services required to manage known and future residual waste streams (including disposal or alternatives). HCC leads this regional project.	High Weight	An updated project scope that would enable better analysis of potential pathways for residual waste and the impact of increased diversion opportunities is with the Regional Steering Group for sign off. This also involves changing the title to "Future Waste Pathways" to better reflect the intent of the project. Once this is completed, officers from across the regions can workshop and refine the modelling and plan for procurement for an options analysis.
Local waste in emergency planning	21	Local Project	In progress	This project involves working with Tonkin and Taylor to prepare operational plans for the activation of identified temporary debris disposal sites. It also encompasses other local tasks to find or develop key planning documents for contributing to the regional waste in emergencies project.	Medium Weight	Following an initial draft and workshop with experts, Tonkin and Taylor have provided an updated draft operational site plan that can be used to guide contractors when activating temporary disposal sites in the case of an emergency. Officers also met with the lead for the Cyclone Gabrielle Debris Taskforce and this discussion has informed feedback on the draft operational site plan with practical recommendations and has been fed back to the regional working group.
Policy						
Bylaw Implementation (C&D waste)	9	Regionally Coordinated	In progress	Implement the Construction and Demolition (C&D) provisions in the Waste Management and Minimisation bylaw 2021, requiring the submission of a Waste Management Plan for building projects valued over \$2M.	High Weight	The core process design for implementation has been completed and agreed across the region, alongside the development of a Waste Management Plan template. A communications and engagement plan is in place, with supporting deliverables in development. Internal processes are being refined to support rollout.
Bylaw implementation (minimising event waste)	9	Local Project	In progress	Implement the event provisions in the Solid Waste Minimisation and Management bylaw 2021, working with partners to support organisers with compliance, and lift waste minimisation standards for events in Hutt City.	Medium Weight	Following a successful trial of event waste minimisation and resource recovery support, procurement has been completed to secure a delivery partner for ongoing implementation of the event waste bylaw provisions. Nonstop Solutions has been appointed and contract has been signed. The contract will expand support for large and small events across the city, building consistent capability among event organisers through education and practical guidance to improve waste reduction and resource recovery outcomes.
Bylaw review	9	Regionally Coordinated	Not yet started	Undertake a regionally coordinated statutory review of Council's Solid Waste Management and Minimisation Bylaw 2023-2029 to ensure it remains fit for purpose, aligned with regional priorities, and continues to provide an effective regulatory framework.	Medium Weight	Planned, subject to regional agreement on approach and timing.
Service Transformation						

Project Name	LAP action(s)	Regional/Local?	Stage	Project Description	Project impact	Project update
FOGO kerbside collection and processing	14	Sub-regional Project	In progress	Plan and potentially implement a kerbside food and green organic waste (FOGO) service, including identifying and securing a fit-for-purpose processing solution.	High Weight	The final stage of the procurement process ended in March 2026. The evaluation panel's recommendation and next steps for the project will be presented to Council on 7 May. The outcome is that none of the offers met Council's requirements and cost expectations. Planning is underway to identify alternative opportunities to help divert organic waste from landfill.
Kerbside - Contamination reduction	19	Local Project	In progress	Deliver a targeted campaign that reduces contamination, and improves the effectiveness of HCC's kerbside recycling collection service.	High Weight	Summer media campaign re-using existing assets outperformed benchmarks and gave additional value for money with "roll-on" weeks. Targeting the assets at problem materials like nappies and tetrapaks also gave better data on reach with different audiences to help inform where more clarity is needed. FAQ documents are with staff in hubs and libraries and have been sent out to property managers. Refreshed data analysis on hotspots and collection routes with higher scoop test results is also underway.
Battery Recycling	12	Local Project	In progress	Implementing battery recycling collection services in HCC hubs and libraries to improve access, increase recovery, and keep hazardous materials out of homes and landfill.	Low Weight	Following the successful trial, four additional battery collection units have now been installed at Waiuomata Neighbourhood Hub, Walter Nash Centre, Hutt City Councils admin building, and Kōraunui Stokes Valley Neighbourhood Hub, bringing the total number of HCC supplied units to seven.
Silverstream resource recovery improvements	12, 20	Local Project	In progress	Improving the Silverstream Transfer Station layout and signage to improve site operations and expand waste stream diversion options.	Medium Weight	The Silverstream Transfer Station layout has been updated to improve traffic flow and customer access while enabling expanded resource recovery. New dedicated areas for additional material streams (plate glass, tyres, and native timber) support increased diversion to help preserve landfill airspace. Supporting signage has been installed to guide correct material separation and promote diversion incentives.

BAU				
Regional project contributions	6, 12	Regionally Coordinated	BAU	Provide or coordinate strategic input and technical expertise to support delivery of 18 regional WMMP initiatives led by HCC or partner councils, helping align projects and maximise shared outcomes. This includes for example, data alignment regionally and waste in emergencies planning.
Central government advocacy	10	Local Project	BAU	Coordinate advocacy to central government from a regional or local perspective as appropriate, to influence policy and investment decisions that support waste minimisation outcomes.
Achievement sharing	8	Local Project	BAU	Share achievements in waste reduction and resource recovery from HCC and partner organisations.
Bylaw Implementation (MUDs)	9	Regionally Coordinated	BAU	Ensure new and redeveloped MUDs meet bylaw requirements for waste and recycling infrastructure, supporting consistent service provision for residents.
Enviroschools	7, 1	Local Project	Contract	HCC supports waste and environmental education across Lower Hutt through the Enviroschools programme and World of Waste tours for early childhood centres, kura and schools. The programme supports tamariki and rangatahi to build knowledge and capability around waste minimisation, sustainability and kaitiakitanga through practical learning, school-led action, and visits that connect learning to local waste and resource recovery systems.
Earthlink voucher scheme	12, 20	Local Project	Contract	The Earthlink voucher scheme at the Silverstream transfer station incentivises customers to separate their loads and divert recyclable and reusable materials from landfill. Customers who sort eligible items receive a discount voucher, supporting increased resource recovery.
SeatSmart	12	Local Project	Contract	The SeatSmart contract, delivered through Earthlink, supports the collection and recycling of used car seats.
Sustainable Coastlines	17, 18	Local Project	Contract	This contract with Sustainable Coastlines supports regular beach clean-ups across key coastal locations in Lower Hutt, removing litter and marine debris from the environment. It also provides monthly litter monitoring and reporting at selected sites to identify hotspots and trends and inform targeted litter prevention responses.

Completed projects						
Project Name	LAP action(s)	Regional/Local?	Stage	Project Description	Project impact	Project update
Infrastructure						
EV Charging Hub and landfill electrification	20	Local Project	Completed	Install EV Charging Hub for heavy vehicles and machinery at the Silverstream Landfill.	High Weight	Construction of the Heavy EV Charging Hub was completed in 2025, and the hub was officially opened on 3 February 2026. WM is now operating a 20t electric loader on site, and a further two kerbside trucks utilise the hub daily for overnight charging. A further two EV charger satellites are due to be installed by May 2026, to enable charging of an additional two kerbside trucks. Officers are working with WM to consider the next tranche of on-site machinery and/or vehicles due for electrification.
Clean up the Hutt event	5, 7	Local Project	Completed	Clean up the Hutt is a partner-led initiative that delivers litter clean up and waste minimisation events across multiple Lower Hutt suburbs.	Medium Weight	More than 300 people took part in Clean Up the Hutt on Saturday 13 December 2025, collecting over 2.5 tonnes of rubbish and recycling from rivers, coastline and open spaces across Lower Hutt, both above and below water. The event was supported by Council and delivered by Sustainable Coastlines and Conservation Volunteers New Zealand, with contributions from business sponsors.
C&D commercial solution	13	Local Project	Completed	Pilot a recovery solution for mixed commercial C&D waste loads at Silverstream Landfill, testing diversion pathways and operational logistics to inform a scalable long-term approach.	Medium Weight	The project has been completed. The project did not attain the objective of transporting between 5 and 10 hook bins of comingled C&D Waste to Central Environmental (Fielding) for diversion. However, the learnings from preparation and operational stages have been significant and highlight the barriers and challenges to diverting C&D waste in the Lower Hutt and the Wellington region.

MEMORANDUM

145

07 May 2026

TO: Chair and Members



Infrastructure and Regulatory Committee

FROM: Jessica Hayman, Senior Advisor Waste - Planning and Strategy

DATE: 10 April 2026

SUBJECT: RETROSPECTIVE APPROVAL FOR FUTURE OF SPICER OPTIONS SUBMISSION

Purpose of Memorandum

1. The purpose of this memorandum is to present the Committee with a submission to Porirua City Council (PCC) on the consultation for Spicer Landfill Future Options, and to seek the Committee's retrospective approval for this submission.

Recommendations

That the Committee:

- (1) notes and receives the memorandum; and
- (2) retrospectively approves the submission to the consultation on the consultation for Spicer Landfill Future Options attached as Appendix 1 to the memorandum.

Background

2. The consents for Spicer Landfill operations will now expire in 2030. The consultation presented four options for the future use of the landfill site as set out below:
 - a. Option A – Public refuse transfer station for residents and small businesses (with recycling drop-offs and green waste. Waste would then be transported to another landfill.
 - b. Option B – Public and heavy vehicle refuse transfer station that is similar to Option A but includes commercial waste from large trucks.
 - c. Option C – Public and heavy vehicle refuse transfer station with clean fill disposal. This would be the same as Option B, but also adds a clean fill landfill.
 - d. Option D – Close Spicer Landfill with no replacement service.

3. Key points from Council's submission were that it:
 - a. **Supports** Options C, B and A in that order of preference, but do not support Option D, in which PCC plays no part in diverting waste from the region's other landfills. This reflects a preference for the options that enable increased waste minimisation and resource recovery outcomes. PCC's focus should be on establishing a state-of-the-art resource recovery hub, with a co-located transfer station, as opposed to a transfer station with some recycling drop offs.
 - b. **Requests** that PCC continue to coordinate and collaborate closely across the region to improve regional waste stream data and support strategic projects for the future of waste pathways and priority materials for recovery.
 - c. **Requests** that PCC share any data to estimate how much waste will require disposal elsewhere post-closure.
 - d. **Notes** that any waste from Porirua that will be redirected to Silverstream landfill following the closure of Spicer landfill would reduce the remaining life of Silverstream.
 - e. **Requests** that PCC prioritise and invest in opportunities to improve resource recovery across the range of waste streams, not just those that may be targeted in the context of zero waste hubs at transfer stations. This is important to offset the impact of Spicer's closing in 2030.
4. Submissions on the consultation closed on 25 March 2026, approximately six weeks before the Infrastructure and Regulatory meeting. To ensure Council could have its say, the submission was submitted to PCC on Wednesday, 25 March 2026, and retrospective approval is being requested.
5. The submission was approved by Chair Cr Edwards and Deputy Chair Cr Lewis in lieu of a scheduled committee meeting.
6. The submission is attached as Appendix 1 to the memorandum.

Appendices

No.	Title	Page
1	Appendix 1: Hutt City Council Submission on Future of Spicer Landfill Options Consultation	147

Author: Jessica Hayman, Senior Advisor Waste - Planning and Strategy

Reviewed By: Jörn Scherzer, Head of Climate, Waste and Resource Recovery

Approved By: Jarred Griffiths, Director Strategy and Engagement



By email

25 March 2026

Email to: submissions@porirua.govt.nz

Tēnā koutou katoa,

Spicer Landfill Future Options

1. Hutt City Council (HCC) welcomes the opportunity to provide feedback on the Spicer Landfill Future Options Consultation Document (Consultation Document).
2. HCC's role in waste management and resource recovery includes ownership of Silverstream Landfill (Silverstream), operation of a kerbside waste, recycling and green waste collection service, and investigating, trialling, and implementing a range of initiatives to increase resource recovery.
3. Councils across Wellington Region, including Porirua City Council (PCC) and HCC work together to implement the 2023–2029 Waste Management and Minimisation Plan (WMMP) that recognises the need to reduce the amount of waste generated and sent to landfill in the region, and accordingly sets joint targets agreed by all partner councils. This work is crucial to increase the prevention and diversion of waste to use the remaining airspace of the region's landfills carefully for our communities. HCC urges PCC to consider the various commitments made under the WMMP as they evaluate future options for Spicer Landfill, including to reduce emissions from the transport of waste and the amount of organic material disposed to landfill.

Background

4. There are three Class 1 landfills (Silverstream, Southern and Spicer) in the Wellington Region that accept municipal solid waste. Any changes to the operating model or capacity of one of these landfills can inevitably impact the flow of waste to, and resulting capacity of, nearby landfills.
5. Silverstream Landfill is in Lower Hutt and caters to the disposal needs of communities and businesses from Lower Hutt and Upper Hutt and other

neighbouring cities and districts like Porirua, as well as waste transported from further afield that may require special waste handling at this facility.

6. Silverstream already receives approximately 135,000 tonnes of waste per year. Once Spicer Landfill (Spicer) closes in 2030, an estimated 40,000 tonnes of additional waste per year may be disposed at Silverstream. Assuming business as usual and no additional diversion, then this would have a measurably negative impact on the remaining lifespan of Silverstream – potentially reducing Silverstream’s remaining life by up to 7 years.

Support for Options A, B and C, but with a step change in diversion opportunities

7. HCC supports Options A, B and C in the Consultation Document due to the opportunities that these options present for continuing (and ideally increased) sorting and diversion of materials onsite in Porirua prior to the transport of residual waste to landfills, which may include Silverstream. This includes domestic drop offs and resource recovery as well as potential for future processing of divertible material from commercial loads and clean fill.
8. Of these three options, HCC supports Options B and C to a greater extent as these would enable greater diversion opportunities.
9. But when considering Options A to C, HCC encourages PCC to think far beyond the establishment of a simple “transfer station”.
10. For Option A, Hutt City’s experience demonstrates that active engagement at its Zero Waste Hub has significantly lifted resource recovery. Hence, the focus, if Option A is chosen, should be on the establishment of a state-of-the-art resource recovery hub, with co-located transfer station, as opposed to a transfer station with recycling drop offs. The focus should also be on actively working with hub users to divert, rather than simply relying on users to determine themselves what can be recovered. HCC would be pleased to share its experience with its discount voucher scheme to encourage improved resource recovery.
11. Aside from standard recyclable materials, PCC may also wish to consider locating significant resource recovery opportunities after the weighbridge (as is the case at Silverstream), as this avoids users simply bypassing any “free” diversion opportunities when they are simply not aware of what can

be recycled or recovered. The use of a discount voucher then appropriately incentivises users to divert, whereas a voucher cannot be implemented at a “free” drop off.

12. Further to this, for Option B, there is a need to think beyond the transfer of waste, but to also enable and maximise sorting of waste and then to direct the resulting waste and material streams to either resource recovery or disposal. This is crucial to offset the impact of closing the Spicer site and reduce pressure on the region’s waste infrastructure. This could occur either at the Spicer site through relevant processing infrastructure, or in conjunction with private operators, such as the new Construction & Demolition processing facility operated by WasteCo. Enhanced resource recovery could reduce the amount of residual waste requiring disposal and hence reduce pressure on remaining landfills such as Silverstream.
13. With regards to Option C, HCC notes that it does not operate a cleanfill of its own, but certainly prefers any initiative which deals with cleanfill materials close to source (noting WMMP goals to reduce emissions from the transport of waste). The Class 1 Silverstream Landfill is certainly not an appropriate destination for cleanfill waste. HCC supports PCC providing a local solution if it able to do so.
14. Option D is unpalatable to HCC as it may result in the redirection of additional materials including tyres, hazardous and green waste and even bulk recycling to Silverstream Landfill, which would be an inappropriate outcome for those materials.

Request for close coordination and collaboration

15. In light of the potential impact that Spicer’s closure may have on the life of neighbouring landfills, HCC requests that PCC continues to coordinate with officers across the region to improve regional waste stream data and support strategic projects for future of waste pathways and priority materials for recovery.
16. HCC also requests that PCC enables effective infrastructure planning for Silverstream and other landfills by sharing any data (where appropriate) to estimate how much waste will require disposal elsewhere post-closure.

Where this data has not been collected, HCC encourages PCC to establish relevant information, such as the geographic source of current disposed waste, and support communication in advance (wherever possible and appropriate) when users of Spicer express an intention to dispose at Silverstream after 2030. This is to help estimate the amount of waste that may be redirected to Silverstream.

17. Whatever option is chosen, HCC would appreciate an opportunity to work closely with PCC to identify ideal pathways for various collected materials, with an aim to diverting as much as possible from Silverstream Landfill and maximising the landfill's potential to continue collecting only non-recoverable residual waste

Step change in resource recovery for other waste streams

18. PCC was previously involved in the project to develop processing infrastructure for food and green organics (FOGO), in light of the potential future implementation of a relevant residential service.
19. HCC encourages PCC to relook at this opportunity, particularly considering its previous proposal to introduce a rates-funded kerbside collection service similar to Hutt City's service. The addition of a FOGO service has the potential to reduce the amount of organic material that requires landfill disposal. Acknowledging the methane emissions produced by sending FOGO to landfill, it would be hard to justify accepting another city's food and green organic waste in future if HCC were diverting its own.

Silverstream pricing and waste acceptance

20. In New Zealand, there has long been a trend toward fewer and larger landfills. This recognises the fact that it is neither effective nor efficient for every local authority to have their own landfill, due to geological, regulatory and other factors.
21. This is also reflected at Silverstream, which receives waste not just from Lower Hutt, but from other districts within the Wellington region and further afield, particularly for special waste subject to specific regulatory requirements.

22. However, as the owner of Silverstream, HCC also has an objective that by taking waste from other areas, this does not adversely affect its own rate payers. Once Silverstream is full, it will likely not be possible to consent another municipal landfill in Lower Hutt. This would mean that any waste from Lower Hutt would have to go somewhere else, likely at additional costs (e.g. due to transport costs).
23. Importantly, by avoiding waste and improving resource recovery, the future closure date of Silverstream landfill could be extended. HCC's pricing and waste acceptance levers will be key tools for ensuring the landfill capacity is used effectively and avoid adverse consequences for ratepayers.
24. Further to the earlier points in this submission, it will be important for PCC to invest in a step change in resource recovery, and to continue collaborating on waste minimisation initiatives, to ensure it plays its part in reducing waste as much as possible.

Summary of key points

25. By way of summary, Hutt City Council:
- a. **Supports** Options C, B and A in that order of preference, but do not support Option D in which PCC plays no part in diverting waste from the region's other landfills. This reflects a preference for the options that enable increased waste minimisation and resource recovery outcomes. In particular, PCC's focus should be on establishing a state-of-the-art resource recovery hub, with co-located transfer station, as opposed to a transfer station with some recycling drop offs.
 - b. **Requests** that PCC continue to coordinate and collaborate closely across the region to improve regional waste stream data and support strategic projects for future of waste pathways and priority materials for recovery.
 - c. **Requests** that PCC share any data to estimate how much waste will require disposal elsewhere post-closure.

- d. **Notes** that any waste from Porirua that will be redirected to Silverstream landfill following the closure of Spicer landfill would reduce the remaining life of Silverstream.
- e. **Requests** that PCC prioritises and invests in opportunities to improve resource recovery across the range of waste streams, not just those that may be targeted in the context of zero waste hubs at transfer stations. This is important to offset the impact of Spicer closing in 2030.

26. Thank you for this opportunity to provide feedback on the Spicer Landfill future options. Hutt City Council officers are available to meet and speak to this submission.

Ngā mihi,

s7(2)(a)

Jörn Scherzer

Head Of Climate, Waste and Resource Recovery
Hutt City Council



Infrastructure and Regulatory Committee

29 April 2026

Report no: IARC2026/2/124

Report back on the proposal to introduce a food and green organics collection service

Purpose of Report

1. The purpose is to provide the Committee with information on the outcome of the procurement process for a regional organic waste processing solution, in relation to the proposal to implement a food organics and green organics (FOGO) collection service, and to provide advice on the next steps.

Recommendations

That the Committee:

- (1) notes the previous work undertaken and advice provided in relation to the intention to implement a food and green organics collection service in Lower Hutt;
- (2) notes the outcome of the food organics and green organics (FOGO) processing solution procurement process and the panel's recommendation not to progress with any supplier, as none of the supplier responses fully met Council's requirements or cost expectations;
- (3) agrees that implementation of a kerbside FOGO service is not currently feasible due to the absence of a processing solution in the near term; and
- (4) notes that officers will provide a briefing in the coming months regarding options to divert organic material from the landfill, in the context of reducing emissions and extending the remaining life of Silverstream landfill.

Background

2. In early 2022, in line with Council's carbon reduction and waste minimisation plans and targets, work commenced on a business case regarding the potential diversion of food and green organics from landfill disposal.
3. The introduction of a FOGO service to complement the existing rubbish and recycling kerbside service could significantly reduce the amount of kerbside

waste that requires landfilling and hence reduce greenhouse gas emissions. It would also align Lower Hutt with other cities in New Zealand that already have such a service.

4. As a result of the business case work, both Council and Wellington City Council (WCC) agreed to include the implementation of a FOGO service in their respective Long Term Plans (LTP), subject to completing further work, including responding to various questions, and undertaking a procurement process to identify a feasible and cost effective processing solution.
5. In November 2024 and February 2025, officers reported back to Council with additional information in order to respond to various questions from elected members (refer [CCASC2024/5/310, pages 21-22](#); and [LTPAP2025/1/36, pages 366-597](#)).
6. In parallel, over the last two years, HCC and WCC conducted a joint four-stage procurement process to identify a preferred organic waste processing solution.

Outcome of the joint procurement process

7. The procurement process to identify an organic processing solution concluded in March 2026.
8. Four suppliers were invited to submit a Request for Proposal (RfP) for the final fourth stage of the procurement process. Each invited supplier was pre-qualified as part of the prior three stages. The RfP asked respondents to propose an organics processing system that provided a 'Complete Solution', with the following requirements:
 - a. A fully enclosed processing facility at a suitable site and location that can be consented for a period of not less than 20 years;
 - b. A fully enclosed consolidation facility for bringing together FOGO at a centralised point, from where it can then be transported to the processing facility;
 - c. Selection of the most appropriate processing technology, including full odour containment;
 - d. A suitably qualified and experienced operator; and
 - e. Sustainable end markets that are available for all finished products
9. Evaluation was undertaken by a procurement panel involving six persons, including representatives from each of the two councils, and two independent experts. Probity advice was provided by Audit NZ.

10. As a result of the evaluation, the panel unanimously agreed that none of the proposals met all Council's key requirements for quality, feasibility and cost expectations and recommended *not* progressing with any supplier. This recommendation was accepted by the joint WCC/Council procurement oversight group.
11. Importantly, none of the suppliers offered a solution in line with cost expectations. Processing costs were originally estimated at approximately \$145 per tonne, but the lowest quoted cost was \$295 per tonne. On this basis, the evaluation panel assessed all solutions proposed as unaffordable.
12. Participating suppliers were informed of that outcome at the end of March 2026.
13. Without a processing solution, it is not possible to consider the implementation of a FOGO kerbside collection service in the near term.

Way forward

14. Notwithstanding the unsuccessful procurement process, the rationale for diverting organic waste from landfills remains valid, in terms of avoiding methane emissions from disposing this waste in landfills, and to extend the life of existing landfills, in line with Council's Waste Management and Minimisation Plan (WMMP) 2023-29.
15. This includes the target to reduce the total amount of organic waste disposed to landfill by 50% by 2030, and reducing the total amount of material that requires disposal to landfill by 30% by 2030.
16. As part of addressing this long-term challenge, officers will provide a briefing in the coming months regarding options to divert organic material from the landfill. Where possible, officers will aim to provide indicative costings, and an assessment of whether any of these are realisable within the next 3-5 years.

Risks

17. As part of its Waste Management and Minimisation Plan (WMMP) 2023-29, Council committed to a regional target to reduce emissions from biogenic methane by reducing the total amount of organic waste disposed to landfill by 50% by 2030. Council also committed to a supporting regional sub-target to have an organics processing facility available by 2029.

18. Considering the procurement outcome, it is now highly unlikely that a facility will be delivered within that timeframe. It is also highly unlikely that the 50% diversion target can be achieved. This is not only due to the missed opportunity to increase food and garden waste recovery in the residential sector, but it is also due to losing the key enabler for the commercial sector to increase organic waste diversion.

Climate Change Impact and Considerations

19. Not increasing the diversion of organic waste material disposed in landfills will mean that greenhouse gas emissions cannot be reduced.

Consultation

20. Not applicable

Legal Considerations

21. There are no legal considerations at this stage.

Financial Considerations

22. Considering the lack of a processing solution in the near term, budgeted costs to implement a FOGO service (opex and capex) could be removed from Council's budgets.

Target Operating Model (TOM) Implications

23. There are no TOM implications at this stage.

Appendices

There are no appendices for this report.

Author: Jörn Scherzer
Head of Climate, Waste and Resource Recovery

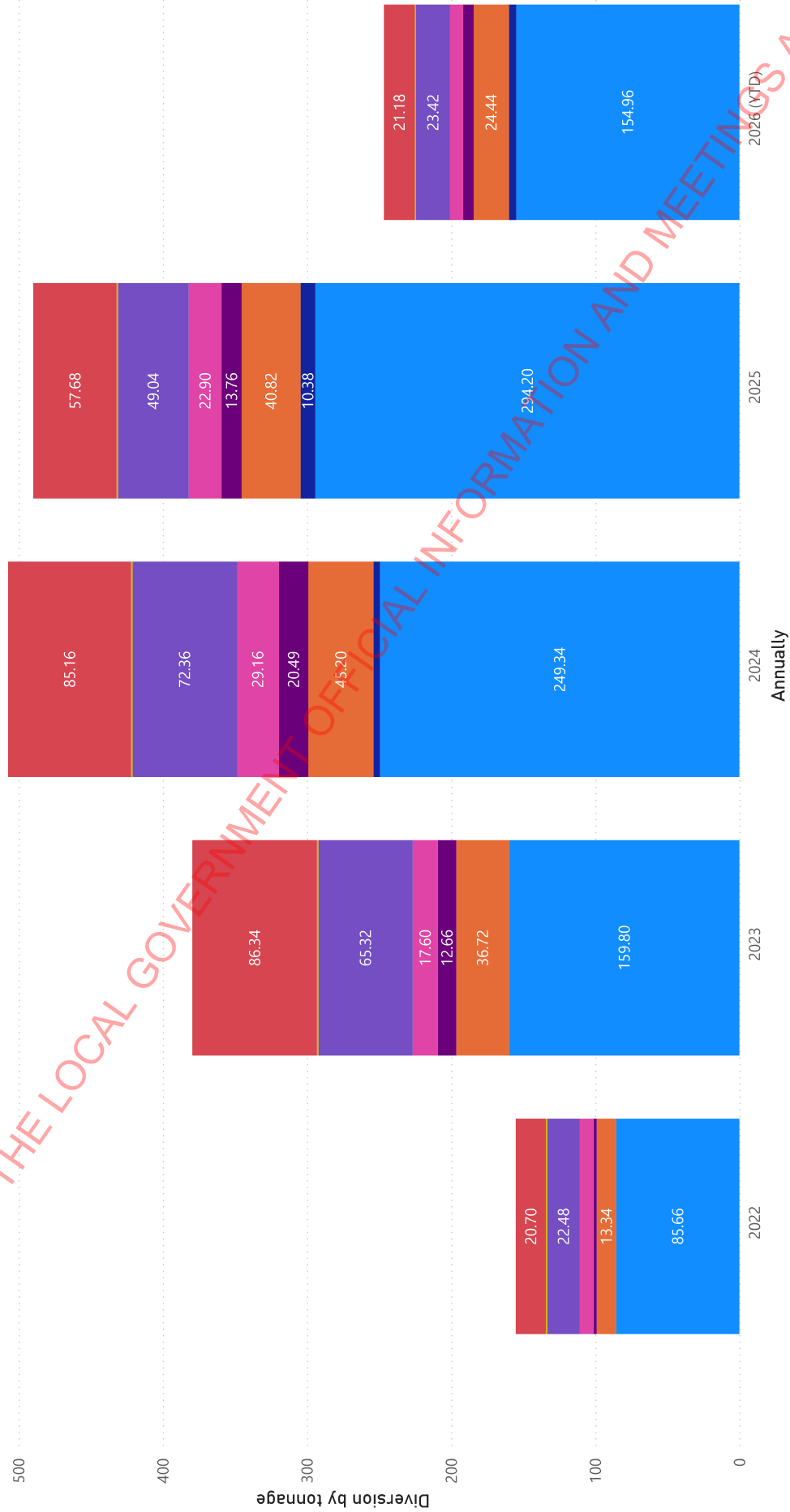
Author: Libby Frude
Advisor Resource Recovery

Approved By: Jarred Griffiths
Director Strategy and Engagement

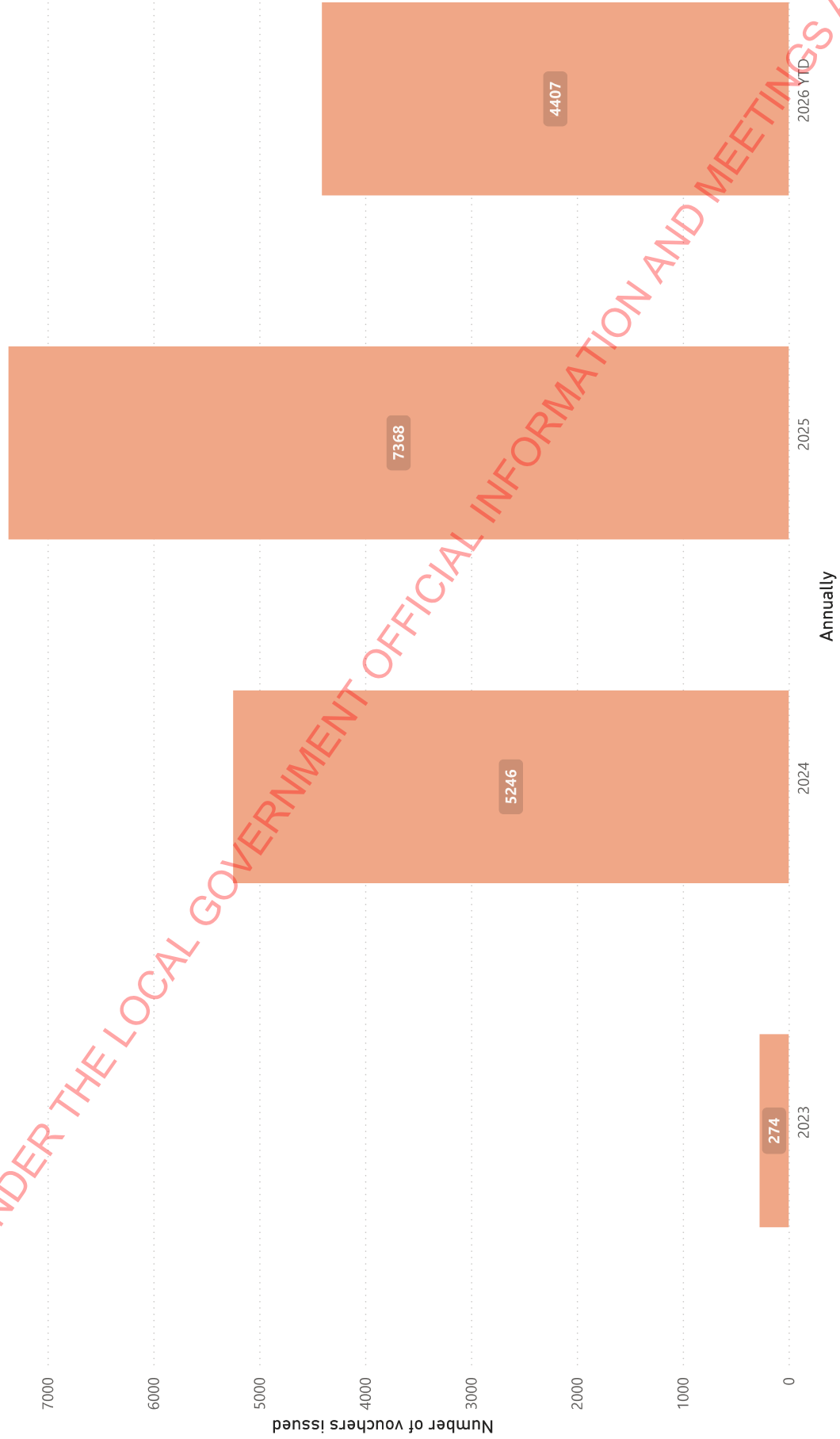
Silverstream Landfill Transfer Station Diversion from July 2022 - April 2026

Document 24

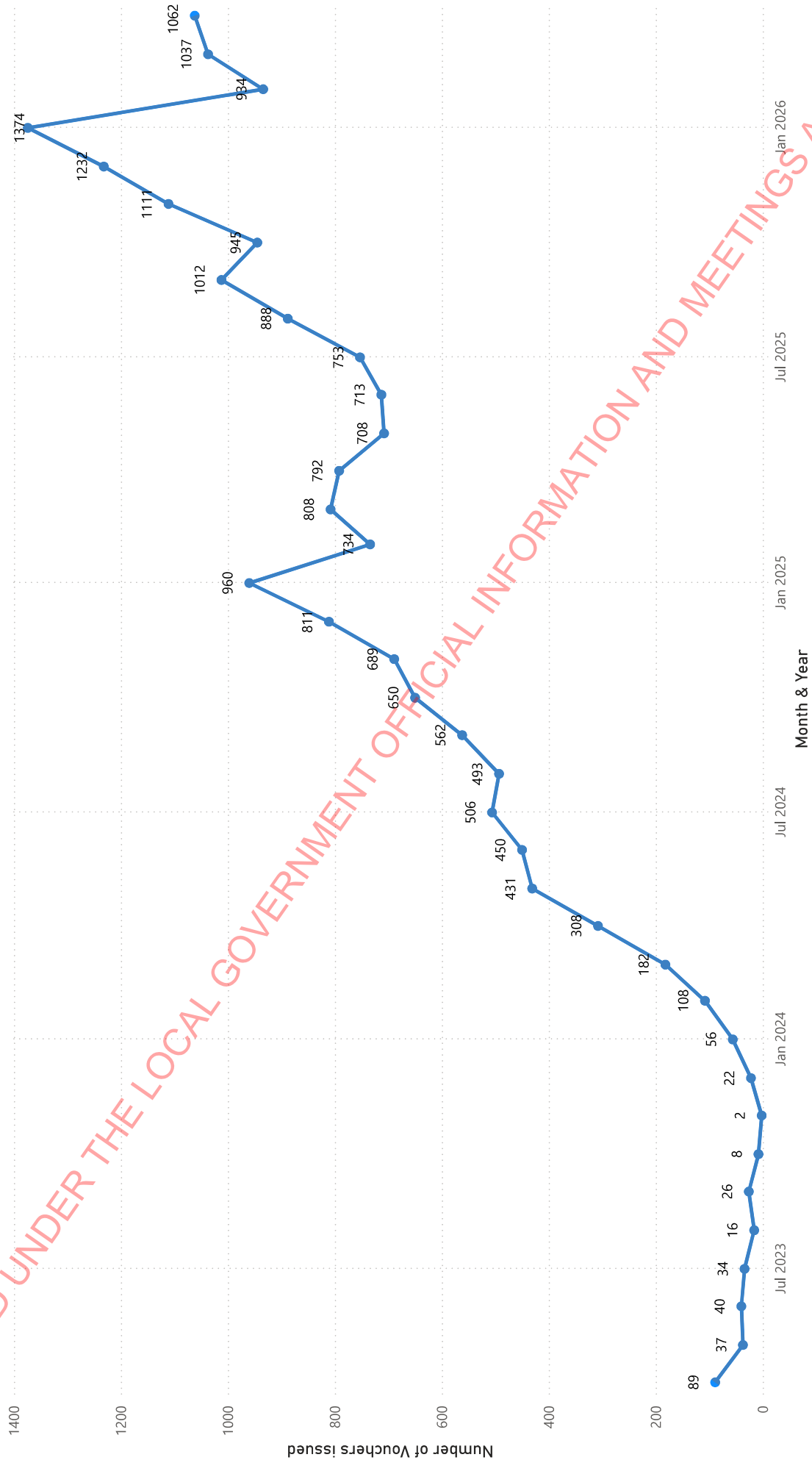
● Earthlink OUT ● Gas Bottles ● Haz OUT ● Oil OUT ● Recyclables OUT ● Scrap Metal OUT ● Count of Batteries OUT ● Whiteware OUT

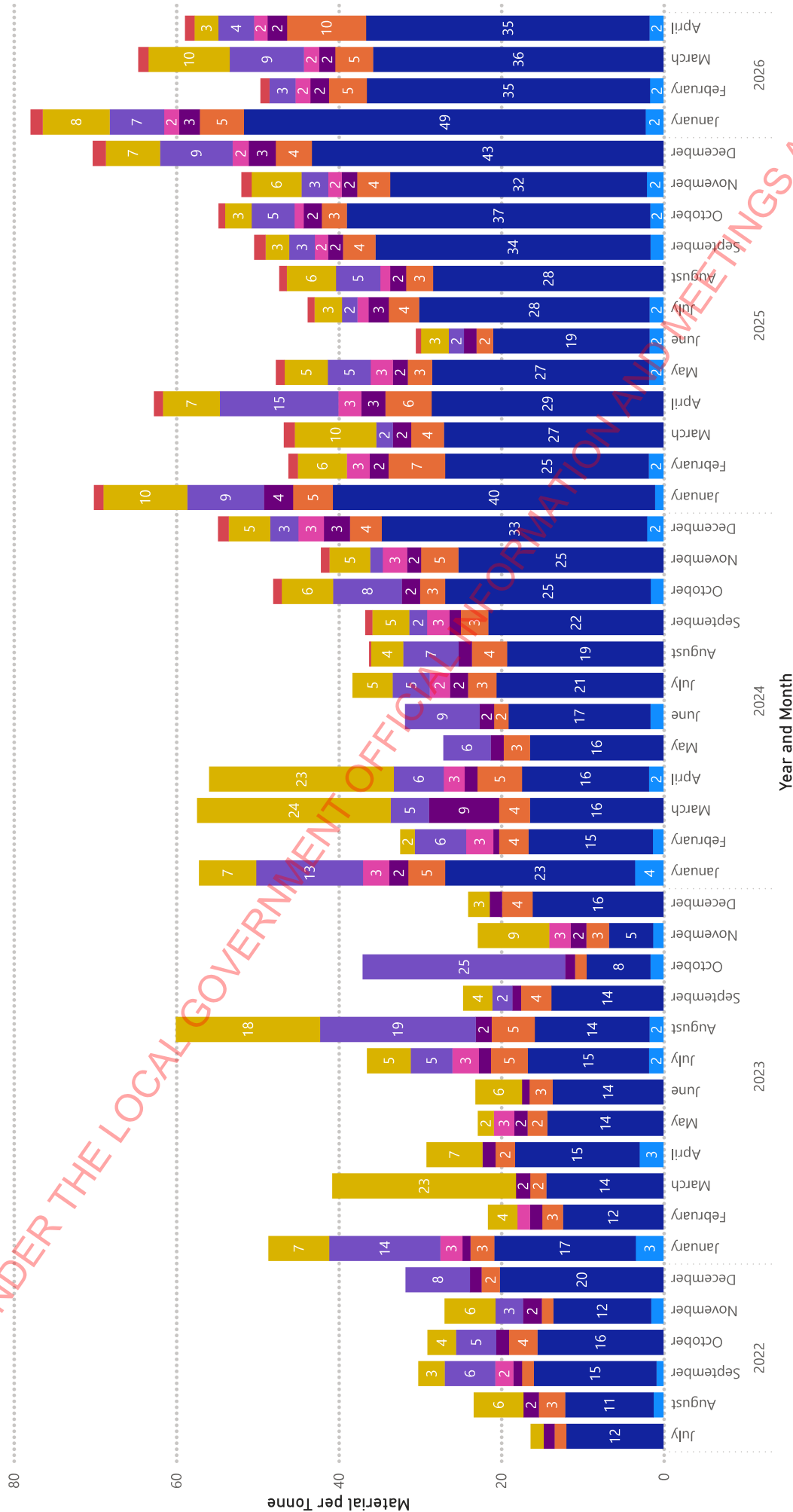


Number of Discount Vouchers Issued: April 2023 - April 2026

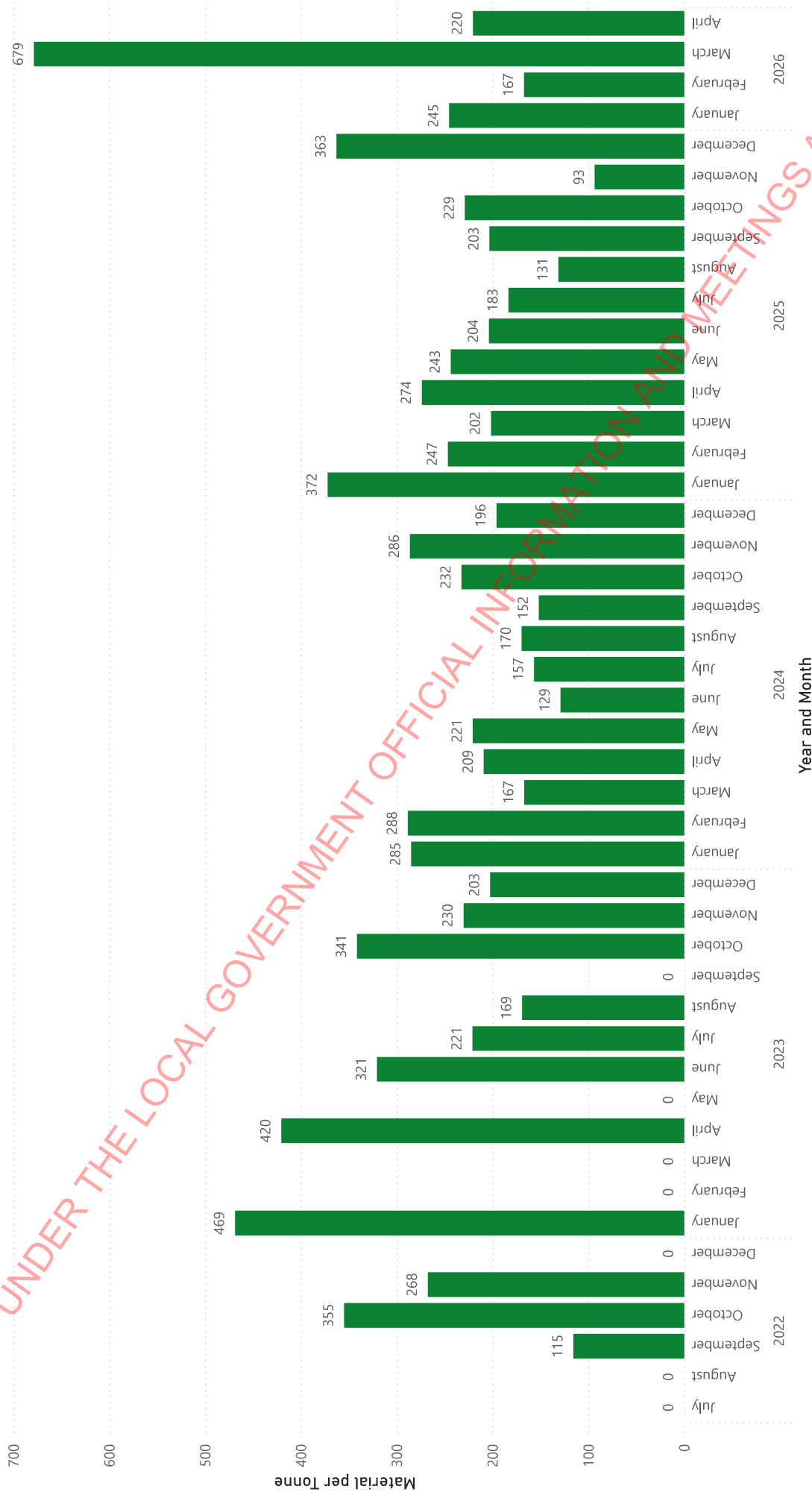


Zero Waste Hub (Silverstream Transfer Station) – Number of vouchers issued (April 2023 – April 2026)

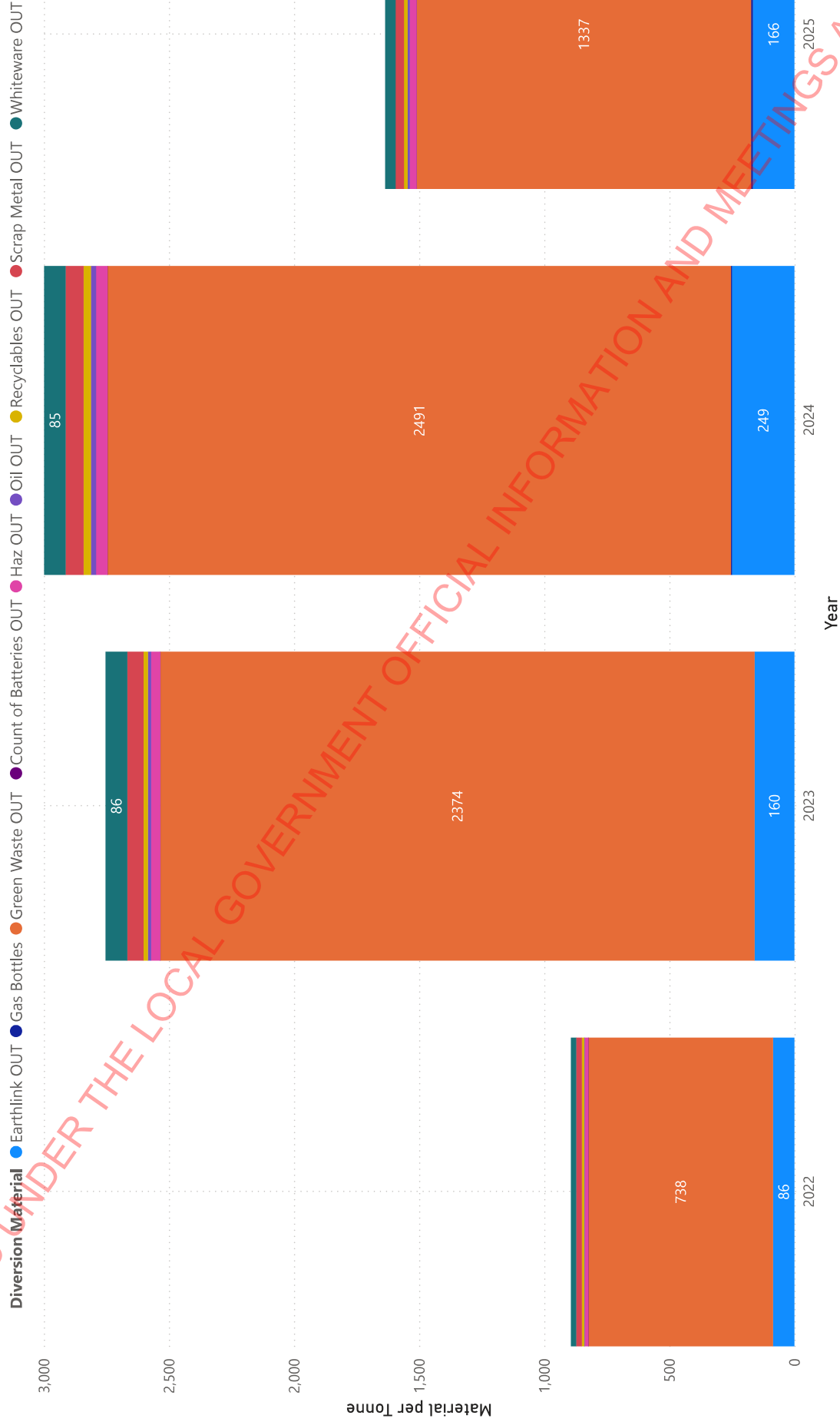




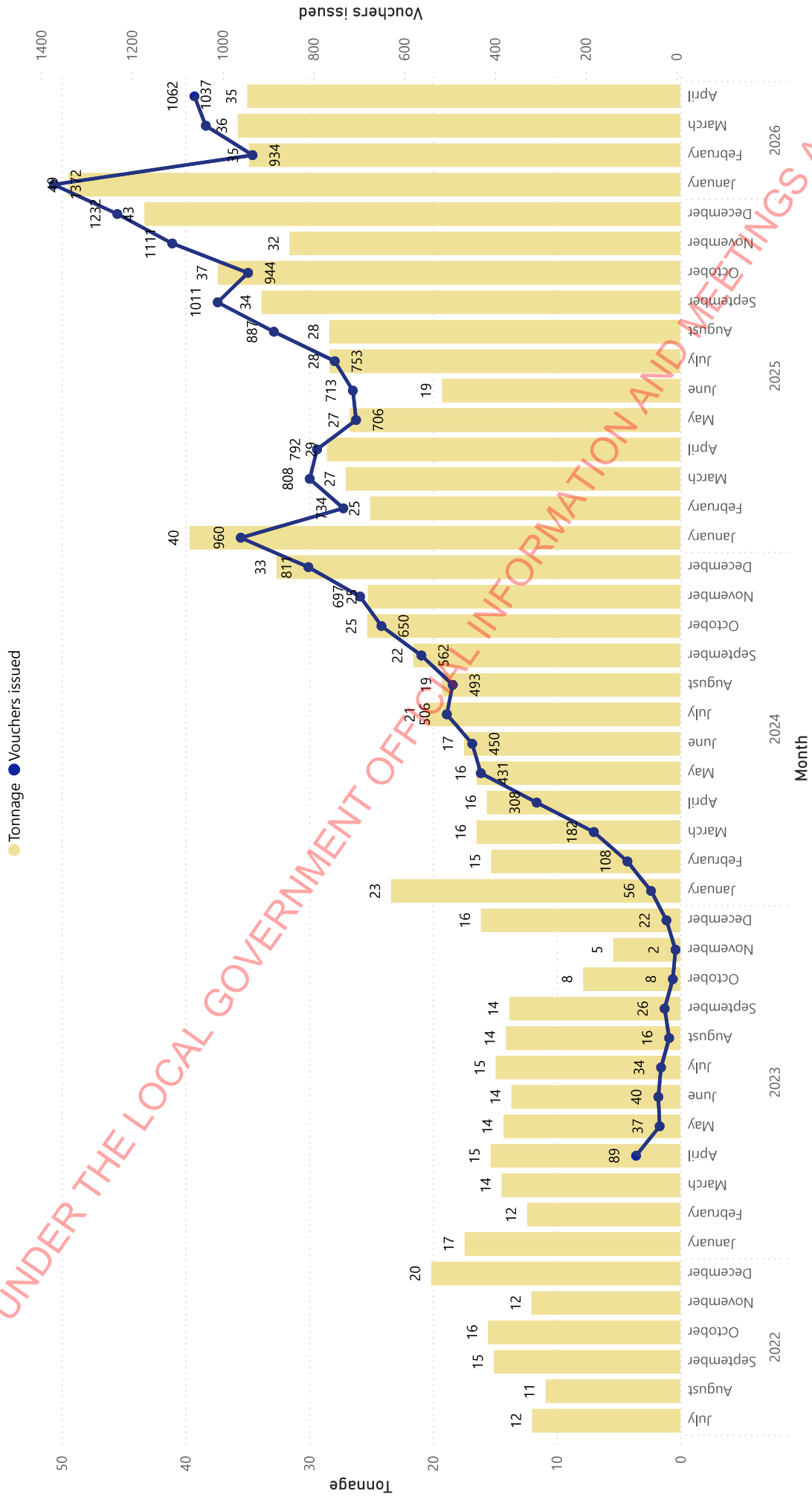
Silverstream Landfill Diversion - Green Waste OUT (July 2022 - April 2026)



Silverstream Landfill Diversion: July 2022 - April 2026

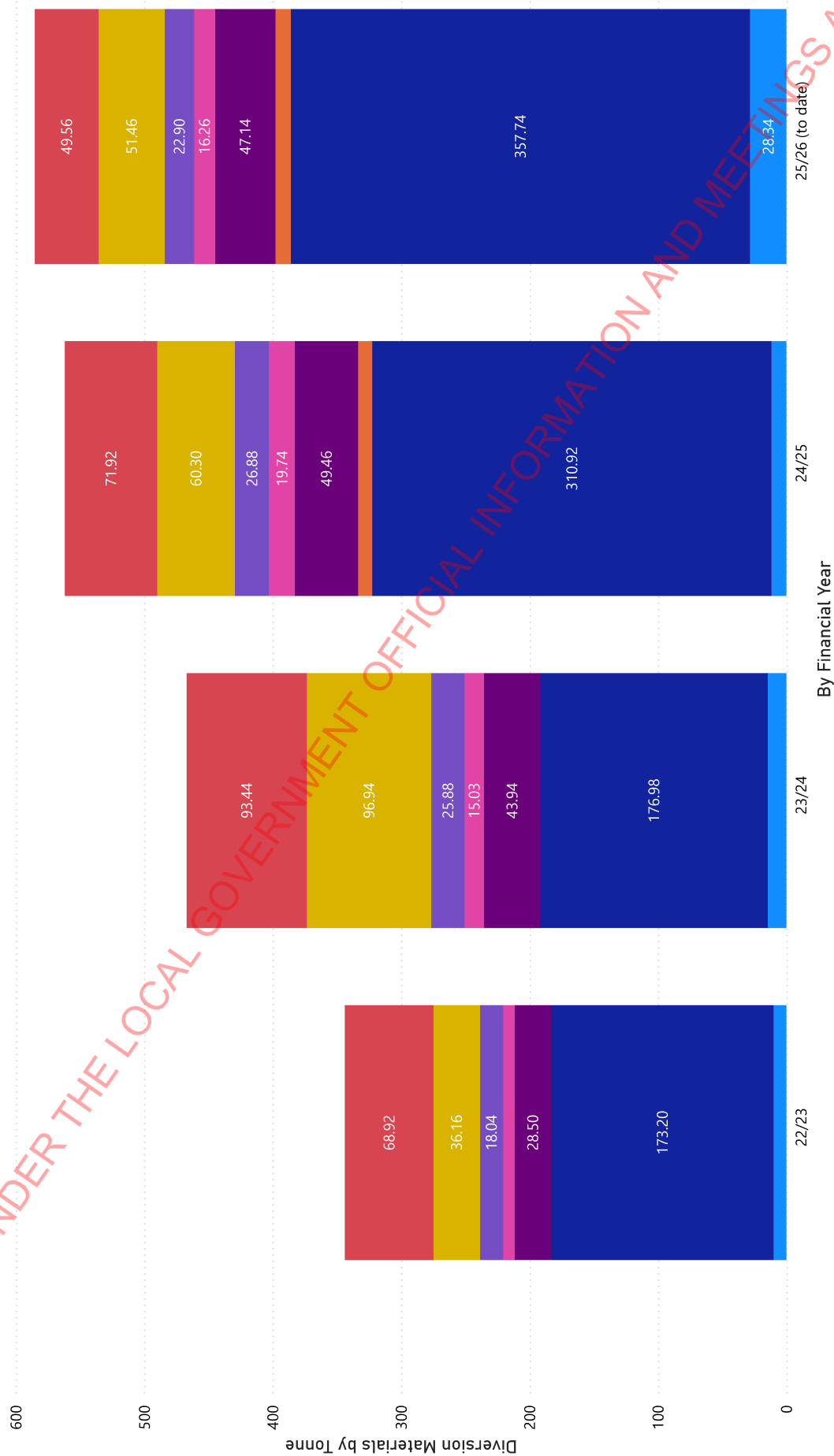


Discount Voucher count and Earthlink OUT diversion tonnage July 2022 - March 2025

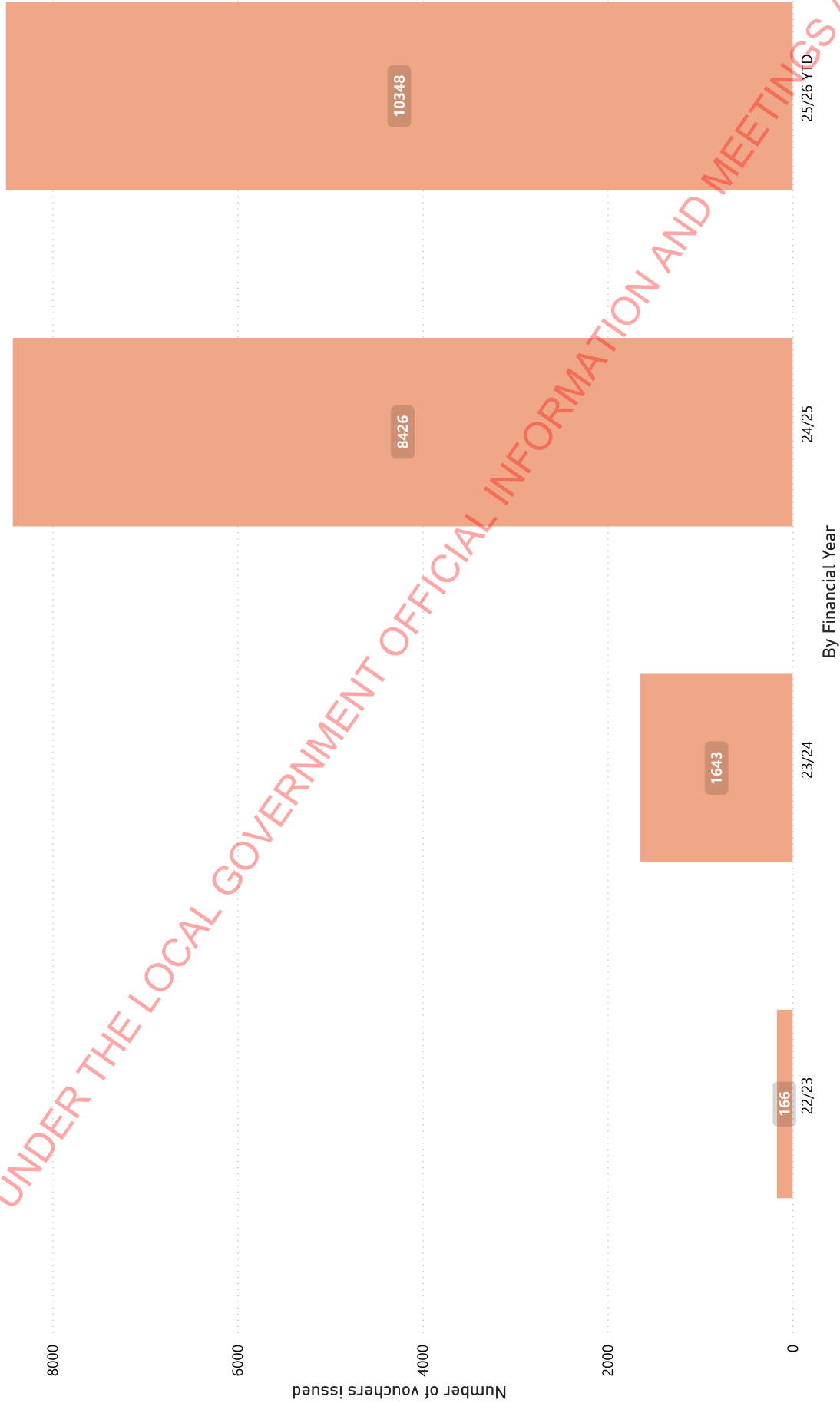


Silverstream Landfill Transfer Station Diversion from Financial Year 22/23 - 25/26 YTD

● Batteries ● Earthlink ● Gas Bottles ● Hazardous ● Oil ● Recyclables ● Scrap Metal ● Whiteware



Number of Discount Vouchers Issued: Financial Year 22/23 - 25/26 YTD



Phoenix battery collections

Data & diversion

Date	Weight collected (kgs)
Oct 2025	73
Nov 2025	89
Dec 2025	84
Mar 2026	104
Apr 2026	31

Hub rollout dates:

Phase 1 Rollout – Wednesday 24th September 2025

1. War Memorial Library
2. Naenae Neighbourhood Hub
3. Eastbourne Neighbourhood Hub

Phase 2 rollout – Thursday 26 March 2026

1. Wainuiomata Neighbourhood hub
2. Walter Nash Centre
3. Laings Road

Phase 3 rollout – Tuesday 14 April 2026

1. Koruanui Stokes Valley Community hub

[illegible]

Darrin Newth
Financial Accounting Manager

Information only item for 24/25 costs regarding kerbside collection for recycling and optional green waste (waste minimisation related, but outside the 7322 cost centre)

[illegible]

-this gets used for TAWLES - from Jo Broad

(5.031,717) <- this is the number - Actual for the ye: This is just kerbside

Note:
extract for "MFE levy funds" from "Transactions GL and PJ 24-25"
for previous years please refer to previous levy reports

Date	Reference	Type	Period	Amount	Source	Notes
22/07/2024 12:00 AM	074974	BANKENTRY		1 -511,749.54	Min for the Enviro Waste Disposal Levy 21/3/24 to 20/06/24 04 22/4/24	GL 2024/2025
21/10/2024 12:00 AM	075622	BANKENTRY		4 -482,420.66	Min for the Enviro Waste Disposal Levy 21/6/24 to 20/09/24 04 21/10/24	GL 2024/2025
17/01/2025 12:00 AM	076407	BANKENTRY		7 -540,785.73	Min for the Enviro Waste Disposal Levy 21/9/24 to 20/12/24 04 17/1/25	GL 2024/2025
17/04/2025 12:00 AM	077281	BANKENTRY		10 -540,211.80	Min for the Enviro Waste Disposal Levy 21/12/24 to 20/03/25 04 17/4/25	GL 2024/2025
						-2,075,167.73

Please note that pages (602 - 603) have been removed from the pack, as they are withheld in full under section 7(2)(b)(ii).

